CHAPTER 23 Nursing Care of Clients with Upper Gastrointestinal Disorders

LEARNING OUTCOMES

- Describe the pathophysiology of common disorders of the mouth, esophagus, and stomach.
- Relate manifestations and diagnostic test results to the pathophysiologic processes involved in upper gastrointestinal disorders.
- Explain interdisciplinary care for clients with upper gastrointestinal disorders.
- Describe the role of the nurse in interdisciplinary care of clients with upper gastrointestinal disorders.

CLINICAL COMPETENCIES

- Assess the functional health status of clients with upper gastrointestinal disorders.
- Monitor, document, and, as needed, report manifestations of upper gastrointestinal disorders and their complications.
- Plan nursing care using evidence-based research.
- Determine priority nursing diagnoses and interventions based on assessed data.
- Administer medications and prescribed care knowledgeably and safely.
- Coordinate and integrate interdisciplinary care into plan of care.
- Construct and revise individualized plans of care considering the culture and values of the client.
- Plan and provide client and family teaching to promote, maintain, and restore functional health.

MEDIALINK

Resources for this chapter can be found on the Prentice Hall Nursing MediaLink DVD-ROM accompanying this textbook, and on the Companion Website at http://www.prenhall.com/lemone

KEY TERMS

achalasia, *668*
acute gastritis, *677*
anorexia, *677*
cachectic, *689*
chronic gastritis, *677*
Curling's ulcers, *677*
Cushing's ulcers, *677*
diffuse esophageal spasm, *668*
dumping syndrome, *689*
duodenal ulcers, *680*
dysphagia, *668*
erosive (stress-induced) gastritis, *677*
esophagojejunostomy, *689*
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Zollinger-Ellison syndrome, *684*

The upper gastrointestinal tract includes the mouth, esophagus, stomach, and proximal small intestine. Food and fluids, ingested through the mouth, move through the esophagus to the stomach. The stomach and upper intestinal tract (duodenum and jejunum) are responsible for the majority of food digestion. When an acute or chronic disease process interferes with the function of this portion of the gastrointestinal (GI) tract, nutritional status can be affected and the client may experience symptoms that interfere with lifestyle.

Nurses provide both acute care for the hospitalized client and teaching about the skills and knowledge needed to manage these conditions at home.

DISORDERS OF THE MOUTH

Inflammations, infections, and neoplastic lesions of the mouth affect food ingestion and nutrition. Oral lesions may have a variety of causes, including infection, mechanical trauma, irritants such as alcohol, and hypersensitivity. Appropriate treatment of the disorder, any underlying factors, and associated symptoms is essential.

THE CLIENT WITH STOMATITIS

Stomatitis, inflammation of the oral mucosa, is a common disorder of the mouth. It may be caused by viral (herpes simplex) or fungal (*Candida albicans*) infections, mechanical trauma (e.g., cheek biting), and irritants such as tobacco or chemotherapeutic agents. Stomatitis is commonly seen in people who are immunocompromised (e.g., clients with HIV disease), people with cancer, frail older adults, and at the end of life (Dahlin, 2004). Box 23–1 lists common risk factors for stomatitis.

FAST FACTS

- Up to 75% of people undergoing chemotherapy to treat cancer experience *oral mucositis,* a type of stomatitis.
- Oral mucositis tends to affect younger clients, women, and people receiving fluorouracil (5FU) more frequently than others.
- Clients who also use alcohol and tobacco have a greater risk of developing oral mucositis.
- 100% of clients undergoing radiation therapy of the head and neck develop oral mucositis.
- Nearly 90% of clients treated with stem cell transplant develop oral mucositis (Cawley & Benson, 2005).

BOX 23–1 Risk Factors for Stomatitis

- Age > 65 years
- Impaired immune status (HIV disease, cancer, diabetes)
- Chronic renal failure or heart failure
- Chemotherapy, radiation therapy, stem cell transplant
- Oxygen therapy, mouth breathing
- Medications (antibiotics, phenytoin, anticholinergics, corticosteroids)
- Poor oral hygiene, ill-fitting dentures
- Tobacco or alcohol use

Pathophysiology and Manifestations

The oral mucosa, which lines the oral cavity, is a relatively thin, fragile layer of stratified squamous epithelial cells. The blood supply to the oral mucosa is rich. As epithelial cells slough, stem cells in the submucosa develop into epithelial cells to replace those that are lost. The health and integrity of the oral mucosa are, therefore, dependent on the ability of stem cells to continuously reproduce (Cawley & Benson, 2005).

Frequent exposure to the environment, a rich blood supply, and the oral mucosa's delicate nature increase the risk of infection or inflammation, reaction to toxins, and trauma. Stomatitis results from persistent damage to oral mucosal cells. Damage is initially superficial, progressing to ulceration and involvement of the entire epithelium. Finally, healing begins within 2 to 4 weeks (Dahlin, 2004).

The pathophysiology of oral mucositis has only recently been fully understood. Radiotherapy and chemotherapy damage the DNA of epithelial cells, resulting in necrosis and death of some cells. This stimulates the release of inflammatory mediators that further damage tissues, causing additional epithelial cells to die. As a result, the oral mucosa thins. Tumor necrosis factor alpha (TNF-α) is released, which activates additional inflammatory cytokines. Tissues below the mucosa are damaged as well. In the ulcerative stage of oral mucositis, irregular ulcers that extend from the epithelium into the submucosa develop. As nerve endings are exposed, this stage is accompanied by significant pain. Although healing begins within 2 to 3 weeks, the oral mucosa does not fully recover, and remains vulnerable to damage or inflammation (Cawley & Benson, 2005).

The clinical manifestations of stomatitis vary according to its cause. Table 23–1 outlines common causes of stomatitis with their manifestations and treatment. Chemotherapy or chemical irritation may result in initial generalized redness and swelling, followed by development of deep, irregular ulcerations. Ulcers may be covered with pseudomembranes. Oral pain and pseudomembranes can interfere with the ability to eat, drink, and swallow normally (Cawley & Benson, 2005).

Stomatitis can lead to malnutrition, fluid and electrolyte imbalance, and other complications such as sepsis and bacterial endocarditis.

INTERDISCIPLINARY CARE

Stomatitis is diagnosed by direct physical examination and, if indicated, cultures, smears, and evaluation for systemic illness. Treatment addresses both the underlying cause and any coexisting illnesses. An undiagnosed oral lesion present for more than 1 week and that does not respond to therapy must be evaluated for malignancy.

Direct smears and cultures of lesions may be obtained to identify causative organisms. If systemic illness is suspected, a variety of diagnostic tests may be ordered to identify the underlying cause.

General treatment measures include providing meticulous oral hygiene, with brushing and flossing (as tolerated). A solution of saline, sodium bicarbonate, or a combination of saline/bicarbonate promotes comfort and healing when used after and between meals.

Medications

Using a topical anesthetic, such as 2% viscous lidocaine, diphenhydramine (Benadryl) solution, or benzocaine spray or gel can promote comfort and the ability to consume oral food and fluids. Lidocaine solution is not swallowed to avoid impairment of the swallowing mechanism. Orabase, a protective paste, may be applied to oral ulcers to promote comfort. Triamcinolone acetonide

TABLE 23–1 **Manifestations and Treatment of Common Stomatitis Conditions**

TYPE	CAUSE	MANIFESTATIONS	TREATMENT
Cold sore, fever blister	Herpes simplex virus	■ Initial burning at site ■ Clustered vesicular lesions on lip or oral mucosa	■ Self-limiting ■ Acyclovir, valacyclovir to shorten course
Aphthous ulcer (canker sore, ulcerative stomatitis)	Unknown; may be type of herpes virus	■ Well-circumscribed, shallow erosions with white or yellow center encircled by red ring ■ Less than 1 cm in diameter ■ Painful	■ Topical steroid ointment ■ Amlexanox oral paste (Aphthasol) ■ Oral prednisone
Candidiasis (thrush)	*Candida albicans*	■ Creamy white, curdlike patches ■ Red, erythematous mucosa	■ Fluconazole (Diflucan) ■ Ketoconazole (Nizoral) ■ Clotrimazole troches ■ Nystatin vaginal troches (dissolved orally) or mouth rinse
Necrotizing ulcerative gingivitis (trench mouth, Vincent's infection)	Infection with spirochetes and bacilli or systemic infection	■ Acute gingival inflammation and necrosis ■ Bleeding, halitosis ■ Fever ■ Cervical lymphadenopathy	■ Correct any underlying disorders ■ Warm, half-strength peroxide mouthwashes ■ Oral penicillin
Oral mucositis	Damage to epithelial cells and stem cells in the submucosa caused by chemotherapy or radiation therapy	■ Erythema and inflammation of oral mucosa ■ Painful, irregularly shaped ulcerations, initially superficial, progressing to deep ulcers that may be confluent (overlapping with one another) ■ Pseudomembranes covering ulcers ■ Tissue necrosis with spontaneous bleeding, potential sepsis	■ Regular oral hygiene with brushing and flossing ■ Saline or sodium bicarbonate solution mouth rinses after and between meals ■ Gelclair mouth rinse before meals for analgesia ■ Palifermin, an epithelial cell growth factor ■ Low-level laser therapy

may be mixed in Orabase to reduce inflammation and promote healing. Other coating agents include Amphojel or Kaopectate. Sodium bicarbonate mouthwashes may provide relief and promote cleansing, whereas alcohol-based mouthwashes may cause pain and burning and should be avoided. Agents that form a film over exposed nerve endings and deep ulcerations (e.g., Zilactin, Gelclair) may be used in clients with oral mucositis.

Fungal infections often are treated with a nystatin oral suspension; clients "swish and swallow" the solution. Clotrimazole lozenges also treat oral fungal infections. If the infection does not resolve, oral antifungal medications such as fluconazole or ketoconazole may be used. Antifungals are usually continued for at least 3 days after symptoms disappear.

Herpetic lesions may be treated with topical or oral acyclovir or valacyclovir (Valtrex). Acyclovir ointment provides comfort and lubrication while limiting the spread of the virus. Acyclovir capsules reduce the severity of symptoms and the duration of the lesions.

Bacterial infections are treated with antibiotics based on cultures and smears. Oral penicillin is the treatment of choice if the client is not allergic and the cultured bacteria are sensitive. Nursing implications for selected drugs used to treat stomatitis are outlined below.

An epithelial cell growth-stimulating factor, Palifermin, has been approved to reduce the incidence and duration of oral mucositis in clients undergoing high-dose chemotherapy with or without radiation therapy in preparation for bone marrow or stem cell transplant (National Cancer Institute, 2005). See the Medication Administration box below.

NURSING CARE

Health Promotion

Nurses can help prevent stomatitis by identifying clients at risk and suggesting measures to reduce the likelihood that stomatitis will develop. Teach and encourage all clients to regularly perform mouth care, including teeth brushing and flossing. Provide frequent mouth care with nondrying agents for clients who are unable to provide self-care. Encourage clients with ill-fitting dentures or other dental prostheses (such as partial plates) to see a qualified dentist or denturist. Suggest clients taking an extended course of antibiotic therapy or who have impaired immune function consume 8 oz. of yogurt containing live bacterial cultures or 8 oz of buttermilk daily unless contraindicated. Discuss dietary modifications, such as limiting consumption of highly spiced or acidic foods and avoiding very hot beverages. Clients undergoing chemotherapy or radiation therapy should avoid use of alcohol and tobacco because these substances further damage oral mucosa, increasing the risk for oral mucositis.

Assessment

Oral assessment is important not only for clients who have been diagnosed with stomatitis, but also for those with risk factors,

MEDICATION ADMINISTRATION **Drugs Used to Treat Stomatitis**

TOPICAL ORAL ANESTHETICS

Orajel
Viscous lidocaine
Anbesol
Triamcinolone acetonide

These drugs reduce the pain associated with mucous membrane lesions or stomatitis. They provide temporary relief of pain. Any oral lesion that persists longer than 1 week should be evaluated by an oral surgeon.

Nursing Responsibilities

- Instruct the client to seek medical attention for any oral lesion that does not heal within 1 week.
- Monitor for local hypersensitivity reactions, and discontinue use if they occur.

Health Education for the Client and Family

- Apply every 1 to 2 hours as needed.
- Perform oral hygiene after meals and at bedtime.

TOPICAL ANTIFUNGAL AGENTS

Clotrimazole
Nystatin

These products help in the topical treatment of candidiasis. Their effects are primarily local rather than systemic.

Nursing Responsibilities

- Instruct the client to dissolve lozenges in the mouth.
- Instruct the client to rinse mouth with oral suspension for at least 2 minutes and expectorate or swallow as directed.
- These drugs are contraindicated in pregnancy.

Health Education for the Client and Family

- Take medication as prescribed.
- Do not eat or drink 30 minutes after medication.
- Contact physician if symptoms worsen.
- Perform good oral hygiene after meals and at bedtime; remove dentures at bedtime.

ANTIVIRAL AGENTS

Acyclovir (Zovirax)
Valacyclovir (Valtrex)

Acyclovir and valacyclovir are useful in the treatment of oral herpes simplex virus. They help reduce the severity and frequency of infections. These antiviral agents interfere with the DNA synthesis of herpes simplex virus.

Nursing Responsibilities

- Start therapy as soon as herpetic lesions are noted.
- Administer with food or on an empty stomach.

Health Education for the Client and Family

- The virus remains latent and can recur during stressful events, fever, trauma, sunlight exposure, and treatment with immunosuppressive drugs.
- Take the medication as ordered, and contact the physician if symptoms worsen.

manifestations, or evidence of possible complications (e.g., recent weight loss).

- *Health history:* Complaints of mouth pain, altered taste, lack of appetite, malaise; presence of dentures, regularity of dental care; current health status including chronic diseases; current medications; use of alcohol or tobacco.
- *Physical examination:* Inspect lips, gums, teeth, interior cheeks, tongue and base of tongue, soft and hard palate; tonsils, and oral pharynx. Observe and assess general health status including temperature, weight.
- *Diagnostic tests:* WBC, sedimentation rate, serum albumin.

Nursing Diagnoses and Interventions

Nursing care for the client with stomatitis or oral mucositis focuses not only on the oral inflammation, but also on any underlying systemic diseases and the effects of the condition on the client's comfort and nutrition.

Impaired Oral Mucous Membrane

Stomatitis and oral mucositis disrupt the integrity of the oral mucous membrane. Regardless of cause, the pain and symptoms must be relieved to promote comfort as well as food and fluid intake.

- Assess and document oral mucous membranes and the character of any lesions every 4 to 8 hours. *Baseline and ongoing assessment data provide the basis for evaluation.*
- Assist with thorough mouth care after meals, at bedtime, and every 2 to 4 hours while awake. If unable to tolerate a toothbrush, offer sponge or gauze toothettes. Avoid using alcohol-based mouthwashes or lemon-glycerin swabs. Provide saline or sodium bicarbonate rinse or a combined saline/sodium bicarbonate rinse after every meal and between meals. *Mouth care promotes hygiene, comfort, and healing. Alcohol-based mouthwashes and lemon-glycerin swabs may dry and irritate mucous membranes, causing pain and further tissue damage, whereas saline or bicarbonate rinses promote comfort and healing (Cawley & Benson, 2005).*
- Assess knowledge and teach about condition, mouth care, and treatments. Instruct to avoid alcohol, tobacco, and spicy or irritating foods. *Knowledge promotes client participation in the plan of care and compliance. Alcohol, tobacco, and hot, spicy, or rough foods may injure the inflamed mucous membranes.*

Imbalanced Nutrition: Less than Body Requirements

Oral lesions and pain may limit oral intake, which may in turn lead to nutritional deficits. Anorexia and general malaise may also contribute to decreased intake.

- Assess food intake as well as the client's ability to chew and swallow. Weigh daily. Provide appropriate assistive devices such as straws or feeding syringes. *Adequate nutrition is essential for healing. Daily weights allow monitoring of the adequacy of food intake. Assistive devices may allow food intake while avoiding irritation of ulcerations or lesions.*
- Encourage a high-calorie, high-protein diet considerate of food preferences. Offer soft, lukewarm, or cool foods or liquids such as eggnogs, milk shakes, nutritional supplements, popsicles, and puddings frequently in small amounts. Obtain nutritional consultation. *Oral intake may be limited, and enriched foods and liquids enhance nutrition. A nutritional consultation can help ensure an adequate diet and assist in meeting nutritional needs.*
- Provide analgesics for pain relief as needed. *Significant pain associated with stomatitis or oral mucositis can interfere with effective mouth care and food and fluid intake. Pain management is a vital part of nursing care.*

Using NANDA, NIC, and NOC

Chart 23–1 shows links between NANDA nursing diagnoses, NIC, and NOC when caring for the client with stomatitis.

Community-Based Care

Clients with mild stomatitis generally provide self-care. While clients with cancer treatment–related oral mucositis may require more aggressive therapy, the client and caregivers often are able to manage the regimen in home or community-based settings. Include the following topics in teaching for home care:

- Managing any underlying health conditions and ongoing treatments such as chemotherapy
- The recommended diet and oral hygiene regime, including foods and substances (e.g., alcohol, tobacco products) to avoid
- Nutritional supplements to help meet nutritional requirements
- Prescribed medication, its route, side effects, frequency of administration, and signs and symptoms to report

NANDA, NIC, AND NOC LINKAGES

CHART 23–1 The Client with Stomatitis

NANDA

Impaired Oral Mucous Membrane

↓

NIC

Oral Health Restoration

Pain Management

Nutrition Management

Fluid Monitoring

↓

NOC

Oral Health

Self-Care: Oral Hygiene

Pain Control

Nutritional Status: Food and Fluid Intake

Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Maas (2004), St. Louis, MO: Mosby.

- The importance of completing the full course of antibiotic, antiviral, or antifungal treatment
- Manifestations to report and the importance of follow-up care.

THE CLIENT WITH ORAL CANCER

Oral cancer, malignancy of the oral mucosa, may develop on the lips, tongue, floor of the mouth, or other oral tissues. It is uncommon, accounting for only 5% of all cancers. It has, however, a high rate of morbidity and mortality. The incidence of this type of head and neck cancer is twice as high in men as in women, and it is seen more often in men over age 40. The stage of an oral cancer determines the prognosis, treatment, and degree of disability. The primary risk factors for oral cancer are smoking, drinking alcohol, and chewing tobacco. Marijuana use, occupational exposures to chemicals, and viruses such as human papilloma virus (HPV) also may contribute to the risk for oral cancer.

Pathophysiology and Manifestations

Oral cancer is usually a squamous cell carcinoma. Although a cancerous lesion can develop in any area of the mouth, the most common sites are the lower lip, tongue, and floor of the mouth. Most early cancers present as inflamed areas with irregular, ill-defined borders. These lesions typically are not painful. More advanced cancers appear as deep ulcers that are fixed to deeper tissues. Early lesions involve the mucosa or submucosa, whereas more advanced tumors may invade and destroy underlying tissues, including muscles and bones of the face. Tumors frequently metastasize to regional lymph nodes. Other cancerous lesions, including lymphoma, malignant melanoma, and Kaposi's sarcoma, also may develop in the mouth, although less frequently than squamous cell carcinoma.

The earliest symptom of oral cancer is a painless oral ulceration or lesion (Figure 23–1 ■). Later symptoms vary and may include difficulty speaking, swallowing, or chewing; swollen lymph nodes; and blood-tinged sputum. See the accompanying box for other manifestations of oral cancer. Any oral lesion that does not heal or respond to treatment within 1 to 2 weeks should be evaluated for malignancy.

Figure 23–1 ■ Oral cancer.
Source: Biophoto Associates/Photo Researchers, Inc.

MANIFESTATIONS of Oral Cancer

- White patches (leukoplakia)
- Red patches (erythroplakia)
- Ulcers
- Masses
- Pigmented areas (brownish or black)
- Fissures
- Asymmetry of the head, face, jaws, or neck

INTERDISCIPLINARY CARE

The first component of treatment is eliminating any causative factors such as chewing tobacco, smoking, or drinking alcohol. Tumor staging then determines therapy. The TNM (tumor, nodes, metastasis) classification is used to stage oral cancer. See Box 23–2. A biopsy of the oral lesion allows direct visualization of cells to determine the presence or absence of cancerous cells. Staging may require additional diagnostic studies such as computed tomography (CT) scans or magnetic resonance imaging (MRI).

Radiation and chemotherapy may be considered based on the client's age, tumor stage, general condition, and preferences. Radiation therapy may be used preoperatively to "shrink" the tumor or postoperatively to limit the risks of metastasis. Chemotherapy may be indicated depending on the stage of the tumor. See Chapter 14 ∞ for more information about radiation and chemotherapy to treat cancer.

Following the biopsy and staging of the tumor, surgery is generally indicated, although an advanced or extensive tumor may be considered unresectable. If the tumor involves surrounding tissues, the cosmetic effects of surgery are important considerations. The goal of surgery is removal of the lesion and potentially cancerous surrounding tissue or lymph nodes. Advanced carcinomas may require extensive excision or a *radical neck dissection,* a potentially disfiguring procedure in which the lymph nodes and muscles of the neck are removed. A tracheostomy is performed at the time of surgery. The tracheostomy may be temporary, but often is permanent. See Chapter 37 ∞ for more information about caring for a client following radical neck dissection and a tracheostomy.

BOX 23–2 Oral Cancer Staging

Stage 0	Carcinoma *in situ*
Stage I	Tumor ≤ 2 cm; no regional node involvement
Stage II	Tumor > 2 cm to ≤ 4 cm; no regional node involvement
Stage III	Tumor ≤ 2 cm to > 4 cm; one involved lymph node
Stage IVA & B	Tumor may invade adjacent structures; one or more nodes involved
Stage IVC	Distant metastasis present

NURSING CARE

Health Promotion

Reducing or eliminating tobacco use (smoking and smokeless tobacco) and excess alcohol consumption can significantly reduce the incidence of oral cancer. Teach children and adolescents about the dangers of using tobacco and alcohol. Emphasize the relationship between smokeless tobacco and oral cancer. Discuss strategies to deal with peer pressure to use tobacco and alcohol.

To promote early identification of and intervention for oral cancer, teach clients about the risk factors for and manifestations of the disease. This is a particularly important nursing strategy in older men who have the highest incidence, and in populations in whom the disease often is advanced when detected (people of lower socioeconomic status, people who rarely see a dentist, and African American men) (Powe & Finnie, 2004).

Assessment

Early precancerous oral lesions are very treatable. Unfortunately, these lesions usually are painless, so diagnosis and treatment often is delayed. Assess the oral cavity of all clients, particularly those with risk factors for oral cancer.

- *Health history:* Complaints of oral lesions that fail to heal; use (current or past) of tobacco products or excess alcohol.
- *Physical examination:* Inspect and palpate lips and oral mucosa (including tongue and floor of mouth under the tongue) for tumors or lesions. Lesions may appear as velvety red or white patches that do not scrape off, or as ulcers or areas of necrosis.

Nursing Diagnoses and Interventions

The mouth allows food ingestion, and the lips are integral to verbal and nonverbal expression. The head, mouth, and lips are important to self-perception and body image. Nursing diagnoses discussed in this section consider such problems as airway clearance, nutrition, communication, and body image. See the accompanying Nursing Care Plan below.

NURSING CARE PLAN **A Client with Oral Cancer**

Juan Chavez, a married 44-year-old farmer, has two adult children. He and his wife raise and sell fruits and vegetables. Two months ago, Mr. Chavez developed a sore on his tongue that would not heal. Mr. Chavez tells his admission nurse, Sara Bucklin, "The doctor says he will have to remove part of my tongue," and anxiously asks, "Will I ever look the same? How will I be able to talk?"

ASSESSMENT

Mr. Chavez's admission history reveals that he has been healthy, but has smoked two packs of cigarettes a day for more than 20 years, and usually drinks two to four beers per day. He admits to being anxious and fearful of surgery and its outcomes. He says he quit smoking and drinking 2 weeks ago. The biopsy report is positive for squamous cell carcinoma of the tongue. Mr. Chavez has no enlarged cervical nodes and says he has no bloody sputum or saliva, difficulty swallowing, chewing, or talking. His weight is in the normal range for his height. A wide excision of the oral lesion is planned.

DIAGNOSES

- *Risk for Ineffective Airway Clearance* related to oral surgery
- *Risk for Imbalanced Nutrition: Less than Body Requirements* related to oral surgery
- *Impaired Verbal Communication* related to excision of a portion of the tongue
- *Disturbed Body Image* related to surgical excision of the tongue

EXPECTED OUTCOMES

- Maintain a patent airway and remain free of respiratory distress.
- Maintain a stable weight and level of hydration.
- Effectively communicate with staff and family using a magic slate and flash cards.
- Communicate an increased ability to accept changes in body image.

PLANNING AND IMPLEMENTATION

- Assess airway patency and respiratory status every hour until stable.
- Maintain semi-Fowler's position, supporting arms. Encourage to turn, cough, and deep breathe every 2 to 4 hours.
- Teach the importance of activity, turning, coughing, and deep breathing.
- Monitor daily weights.
- Consult with dietitian to assess calorie needs and plan appropriate enteral feeding. Assess response to enteral feedings.
- Demonstrate and allow to practice using magic slate and flash cards prior to surgery.
- Allow adequate time for communication efforts.
- Keep emergency call system in reach at all times and answer light promptly. Alert all staff of inability to respond verbally.
- Encourage expression of feelings regarding perceived and actual changes.
- Provide emotional support and encourage self-care and participation in decision making.

EVALUATION

At the time of discharge, Mr. Chavez has maintained his weight and has started on oral liquids, including supplements and enriched liquids. His airway has remained clear, and he is effectively coughing and deep breathing. He has used the magic slate to communicate throughout his hospital stay. He is regaining use of his tongue, and can speak a few words. Although initially distressed, he is communicating an increased ability to cope with loss of part of his tongue. He and his wife say they understand his discharge instructions, including diet, activity, follow-up care, and signs and symptoms to report.

CRITICAL THINKING IN THE NURSING PROCESS

1. What measures can you, as a nurse, implement to reduce the incidence of oral cancer?
2. Plan a health education program for young athletes who chew tobacco.
3. Mr. Chavez's wife calls you 2 weeks after discharge. She tells you that he refuses to try to talk and is relying on his magic slate to communicate. How will you respond?
   See Evaluating Your Response in Appendix C.

Risk for Ineffective Airway Clearance

The location and the extent of an oral cancer and its excision may compromise the airway. Swelling of adjacent tissues, increased oral secretions, or difficulty swallowing may contribute to respiratory distress. If extensive surgery is performed, a tracheostomy usually is performed to maintain airway patency.

PRACTICE ALERT

In the initial postoperative period, assess airway patency and respiratory status at least hourly. A patent airway is vital to maintain respirations and oxygenation of tissues. Frequent assessment allows early identification of possible airway compromise.

- Unless contraindicated, place in Fowler's position, supporting arms. Assist the client to turn, cough, and deep breathe at least every 2 to 4 hours. *Fowler's position promotes lung expansion. Turning, coughing, and deep breathing help maintain a patent airway by preventing pooling of secretions.*
- Maintain adequate hydration (2000 to 3000 mL per day unless contraindicated) and humidity of inspired air. *Adequate hydration helps thin and loosen secretions.*

Imbalanced Nutrition: Less than Body Requirements

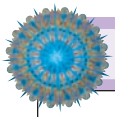
Surgery affects oral food and fluid intake. Enteral feedings or total parenteral nutrition may be required. A gastrostomy tube usually is inserted during surgery to maintain nutrition. If an oral diet is permitted, anorexia or pain may affect intake.

- Weigh daily. Assess oral intake for adequacy of protein, calories, and nutrients. *Daily weights and nutritional assessments provide information about the adequacy of diet.*
- Offer soft, bland foods with supplements as indicated. Provide small, frequent feedings, making mealtimes pleasant. *Soft, bland foods may be better tolerated following oral surgery. Large meals may be overwhelming; small, frequent meals promote food and nutrient intake.*
- Provide enteral feedings per gastrostomy tube as ordered. Elevate the head of the bed 30 to 40 degrees. *Enteral feedings maintain nutritional status in the client who is unable to consume foods orally. Elevating the head of the bed reduces the risk of regurgitation and aspiration of gastric contents.*
- Assess for gastric residual volume per facility protocol for the type of feeding (intermittent or continuous). See the Nursing Research box below. Notify the physician of volumes greater than 200 mL or 50% of previous feeding if feeding is intermittent. *Excess residual volume may increase the risk for aspiration.*
- Consider a nutritional consultation to assess diet and plan appropriate supplements. *A registered dietitian can calculate energy requirements and develop an individualized diet plan to meet nutritional requirements.*

Impaired Verbal Communication

Oral surgery can interfere with communication. Effective communication is vital to postoperative recovery and prevention of complications.

- Before surgery, establish and practice a communication plan such as using a magic slate or flash cards. *Practicing communication techniques reduces fear and anxiety while promoting communication.*



NURSING RESEARCH Evidence-Based Practice for Clients with Enteral Feeding Tubes

Practices and protocols for assessing gastric residual volume in clients with nasogastric or gastrostomy feeding tubes are inconsistent. Researchers have come to varying conclusions about the amount of gastric residual volume that is safe and does not increase gastric distention and the risk for aspiration. In one study, while more than 30% of the clients had residual volumes greater than 150 mL, only 4% had evidence of formula in their airways. In an extensive review of the literature regarding measurement of gastric residual volume, Edwards and Metheny (2000) also found that nursing practice often was inconsistent with hospital protocols. These researchers, together with Schallom (Metheny et al., 2004), went on to study the effect of feeding site on the risk for aspiration. This literature review led to the conclusion that despite differences in feeding tube location (stomach, duodenum, jejunum), evaluation of gastric emptying through measurement of gastric residual volume is the preferred predictor of risk for aspiration in clients with feeding tubes.

IMPLICATIONS FOR NURSING

Gastric motility slows following surgery or trauma, in diabetes, sepsis, or electrolyte imbalance, and with medications such as narcotic analgesics. Excessive gastric distention appears to increase the risk for aspiration of gastric contents. However, when enteral feedings are withheld unnecessarily, the nutritional status of the client is at risk. Impaired nutrition affects healing and recovery.

The authors suggest a protocol for enteral infusions that includes (1) checking residual volume every 4 hours; (2) assessing the client and contacting the physician if the residual volume is greater than 200 mL or 50% of the previous bolus feeding; and (3) withholding the feeding only when directed to do so by the physician (Edwards & Metheny, 2000, Metheny et al., 2004).

CRITICAL THINKING IN CLIENT CARE

1. What factors might influence the accuracy of residual volume measurements? What measures can be taken to obtain accurate measurements?
2. What would be the effect of withholding one bolus feeding of 240 mL of a standard enteral formula? If this is repeated daily for a week, what is the cumulative effect?
3. One reason frequently cited for avoiding checking residual volume is the risk of plugging the feeding tube. Identify measures to prevent this potential problem.

- Provide ample time for communication efforts and do not answer for the client. Be alert for nonverbal communications. Use yes/no questions and simple phrases. *Providing adequate time allows the client opportunity to express ideas and thoughts. Nonverbal communication provides cues regarding comfort or other needs. Simple yes/no questions are easily answered nonverbally.*
- If indicated, refer to or consult with a speech therapist. *A speech therapist can help promote or restore effective communication.*

PRACTICE ALERT

Provide an emergency call system and respond promptly. Make all staff aware that the client cannot respond over an intercom system by posting an alert on the intercom. Nonverbal clients rely on an emergency call system to summon help. Answering promptly reduces fear and anxiety and maintains safety.

Disturbed Body Image

Radical surgery of the head or neck seriously affects body image. An altered speech pattern and any disfigurement affect the ability to feel attractive or effective in work or social roles. Clients may defer lifesaving surgery to postpone disfiguring interventions or therapies.

- Assess coping style, self-perception, and responses to altered appearance or function. *This information can be used to identify appropriate interventions and care.*
- Encourage verbalization of feelings regarding perceived and actual changes. *Nonjudgmental acceptance of feelings and fears helps establish trust.*
- Provide emotional support, encourage self-care, and provide decision-making opportunities. *Self-care promotes self-acceptance and independence. Giving choices empowers the client to participate in care.*

Community-Based Care

Discharge planning for the client with oral cancer depends on the type of treatment planned and surgery performed. Depending on the client's age, condition, and availability of support systems, referral to community healthcare agencies may be an essential component of care. Visits from home care nurses can assist in meeting healthcare needs.

Discuss the following topics with the client and family members or care providers:

- Diagnosis and prescribed care
- Monitoring for new lesions or recurrences
- Diet, nutrition, and activity
- Pain management
- Airway management, care of incision, and signs and symptoms to report.

DISORDERS OF THE ESOPHAGUS

The esophagus plays an essential role in the ingestion of food and liquids. Disorders of the esophagus can be inflammatory, mechanical, or cancerous. Because of its location and neighboring organs, the symptoms of esophageal disorders may mimic those of a variety of other illnesses.

THE CLIENT WITH GASTROESOPHAGEAL REFLUX DISEASE

Gastroesophageal reflux is the backward flowing of gastric contents into the esophagus. When this occurs, the client experiences heartburn. Many people with gastroesophageal reflux have few symptoms, while others develop inflammatory esophagitis as a result of exposure to gastric juices. **Gastroesophageal reflux disease (GERD)** is a common gastrointestinal disorder.

FAST FACTS

- GERD affects 15% to 20% of adults.
- Up to 7% of people experience daily symptoms such as heartburn, regurgitation, and indigestion, and as many as 15% have symptoms weekly (Kasper et al., 2005; Tierney et al., 2005).

Pathophysiology

Normally, the lower esophageal sphincter remains closed except during swallowing. Reflux (backflow) of gastric contents into the esophagus is prevented by pressure differences between the stomach and the lower esophagus. The diaphragm, the lower esophageal sphincter, and the location of the gastroesophageal junction below the diaphragm help maintain this pressure difference (Figure 23–2 ■).

Gastroesophageal reflux may result from transient relaxation of the lower esophageal sphincter, an incompetent lower esophageal sphincter, and/or increased pressure within the stomach (Figure 23–3 ■). Factors contributing to gastroesophageal reflux include increased gastric volume (e.g., after meals), positioning that allows gastric contents to remain close to the gastroesophageal junction (e.g., bending over, lying down), and increased gastric pressure (e.g., obesity or wearing tight clothing). A hiatal hernia may contribute to GERD.

Gastric juices contain acid, pepsin, and bile, which are corrosive substances. Esophageal peristalsis and bicarbonate in salivary secretions normally clear and neutralize gastric juices in the esophagus. During sleep, however, and in clients with impaired esophageal peristalsis or salivation, the esophageal mucosa is damaged by gastric juices, causing an inflammatory response. With prolonged exposure, esophagitis develops. Superficial ulcers develop, and the mucosa becomes red, friable (easily torn), and may bleed. If untreated, scarring and esophageal stricture may develop.

Manifestations

GERD causes heartburn, usually after meals, with bending over, or when reclining. Regurgitation of sour material into the mouth, or difficulty and pain with swallowing may develop.

MEDIALINK Case Study: GERD

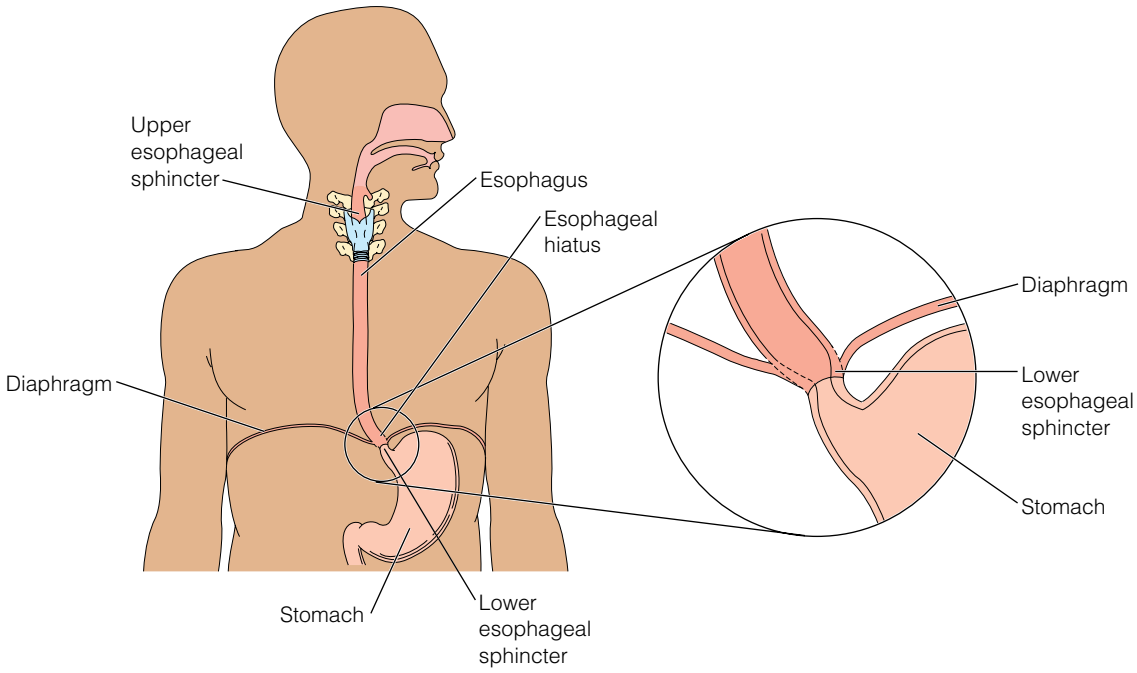


Figure 23–2 ■ The esophagus. The inset shows a closer view of the lower esophageal sphincter.

Other manifestations may include atypical chest pain, sore throat, and hoarseness. See the Manifestations box below. Aspiration of gastric contents can cause hoarseness or respiratory symptoms.

Complications include esophageal strictures and Barrett's esophagus. Strictures can lead to dysphagia. Barrett's esophagus is characterized by changes in the cells lining the esophagus and an increased risk of developing esophageal cancer (Porth, 2005).

MANIFESTATIONS of GERD

- Heartburn
- Dysphagia
- Regurgitation
- Chest pain
- Pain after eating
- Belching

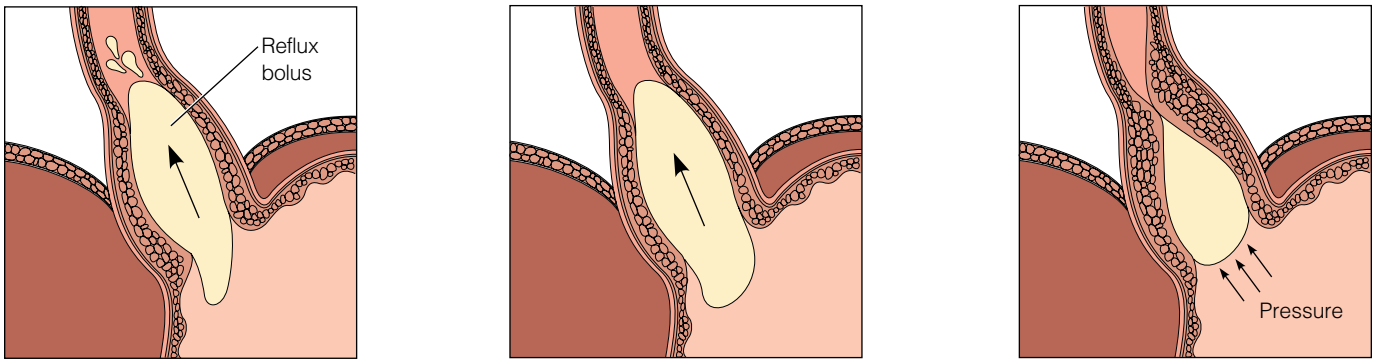
INTERDISCIPLINARY CARE

Often the diagnosis of GERD is made by the history of symptoms and predisposing factors. Interdisciplinary care focuses on lifestyle changes, diet modification, and for more severe cases, drug therapy. Surgery is reserved for clients who develop serious complications.

Diagnosis

Diagnostic tests that may be ordered for clients with manifestations of GERD include:

- *Barium swallow* to evaluate the esophagus, stomach, and upper small intestine.



Transient lower esophageal sphincter relaxation

Incompetent lower esophageal sphincter

Increased intragastric pressure

Figure 23–3 ■ Mechanisms of gastroesophageal reflux.

- *Upper endoscopy* to permit direct visualization of the esophagus. Tissue may be obtained for biopsy to establish the diagnosis and rule out malignancy. See Chapter 21 ∞ for nursing care of the client undergoing an upper endoscopy.
- *24-hour ambulatory pH monitoring* may be performed to establish the diagnosis of GERD. For this test, a small tube with a pH electrode is inserted through the nose into the esophagus. The electrode is attached to a small box worn on the belt that records the data. The data are later analyzed by computer.
- *Esophageal manometry* measures pressures of the esophageal sphincters and esophageal peristalsis.

Medications

Antacids, such as Mylanta or Maalox, relieve mild or moderate symptoms by neutralizing stomach acid. Gaviscon, which forms a floating barrier between the gastric contents and the esophageal mucosa when the client is upright, may also be used.

Omeprazole (Prilosec), lansoprazole (Prevacid), pantoprazole (Protonix), and rabeprazole (Aciphex) are proton-pump inhibitors (PPIs) that reduce gastric secretions. PPIs promote healing of erosive esophagitis and also relieve symptoms. An 8-week course of treatment is initially prescribed, although some clients may require 3 to 6 months of therapy.

Histamine$_2$-receptor (H_2-receptor) blockers reduce gastric acid production and are effective in treating GERD symptoms. When treating GERD, H_2-receptor blockers are usually given twice a day or more frequently for a prolonged period of time. Cimetidine, ranitidine, famotidine, and nizatidine are all approved by the FDA for the treatment of GERD and are available over the counter.

A promotility agent, such as metoclopramide (Reglan), may be ordered to enhance esophageal clearance and gastric emptying. Metoclopramide is used to treat clients with regurgitation, symptoms of indigestion, and nighttime symptoms. However, it is not recommended for long-time use. See the Medication Administration box below for the nursing implications of drugs used to treat GERD.

MEDICATION ADMINISTRATION Drugs Used to Treat GERD, Gastritis, and Peptic Ulcer Disease

PROTON-PUMP INHIBITORS

Esomeprazole (Nexium)
Lansoprazole (Prevacid)
Omeprazole (Prilosec)
Pantoprazole (Protonix)
Rabeprazole (Aciphex)

Proton-pump inhibitors are the drugs of choice for severe GERD. PPIs inhibit the hydrogen-potassium-ATP pump, reducing gastric acid secretion. Initially, the PPI may be given twice a day, with the dose reduced to once daily (at bedtime) after 8 weeks.

Nursing Responsibilities

- Administer before breakfast and at bedtime if ordered twice a day; at bedtime if once a day.
- Do not crush tablets.
- Monitor liver function tests for possible abnormal values, including increased AST, ALT, alkaline phosphatase, and bilirubin levels.

Health Education for the Client and Family

- Take the drug as ordered for the full course of therapy, even if symptoms are relieved.
- Do not crush, break, or chew tablets.
- Avoid cigarette smoking, alcohol, aspirin, and NSAIDs while taking this drug because these substances may interfere with healing.
- Report black tarry stools, diarrhea, or abdominal pain to your primary care provider.

H_2-RECEPTOR BLOCKERS

Cimetidine (Tagamet) **Ranitidine (Zantac)**
Famotidine (Pepcid) **Nizatidine (Axid)**

H_2-receptor blockers reduce acidity of gastric juices by blocking the ability of histamine to stimulate acid secretion by the gastric parietal cells. As a result, both the volume and concentration of hydrochloric acid in gastric juice are reduced. H_2-receptor blockers are given orally or intravenously. Both prescription and over-the-counter preparations are available.

Nursing Responsibilities

- To ensure absorption, do not give an antacid within 1 hour before or after giving an H_2-receptor blocker.
- When administered intravenously, do not mix with other drugs. Administer in 20 to 100 mL of solution over 15 to 30 minutes. Rapid intravenous injection as a bolus may cause dysrhythmias and hypotension.
- Monitor for interaction with such drugs as oral anticoagulants, beta-blockers, benzodiazepines, tricyclic antidepressants, and others. H_2-receptor blockers may inhibit the metabolism of other drugs, increasing the risk of toxicity.

Health Education for the Client and Family

- Take the drug as directed, even if pain and gastric discomfort are relieved early in the course of therapy.
- Take at bedtime if once-a-day dosing is ordered. If spaced through the day, take before meals. Avoid taking antacids for 1 hour before and 1 hour after taking this drug.
- To promote healing, avoid cigarette smoking (which increases gastric acid secretion) and gastric mucosal irritants such as alcohol, aspirin, and NSAIDs.
- Long-term use of these drugs can lead to gynecomastia (breast enlargement) and impotence in men and breast tenderness in women. Discontinuing the drug will reverse these effects.
- Report possible adverse effects such as diarrhea, confusion, rash, fatigue, malaise, or bruising to your care provider.

ANTIULCER AGENT

Sucralfate (Carafate)

Sucralfate reacts with gastric acid to form a thick paste that adheres to damaged gastric mucosal tissue. It protects gastric mucosa and promotes healing through this local action.

MEDIALINK Ranitidine Animation

(continued)

MEDICATION ADMINISTRATION **Drugs Used to Treat GERD, Gastritis, and Peptic Ulcer Disease (continued)**

Nursing Responsibilities
- Administer on an empty stomach, 1 hour before meals and at bedtime.
- Do not crush tablets.
- Separate administration time from antacids by at least 30 minutes.

Health Education for the Client and Family
- Take as directed, even after symptoms have been relieved.
- Do not crush or chew tablets; shake suspension well.
- Increase your intake of fluids and dietary fiber to prevent constipation.

ANTACIDS
Maalox **Gaviscon** **Gelusil** **Tums**
Mylanta **Aludrox** **Riopan** **Amphojel**

Antacids buffer or neutralize gastric acid, usually acting locally. Antacids are used in GERD, gastritis, and peptic ulcer disease to relieve pain and prevent further damage to esophageal and gastric mucosa.

Nursing Responsibilities
- Antacids interfere with the absorption of many drugs given orally; separate administration times by at least 2 hours.
- Monitor for constipation or diarrhea resulting from antacid therapy. Notify the physician should either develop; a different antacid may be ordered.
- Although most antacids have little systemic effect, electrolyte imbalances can develop. Monitor serum electrolytes, particularly sodium, calcium, and magnesium levels.

Health Education for the Client and Family
- Take your antacid frequently as prescribed, 1 to 3 hours after meals and at bedtime. To be effective, the antacid must be in your stomach.
- Avoid taking an antacid for approximately 2 hours before and 1 hour after taking another medication.
- Shake suspensions well prior to administration.
- Chew tablets thoroughly, and follow with 4 to 6 ounces of water.
- Report worsening symptoms, diarrhea, or constipation to your primary care provider.
- Continue taking the antacid for the duration prescribed. Although pain and discomfort often are relieved soon after treatment begins, healing takes 6 to 8 weeks.

PROMOTILITY AGENT
Metoclopramide (Reglan)

By acting on the central nervous system, metoclopramide stimulates upper gastrointestinal motility and gastric emptying. As a result, nausea, vomiting, and symptoms of GERD are reduced.

Nursing Implications
- Do not administer this drug to clients with possible gastrointestinal obstruction or bleeding, or a history of seizure disorders, pheochromocytoma, or Parkinson's disease.
- Monitor for extrapyramidal side effects (e.g., difficulty speaking or swallowing, loss of balance, gait disruptions, twitching or twisting movements, weakness of arms or legs) or manifestations of tardive dyskinesia (uncontrolled rhythmic facial movement, lip-smacking, tongue rolling). Report immediately.
- Give oral doses 30 minutes before meals and at bedtime.
- May be given by direct intravenous push over 1 to 2 minutes, or diluted by slow infusion over 15 to 30 minutes.

Health Education for the Client and Family
- Take this drug as directed. If you miss a dose, take as soon as you remember unless it is close to time for the next dose.
- Do not drive or engage in other activities that require alertness if this drug makes you drowsy.
- Avoid using alcohol or other CNS depressants while you are taking this drug.
- Immediately contact your healthcare provider if you develop involuntary movements of your eyes, face, or limbs.

Nutrition and Lifestyle Management

GERD is a chronic condition. Dietary and lifestyle changes are important to reduce symptoms and long-term effects of the disorder. Acidic foods such as tomato products, citrus fruits, spicy foods, and coffee are eliminated from the diet. Fatty foods, chocolate, peppermint, and alcohol relax the lower esophageal sphincter or delay gastric emptying, so they should be avoided. The client is advised to maintain ideal body weight, eat smaller meals, refrain from eating for 3 hours before bedtime, and stay upright for 2 hours after meals. Elevating the head of the bed on 6- to 8-inch blocks often is beneficial. Stopping smoking is a necessary lifestyle change. Avoiding tight clothing and avoiding bending may help to relieve symptoms.

Surgery

Surgery may be used for clients who do not respond to pharmacologic and lifestyle management. Antireflux surgeries increase pressure in the lower esophagus, inhibiting gastric content reflux. Laparoscopic fundoplication, a procedure in which the gastric fundus is wrapped around the distal esophagus, is the treatment of choice for GERD. An open surgical procedure known as Nissen fundoplication also may be done (Figure 23–4 ■). Other laparoscopic procedures to tighten the lower esophageal sphincter may include use of an endoscopic suturing system or burning spots on the muscle surrounding the sphincter to create scar tissue. Surgery or ablation therapy also is recommended to reduce the risk of esophageal cancer in clients with persistent cell changes in the distal esophagus.

NURSING CARE

Assessment

Assessment data related to GERD include the following:
- *Health history:* Manifestations such as frequent heartburn; intolerance of foods that are acidic, spicy, or fatty; regurgitation of acidic gastric juice; increased symptoms when bending over, lying down, or wearing tight clothing; difficulty swallowing.
- *Physical assessment:* Epigastric tenderness.

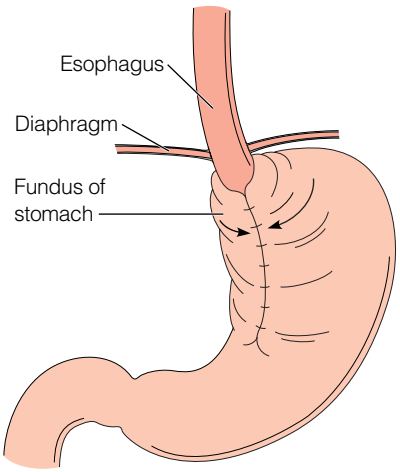


Figure 23–4 ■ Nissen fundoplication. The fundus of the stomach is wrapped around the lower esophagus and the edges are sutured together.

Nursing Diagnoses and Interventions

Relieving the discomfort associated with GERD is the priority of nursing care. Teaching focuses on preventing symptoms and long-term consequences of the disorder.

Pain

The epigastric pain associated with GERD can be severe, interfering with rest and causing anxiety.

- Provide small, frequent meals. Restrict intake of fat, acidic foods, coffee, and alcohol. *Limiting the size of meals reduces pressure in the stomach, reducing esophageal reflux. Fatty, acidic foods, coffee, and alcohol increase gastric acidity and interfere with gastric emptying, increasing the incidence of gastroesophageal reflux.*
- Instruct to stop smoking. Refer to a smoking cessation clinic or program as needed. *Cigarette smoking increases gastric acidity and interferes with healing of damaged mucosa.*
- Administer antacids, H_2-receptor blockers, and PPIs as ordered. Instruct client to continue therapy as prescribed, even after symptoms have been relieved. *These drugs neutralize or reduce gastric acid secretion, relieving symptoms and promoting healing.*
- Discuss the long-term nature of GERD and its management. *Lifestyle changes need to be continued after healing and symptom relief to manage the long-term effects of GERD.*

Using NANDA, NIC, and NOC

Chart 23–2 shows links between NANDA nursing diagnoses, NIC, and NOC when caring for a client with GERD.

Community-Based Care

GERD is a lifelong condition best managed by the client. Teach the client and family about continuing management strategies, including dietary changes, remaining upright after meals, and avoiding eating for at least 3 hours before bedtime. Suggest elevating the head of the bed on 6- to 8-inch wooden blocks placed under the legs. Discuss the need for continued gastric acid reduction using antacids, H_2-receptor blockers, or PPIs. All are effective to reduce the acidity of gastric juices. Antacids, the most cost-effective measure, require frequent doses to neutralize gastric acid. H_2-receptor blockers, also available over the counter, are a cost-effective management strategy that require only twice-a-day dosing.

NANDA, NIC, AND NOC LINKAGES

CHART 23–2 The Client with GERD

NANDA
Pain: Heartburn
↓
NIC
Behavior Modification
Nutrition Monitoring
Teaching: Individual
↓
NOC
Pain: Disruptive Effects
Nutritional Status: Food and Fluid Intake
Knowledge: Treatment Regimen

Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Mass (2004), St. Louis, MO: Mosby.

THE CLIENT WITH HIATAL HERNIA

A **hiatal hernia** occurs when part of the stomach protrudes through the esophageal hiatus of the diaphragm into the thoracic cavity. Although hiatal hernia is thought to be a common problem, most affected individuals are asymptomatic. The incidence of hiatal hernia increases with age.

In a *sliding hiatal hernia,* the gastroesophageal junction and the fundus of the stomach slide upward through the esophageal hiatus (Figure 23–5A ■). Several factors may contribute to a sliding hiatal hernia, including weakened gastroesophageal-diaphragmatic anchors, shortening of the esophagus, or increased intra-abdominal pressure. Small sliding hiatal hernias produce few symptoms.

In a *paraesophageal hiatal hernia,* the junction between the esophagus and stomach remains in its normal position below the diaphragm while a part of the stomach herniates through the esophageal hiatus (Figure 23–5B). A paraesophageal hernia can become incarcerated (constricted) and strangulate, impairing blood flow to the herniated tissue. Clients with paraesophageal hernia may develop gastritis, or chronic or acute gastrointestinal bleeding. The manifestations of hiatal hernias are listed in the box on the following page.

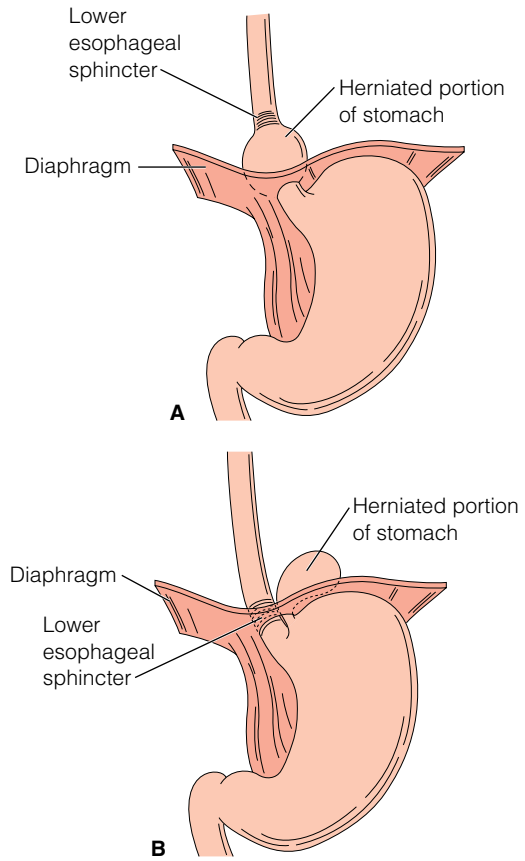


Figure 23–5 ■ Hiatal hernias. *A*, Sliding hiatal hernia. *B*, Paraesophageal hiatal hernia.

A barium swallow or an upper endoscopy may be done to diagnose hiatal hernia. Many clients with hiatal hernia require no treatment. If symptoms are present, treatment measures such as those for clients with GERD may be ordered. If medical management is ineffective or the hernia becomes incarcerated, surgery may be required. The most common surgical procedure is the Nissen fundoplication (see Figure 23–4). This surgery, which may be done laparoscopically, prevents the gastroesophageal junction from slipping into the thoracic cavity.

Nursing care for the client with a hiatal hernia is similar to that for the client with GERD. If surgery is performed, nursing care is similar to that for clients undergoing gastric or thoracic surgery (see Chapter 4 ∞).

MANIFESTATIONS of Hiatal Hernia

- Reflux, heartburn
- Feeling of fullness
- Substernal chest pain
- Dysphagia
- Occult bleeding
- Belching, indigestion

THE CLIENT WITH IMPAIRED ESOPHAGEAL MOTILITY

Disorders of esophageal motility can cause **dysphagia** (difficult or painful swallowing) or chest pain. It is estimated that nearly 75% of clients hospitalized with stroke experience dysphagia. Other neurologic disorders such as Parkinson's disease, amyotrophic lateral sclerosis, and Alzheimer's disease also can cause dysphagia.

Primary disorders of swallowing are less common. **Achalasia**, a disorder of unknown etiology, is characterized by impaired peristalsis of the smooth muscle of the esophagus and impaired relaxation of the lower esophageal sphincter (LES). The client experiences gradually increasing dysphagia with both solid foods and liquids. Fullness in the chest during meals, chest pain, and nighttime cough are additional manifestations. Other clients may experience **diffuse esophageal spasm** that causes nonperistaltic contraction of esophageal smooth muscle. This disorder causes chest pain and/or dysphagia. The chest pain can be severe, and usually occurs at rest.

Treatment of achalasia may include endoscopically guided injection of botulinum toxin into the lower esophageal sphincter or balloon dilation of the LES. Botulinum toxin injection lowers LES pressure, but may need to be repeated every 6 to 9 months. Balloon dilation tears muscle fibers in the LES, reducing its pressure (Figure 23–6 ■). A laparoscopic myotomy (in-

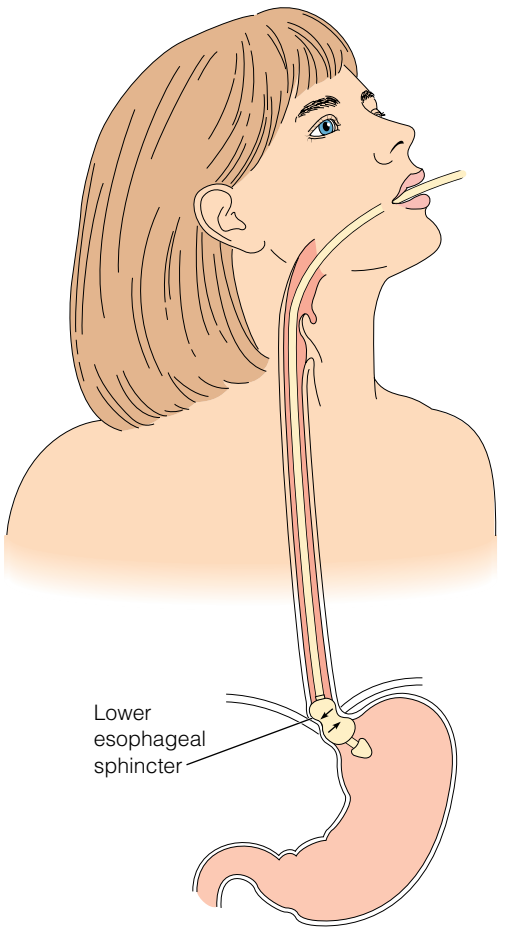


Figure 23–6 ■ Balloon dilation of the lower esophageal sphincter.

cision into the circular muscle layer of the LES) also reduces pressure and relieves symptoms.

THE CLIENT WITH ESOPHAGEAL CANCER

Cancer of the esophagus is a relatively uncommon malignancy in the United States. It does, however, have a high mortality rate, primarily because symptoms often are not recognized until late in the course of the disease.

FAST FACTS

- Esophageal cancer is the sixth leading cause of death in men.
- It accounted for an estimated 13,570 deaths in 2005.
- 10,530 deaths attributed to esophageal cancer in 2005 were in men.
- Esophageal cancer affects African Americans about 50% more frequently than Caucasians (American Cancer Society, 2005)
- Most esophageal tumors develop in the lower third of the esophagus.

Pathophysiology

There are two types of esophageal tumors, adenocarcinoma and squamous cell carcinoma. Over the past two decades, the incidence of squamous cell tumors of the esophagus has been decreasing, whereas the incidence of adenocarcinoma has increased dramatically, particularly among white males (Kasper et al., 2005). Cigarette smoking and chronic alcohol use are strong risk factors for squamous cell esophageal tumors, and also appear to contribute to the risk of developing adenocarcinoma. Box 23–3 lists major identified risk factors for esophageal cancer.

Only about 15% of esophageal tumors develop in the upper portion of the esophagus; about 35% develop in the midportion. The lower third of the esophagus is the most common site, accounting for about 50% of tumors. Adenocarcinomas tend to develop in dysplastic (abnormal) columnar epithelium in the distal esophagus. It is commonly associated with Barrett's esophagus, a possible complication of chronic GERD and achalasia.

The disease usually spreads to adjacent and supraclavicular lymph nodes, the liver, lungs, and the pleura.

BOX 23–3 Risk Factors for Esophageal Cancer

- Excess alcohol consumption
- Cigarette smoking
- Ingested carcinogens such as nitrates and industrial chemicals
- Smoked opiates
- Physical mucosal damage (e.g., lye ingestion, radiation damage, chronic achalasia)
- Congenital disorders
- Chronic gastric reflux

MANIFESTATIONS of Esophageal Cancer

- Dysphagia
- Anemia
- Weight loss
- GERD-like symptoms
- Regurgitation
- Anorexia
- Chest pain
- Persistent cough

Manifestations

The most common symptoms of esophageal carcinoma are progressive dysphagia and recent weight loss. Other manifestations are listed in the box above. The cancer often is advanced and incurable by the time the disease is diagnosed, because symptoms such as difficulty swallowing don't develop until more than 60% of the circumference of the esophagus is affected by tumor (Kasper et al., 2005).

Tracheoesophageal fistulas may develop as the disease progresses, leading to aspiration and pneumonia. Paraneoplastic symptoms such as hypercalcemia also may accompany advanced esophageal cancer.

INTERDISCIPLINARY CARE

Controlling dysphagia and maintaining nutritional status are essential goals of therapy for clients with esophageal cancer, regardless of the stage of the disease. Treatment may involve surgery, radiation therapy, and/or chemotherapy.

Diagnosis

Diagnostic and staging procedures for esophageal cancer may include esophagography, bronchoscopy, and scans to detect metastasis. The following diagnostic tests may be performed (see Chapter 21):

- *Barium swallow* to identify irregular mucosal patterns or narrowing of the lumen, which suggests esophageal cancer.
- *Esophagoscopy* to allow direct visualization of the tumor and obtain tissue for biopsy.
- *Chest x-ray, CT scans,* or *MRI* to identify possible tumor metastases to other organs or tissues.
- *Complete blood count (CBC)* may indicate anemia due to chronic blood loss. *Serum albumin levels* may be low due to malnutrition, and *liver function tests (ALT, alkaline phosphatase, AST,* and *bilirubin)* are elevated if liver metastases are present.

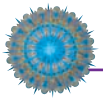
Treatments

The treatment of esophageal cancer depends on the stage of the disease, as well as factors such as the client's condition and preference.

Clients with early, "curable" esophageal cancer may be treated with surgery alone. Surgery involves resection of the affected portion of the esophagus (*esophagectomy*) and possible anastomosis of the stomach to the remaining esophagus. Mediastinal lymph nodes may be resected at the time of surgery. Esophagectomy is not without risk; potential surgical complications include anastomosis leak, respiratory complications

such as pneumonia or acute respiratory distress syndrome, gastric necrosis or bleeding, cardiac dysrhythmias, and infection and sepsis. Intensive nursing care is required postoperatively to prevent and rapidly identify and treat complications that do develop (Mackenzie et al., 2004).

Other approaches to early esophageal cancer include combined radiation and chemotherapy, or a combination of radiation therapy and chemotherapy prior to surgical resection of the tumor. Complications associated with radiation therapy to the esophagus include perforation, hemorrhage, and strictures. When the tumor has spread locally or to distant sites, palliative therapy relieves dysphagia and pain (Tierney et al., 2005). Palliative therapy may include surgical resection, radiation therapy, or local treatments such as wire stents or laser therapy to keep the esophagus patent.



NURSING CARE

Health Promotion

Health promotion measures to reduce the risk for and incidence of esophageal cancer include educating people (especially young people) about the dangers of cigarette smoking and excess alcohol use. Refer to smoking cessation and alcohol treatment programs as indicated. Educate clients with GERD about the relationship between chronic damage to the esophagus due to reflux and esophageal cancer, and stress the importance of effective disease management.

Assessment

Early diagnosis and treatment of esophageal cancer can make a difference in the client's prognosis. Collect the following assessment data related to esophageal cancer:

- *Health history:* Current symptoms such as chest pain, dysphagia, odynophagia (pain with swallowing), coughing or hoarseness; duration of symptoms; recent weight loss; smoking history; current and past patterns of alcohol consumption.
- *Physical examination:* weight; general health status; skin color; supraclavicular and cervical lymph nodes for lymphadenopathy.

Nursing Diagnoses and Interventions

Disruption of the integrity and function of the esophagus and the discomfort associated with swallowing in clients with esophageal cancer affect the client's ability to maintain adequate nutritional status, and, potentially, a patent airway.

Imbalanced Nutrition: Less than Body Requirements

The client diagnosed with esophageal cancer may already suffer from some degree of malnutrition because of difficulty and pain with swallowing. Enteral nutrition via nasogastric feeding tube or gastrostomy tube or parenteral nutrition maintain nutritional status after surgery or if the tumor is inoperable and obstruction occurs. See Chapter 21 ∞ for nursing interventions related to enteral and parenteral feedings.

Risk for Ineffective Airway Clearance

After surgery for esophageal cancer, the client is at high risk for aspiration and difficulty maintaining a patent airway due to disruption of the esophagus and incision into the thoracic cavity.

- Assess mental and respiratory status (including rate, depth, breath sounds, and oxygen saturation levels) at least every hour during the initial postoperative period. *Altered mental status increases the risk for aspiration. An increased respiratory rate, dyspnea, diminished breath sounds, or decreased oxygen saturation levels may indicate impaired airway clearance or possible aspiration pneumonia.*
- Provide aggressive pulmonary hygiene measures, including endotracheal suctioning and chest physiotherapy as indicated or ordered. Following extubation, encourage frequent coughing, deep breathing, and use of the incentive spirometer. *Respiratory complications are a frequent complication of esophagectomy. Aggressive nursing care helps mobilize secretions and prevent atelectasis and possible pneumonia.*
- If present, monitor chest tube function and drainage. Promptly report drainage that is bright red and excessive in amount (> 70 mL/h) or purulent. Maintain patency of chest tubes per unit protocol or physician's order. *If a thoracic incision has been used, chest tubes are placed to promote lung reinflation. Proper chest tube function is necessary to prevent pneumothorax and impaired lung inflation.*
- Monitor cardiopulmonary status and hemodynamic pressures. Administer intravenous fluids and fluid boluses as ordered. *Fluid volume imbalances that compromise cardiopulmonary status may develop following esophagectomy. Maintaining adequate fluid intake and preventing fluid overload are important postoperatively. The client also is at risk for acute respiratory distress syndrome, a critical complication that can further compromise ventilation, gas exchange, and circulation.*
- Do not move or manipulate the nasogastric tube. Maintain low gastric suction as ordered. *Manipulating or moving the nasogastric tube may disrupt suture lines, resulting in a leak into the mediastinum.*
- Verify enteral tube feeding placement by checking the pH of gastric aspirate (see Chapter 22 ∞). Stop enteral feedings if feelings of fullness or nausea occur. Suction gastrointestinal contents as needed, positioning the client on the side. *Overdistention of the stomach or delayed gastric emptying may result in regurgitation of stomach contents. Nausea or a feeling of fullness may indicate stomach overdistention. Suctioning and positioning limit the risk of aspiration.*

Anticipatory Grieving

Upon a diagnosis of cancer, the client and family may experience a grief reaction. The pessimistic prognosis associated with esophageal cancer and the disruptions in relationships may result in an intense sense of loss. Chapter 5 ∞ discusses care of client experiencing grief and loss.

Community-Based Care

Most care for clients with esophageal cancer is provided in community-based and home settings. Include the following topics in client and family teaching for home care:

- Planned treatment options including the risks, benefits, and potential adverse effects of each
- Wound and follow-up care following surgery
- Prevention and manifestations of complications such as wound or chest infection, anastomosis leak, deep venous thrombosis
- How to prepare, implement, and care for tube feedings or home parenteral nutrition.

Based on the client's needs and prognosis, referral to a home health agency and/or hospice may be appropriate.

DISORDERS OF THE STOMACH AND DUODENUM

The stomach and upper small intestine (duodenum and jejunum) are responsible for the majority of food digestion. The major disorders that affect digestion are nausea and vomiting, gastritis, peptic ulcer disease, and cancer of the stomach. Nursing roles in managing these disorders include both acute care for the hospitalized client and teaching to give the client the skills and knowledge to manage these conditions at home.

OVERVIEW OF NORMAL PHYSIOLOGY

Normally, the stomach is protected from the digestive substances it secretes—namely, hydrochloric acid and pepsin—by the **gastric mucosal barrier**. The gastric mucosal barrier includes:

- An impermeable hydrophobic lipid layer that covers gastric epithelial cells. This lipid layer prevents diffusion of water-soluble molecules, but substances such as aspirin and alcohol can diffuse through it.
- Bicarbonate ions secreted in response to hydrochloric acid secretion by the parietal cells of the stomach. When bicarbonate (HCO_3^-) secretion is equal to hydrogen ion (H^+) secretion, the gastric mucosa remains intact. Prostaglandins, chemical messengers involved in the inflammatory response, support bicarbonate production and blood flow to the gastric mucosa.
- Mucous gel that protects the surface of the stomach lining from the damaging effects of pepsin and traps bicarbonate to neutralize hydrochloric acid. This gel also acts as a lubricant, preventing mechanical damage to the stomach lining from its contents.

When an acute or chronic irritant disrupts the mucosal barrier, or when disease alters the processes that maintain the barrier, the gastric mucosa becomes irritated and inflamed. Lipid-soluble substances such as aspirin and alcohol penetrate the gastric mucosal barrier, leading to irritation and possible inflammation. Bile acids also break down the lipids in the mucosal barrier, increasing the potential for irritation (Porth, 2005). In addition, aspirin and other nonsteroidal anti-inflammatory drugs (NSAIDs) inhibit prostaglandins. Aspirin and NSAIDs also alter the nature of gastric mucus, affecting its protective function.

THE CLIENT WITH NAUSEA AND VOMITING

Nausea and vomiting are common gastrointestinal symptoms. **Nausea** is a vague, but unpleasant sensation of sickness or queasiness. It may or may not be accompanied by (and possibly relieved by) vomiting. **Vomiting** is the forceful expulsion of the contents of the upper gastrointestinal tract resulting from contraction of muscles in the gut and abdominal wall. Nausea and vomiting without abdominal pain are commonly associated with food poisoning, infectious gastroenteritis (discussed in Chapter 26 ∞), gallbladder disease, or ingestion of toxins (such as drugs or alcohol). When associated with severe abdominal pain, they may indicate a serious disorder such as peritonitis, acute gastrointestinal obstruction, or pancreatitis.

Pathophysiology

Nausea, an unpleasant subjective sensation, occurs when the vomiting center in the medulla of the brain is stimulated. Distention of the duodenum is a common stimulus for nausea. The vomiting center can be stimulated by input from several different sources:

- The gastrointestinal tract produced by distention, irritation, or infection
- The vestibular system of the ear
- Higher central nervous system centers in response to certain sights, smells, or emotional experiences
- Chemoreceptors outside the blood–brain barrier that are stimulated by drugs, chemotherapeutic agents, toxins, systemic disorders, and pregnancy
- Disorders such as acute myocardial infarction and heart failure commonly produce nausea and vomiting, possibly due to direct stimulation of the vomiting center by hypoxia
- Increased intracranial pressure (e.g., due to intracranial bleeding or a tumor) produces vomiting that may or may not be accompanied by nausea.

Anorexia, loss of appetite, commonly precedes nausea, just as nausea frequently precedes vomiting. Vomiting, a response that requires coordinated movements of the thorax and abdominal wall, the gut, the pharynx, and muscles of the mouth and face, is coordinated by the brainstem. *Emesis* (or *vomitus*) is produced when inspiratory muscles of the thorax (including the diaphragm) and abdomen contract, increasing intrathoracic and intra-abdominal pressures. The gastroesophageal sphincter relaxes, and the larynx moves upward to facilitate oral expulsion of gastric contents.

In addition to the subjective sensation of queasiness, nausea frequently is accompanied by autonomic nervous system manifestations such as pallor, sweating, tachycardia, and increased salivation. Vomiting, which stimulates the vagus nerve and parasympathetic nervous system, may be accompanied by dizziness, light-headedness, hypotension, and bradycardia.

Potential complications of vomiting include dehydration, hypokalemia, metabolic alkalosis (from loss of hydrochloric acid from the stomach), aspiration with resulting pneumonia, and rupture or tears of the esophagus.

INTERDISCIPLINARY CARE

In most cases, nausea and vomiting are self-limited and require no treatment. If vomiting is severe or accompanied by other symptoms, acute care may be required to determine the underlying problem and prevent or treat complications.

Diagnostic tests may include serum electrolytes; pregnancy testing if indicated; liver, pancreatic, and renal function studies; and imaging studies (flat plate of the abdomen, abdominal CT scan) to detect gastrointestinal obstruction. An upper endoscopy may be performed (see Chapter 21 ∞ for nursing care of the client undergoing upper endoscopy). CT scan or MRI of the head may be ordered if an intracranial problem is suspected as the cause. Specialized testing such as gastrointestinal motility studies may be indicated when other diagnostic studies are negative for an anatomic cause of nausea and vomiting.

Food is initially withheld, although clear liquids in small quantities are encouraged to prevent dehydration. Dry foods such as soda crackers also may reduce nausea and promote comfort.

Medications

Unless vomiting is associated with pregnancy, antiemetic medications may be prescribed to prevent or control nausea and vomiting. These drugs fall into several different classes, and often are more effective when given in combination.

- Serotonin receptor antagonists are the most effective drugs available for clients experiencing nausea and vomiting due to chemotherapy. They are effective when given only once or twice a day, an additional advantage. Drugs within this class include ondansetron (Zofran), granisetron (Kytril), and dolasetron (Anzemet).
- Dopamine antagonists include the phenothiazines (e.g., prochlorperazine [Compazine], promethazine [Phenergan], thiethylperazine [Torcan]), butyrophenones (haloperidol [Haldol] and droperidol [Inapsine]), and other drugs such as metoclopramide (Reglan). These drugs, while effective, can produce extrapyramidal symptoms, sedation, and hypotension.
- Antihistamines such as meclizine (Antivert), hydroxyzine (Vistaril, Atarax), and dimenhydrinate (Dramamine) are primarily used to treat nausea and vomiting arising from vestibular center stimuli (e.g., motion sickness).
- Two drugs classed as cannabinoids, related to marijuana, are approved to treat nausea and vomiting associated with chemotherapy. These drugs, dronabinol (Marinol) and nabilone (Cesamet), may produce unpleasant psychiatric effects such as dissociation and dysphoria, and are contraindicated for clients with psychiatric disorders. They also may produce tachycardia and hypotension.
- While corticosteroids are not approved as a class for treating nausea and vomiting, two drugs in this class, methylprednisolone (Solu-Medrol) and dexamethasone (Decadron), may be used in combination to treat vomiting associated with cancer treatment.
- Lorazepam (Ativan) is a benzodiazepine drug approved for use as an antiemetic. It produces a degree of sedation, but can suppress anticipatory vomiting (e.g., before chemotherapy). It also helps control extrapyramidal symptoms associated with the phenothiazine antiemetics (dopamine antagonists).

Nursing responsibilities and client education for antiemetic drugs are outlined in the accompanying Medication Administration box.

Complementary and Alternative Medicine

Mind–body interventions such as biofeedback, guided imagery, music therapy, and hypnosis may be effective for some clients with nausea. Biofeedback uses machinery to translate physiologic processes into audible or visible signals to teach the client to exert conscious control over those processes. In guided imagery, the client uses imagination to invoke specific images to modify physiologic responses. Music therapy employs creating or listening to music to affect physiologic and psychologic responses. In hypnosis, an altered mind state is induced to make the client receptive to suggestions.

Ginger, an aromatic root frequently used in cooking, may also be helpful in relieving nausea and vomiting, particularly when due to motion sickness (Fontaine, 2005; Spencer & Jacobs, 2003). In limited clinical trials, it also has been shown to be safe for reducing nausea associated with pregnancy. It may also help relieve nausea associated with cancer chemotherapy. Ginger can inhibit platelet aggregation, and may increase the risk of bleeding in clients taking antiplatelet or anticoagulant drugs (Lehne, 2004).

NURSING CARE

Assessment of the client is vital to help determine the cause of nausea and vomiting, and to rule out underlying systemic disease or acute conditions that require immediate care (e.g., bowel obstruction). When the cause is known or no other acute symptoms are present, nursing interventions can promote comfort and prevent complications.

Nausea

The nursing diagnosis of nausea is defined as a subjective, unpleasant, wavelike sensation in the throat, epigastric region, or abdomen that may lead to vomiting (Wilkinson, 2005).

- Monitor subjective complaints of nausea. *Nausea is a subjective sensation best described by the client.*
- Monitor vital signs, skin turgor and condition, and weight. Maintain accurate intake and output records. Monitor amount, color, and specific gravity of urine. *Nausea can cause aversion to food and fluids, leading to dehydration even when it is not accompanied by vomiting.*
- Administer antiemetic medication as ordered, prior to meals and before treatments or procedures known to stimulate nausea. *Preventing nausea is particularly important for clients receiving chemotherapy, to avoid the association between the treatment and nausea.*
- Instruct to deep breathe to voluntarily suppress the vomiting reflex. *Controlling vomiting helps prevent dehydration and other complications associated with prolonged or severe vomiting.*
- Instruct to consume small quantities of clear fluids and dry foods at separate times. *Separating the intake of dry foods and fluids helps reduce the nausea stimulus.*

MEDICATION ADMINISTRATION Drugs Used to Prevent and Treat Nausea and Vomiting

SEROTONIN RECEPTOR ANTAGONISTS

Ondansetron (Zofran)
Granisetron (Kytril)
Dolasetron (Anzemet)

The serotonin receptor antagonists suppress nausea and vomiting by blocking the effect of serotonin on vagal afferent nerves that stimulate the vomiting center. Their primary uses are to prevent vomiting associated with chemotherapy, radiation therapy, and surgery.

Nursing Responsibilities

- Administer 30 to 60 minutes prior to chemotherapy or surgery as directed.
- May be given orally or intravenously (push or infusion; follow directions specific to the drug used).
- Monitor liver function and clotting studies; report abnormal levels to the physician.

Health Education for the Client and Family

- Take this drug exactly as directed.
- This drug may be taken without regard to food intake.
- Headache is a common side effect of these drugs, use acetaminophen or another mild analgesic as directed by your physician.

DOPAMINE ANTAGONISTS

Prochlorperazine (Compazine)
Promethazine (Phenergan)
Thiethylperazine (Torcan)
Haloperidol (Haldol)
Droperidol (Inapsine)
Metoclopramide (Reglan)

These drugs act by blocking dopamine receptors in the chemoreceptor trigger zone (CTZ). Their primary uses are to suppress nausea and vomiting associated with surgery, cancer chemotherapy, and toxins. The major adverse effects associated with these drugs are sedation, hypotension, and extrapyramidal reactions. Older adults are more sensitive to the effects of these drugs; a lower dose often is indicated.

Nursing Responsibilities

- Administer orally or parenterally as ordered before surgery or before meals and procedures known to produce nausea and vomiting.
- These drugs may interact with a number of other medications, often increasing their sedative and hypotensive effects.
- Administer with caution to older adults, closely monitoring for adverse effects such as confusion, agitation, changes in vital signs.
- Monitor for evidence of extrapyramidal symptoms, including tremor, restlessness, hyperactivity, anxiety, impaired coordination; notify physician if symptoms develop.

Health Education for the Client and Family

- Use the drug as ordered; do not increase your dose without consulting your primary care provider.
- These drugs may cause drowsiness. Avoid using other central nervous system (CNS) depressants such as alcohol while taking these drugs.
- Change positions from lying to sitting and sitting to standing slowly because these drugs can cause light-headedness or dizziness.
- Promptly report changes in coordination, tremors, difficulty speaking or swallowing, or weakness to your physician.

ANTIHISTAMINES

Meclizine (Antivert)
Hydroxyzine (Vistaril, Atarax)
Dimenhydrinate (Dramamine)

Antihistamines are primarily used to treat nausea and vomiting associated with motion sickness. They act by blocking histamine and acetylcholine (muscarinic) receptors in the neural pathway from the inner ear to the vomiting center in the brainstem.

Nursing Responsibilities

- Do not administer these drugs to clients for whom anticholinergic drugs are contraindicated: people with narrow-angle glaucoma, urinary retention, bowel obstruction.
- May be administered orally, parenterally, or rectally, depending on the preparation and the client's ability to tolerate oral preparations.
- Use with caution in clients who are taking other CNS depressants or antihistamine preparations, tricyclic antidepressants, or monoamine oxidase inhibitors.

Health Education for the Client and Family

- These drugs frequently cause drowsiness. Use caution when operating machinery or performing tasks requiring mental alertness.
- Avoid using alcohol or other substances that cause drowsiness or sedation while taking these drugs.
- The medication may cause dry mouth. Sips of water, ice chips, hard candies, and sugarless gum can be used for comfort.
- Use sunscreen and protective clothing to protect from sunburn while using these drugs.

CANNABINOIDS

Dronabinol (Marinol)
Nabilone (Cesamet)

Drugs in this class, which contain the same active ingredient as marijuana, are reserved for use to relieve nausea and vomiting associated with cancer chemotherapy in clients who have not responded to treatment with other antiemetics. Their action is thought to result from inhibition of the vomiting center in the medulla.

Nursing Responsibilities

- Use with caution in older adults and people with a history of cardiovascular disease or substance abuse. These drugs are contraindicated for clients with a history of psychiatric disorders.
- Monitor for adverse effects such as dizziness, tachycardia, hypotension, impaired thinking and judgment, incoordination, irritability, depersonalization, distorted vision, and hallucinations.

Health Education for the Client and Family

- Take the drug 1 to 3 hours before chemotherapy.
- Change positions slowly after taking this drug to prevent dizziness.
- You may experience distorted thinking, visual disturbances, confusion, and other mental symptoms while taking this drug.
- Keep this and all drugs out of the reach of children. Do not share this drug with anyone else.

Community-Based Care

Instruct the client to restrict intake to small quantities of clear liquids (tea, apple juice, broth, Jell-O) and dry foods such as soda crackers to help reduce nausea and prevent vomiting. Teach to avoid food-preparation odors if they produce nausea. Advise to restrict fluid intake for 1 hour before and after meals. Stress the need to maintain fluid intake to prevent dehydration and the importance of seeking additional medical help if unable to take in fluids or keep food down. Provide information about electrolyte replacement solutions such as sports drinks and commercially available electrolyte replacement solutions.

THE CLIENT WITH GASTROINTESTINAL BLEEDING

Because of its constant exposure to the environment, the gastrointestinal tract can be subjected to trauma, exposure to toxins, infection with pathogens such as *Helicobacter pylori*, inflammatory processes, and insults such as ischemia due to systemic diseases. While the mucosal lining of the GI tract is remarkably able to withstand these insults and heal rapidly, its rich supply of blood can result in significant bleeding when a vessel is eroded or abnormally distended (*varices*). Gastrointestinal hemorrhage is a relatively common admitting diagnosis and complication of critical illnesses. It is a medical emergency requiring aggressive medical and nursing care.

Although bleeding and hemorrhage can occur anywhere in the GI tract, the upper portion of the tract is more commonly affected. The three primary disorders leading to upper (UGI) hemorrhage are erosive gastritis, peptic ulcer disease, and esophageal varices. Erosive gastritis and peptic ulcer disease are discussed in the following sections of this chapter; esophageal varices, usually seen as a complication of cirrhosis of the liver, are discussed in Chapter 24 ∞.

FAST FACTS

- About 50% of UGI bleeds are due to peptic ulcer disease.
- Erosive gastritis is the second leading cause of UGI hemorrhage, responsible for about 20% of bleeds.
- The third leading cause, esophageal varices, has the highest mortality rate, between 40% and 70% (Urden et al., 2006).

Pathophysiology

Blood in the GI tract has several effects. It is irritating to the stomach, and typically leads to nausea and vomiting (**hematemasis**, vomiting blood). If the blood has been present in the stomach for a period of time and is partially digested, it may have a "coffee-grounds" appearance, rather than presenting as bright red blood. The accumulation of blood in the GI tract stimulates peristasis, leading to hyperactive bowel sounds and diarrhea. Stools may be black and tarry (**melena**) or frankly bloody (**hematochezia**); stool containing partially digested blood has a characteristic odor. With significant upper GI bleeding, digestion of blood proteins increases blood urea nitrogen (BUN) levels.

Physiologic responses to an upper GI bleed depend on the rapidity and magnitude of the blood loss. GI bleeding resulting from erosion of a small vessel typically is slow, and may not be identified until the client presents with manifestations of blood loss anemia due to depletion of iron stores. (See Chapter 34 ∞ for further discussion of blood loss anemia.) Although no visible blood may be present in the stool, **occult** (or hidden) **bleeding** may be detected by chemical means.

GI hemorrhage, with loss of a significant amount of blood within a few hours, rapidly depletes blood volume, producing manifestations of decreased cardiac output: tachycardia, hypotension, pallor, and decreased urine output. Peripheral blood vessels constrict to maintain perfusion of vital organs. Unless the blood volume is restored, hypovolemic shock progresses, leading to acidosis, renal failure, bowel infarction, acute coronary syndrome, coma, and death. See Chapter 11 ∞ for more information about shock and its management.

INTERDISCIPLINARY CARE

The acuity of the bleed and the client's condition dictate the timing and extent of diagnostic testing and interventions. A client with a massive GI hemorrhage is admitted to the critical care unit and aggressively treated to stem bleeding, restore blood volume, and stabilize the cardiovascular system. Identifying the cause of the bleeding is postponed in many cases until the client's condition has been stabilized.

When the bleeding is slow or chronic, diagnostic testing and treatment may be managed in a community-based setting.

Diagnosis

Diagnostic testing focuses on determining the extent and effects of the bleed, as well as its cause.

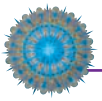
- A *complete blood count with hemoglobin and hematocrit* are obtained. In an acute bleed, the CBC, hemoglobin, and hematocrit may not initially indicate the extent of blood loss because plasma is lost along with blood cells.
- *Blood type and crossmatch* are performed to prepare for transfusion as necessary.
- *Serum electrolytes, osmolality*, and *BUN* are obtained to determine the effects of the blood loss and protein digestion on blood chemistries.
- *Liver function studies* and a *coagulation profile* may be obtained to help determine the cause of the bleeding.
- An *upper endoscopy* is performed as soon as possible to identify and, if possible, treat the source of bleeding. See Chapter 21 ∞ for nursing care of the client undergoing upper endoscopy.

Treatments

In acute GI hemorrhage, initial treatment focuses on stemming the bleeding and restoring cardiovascular stability. Intravenous fluids such as normal saline or a balanced electrolyte solution are administered through a large-bore intravenous catheter. Fresh whole blood, which contains clotting factors, is administered to restore blood volume and components in an acute hemorrhage. In less acute situations, packed red cells may be administered to restore the oxygen-carrying capacity of the blood.

Hemostasis is achieved using upper endoscopy whenever possible. A sclerosing agent may be injected into the bleeding vessel, or the vessel may be sealed using a heated probe, electrocautery, or laser. Rarely, emergency surgery is required to stop hemorrhage.

GASTRIC LAVAGE **Gastric lavage**, washing out of stomach contents, may be done in clients with upper GI hemorrhage to remove blood from the GI tract, prevent vomiting, and prepare for upper endoscopy. See Procedure 23–1 for nursing responsibilities related to gastric lavage.



NURSING CARE

Health Promotion

Preventing gastrointestinal bleeding is the most important step in reducing the mortality and morbidity associated with an acute GI hemorrhage. Identifying clients at risk and instituting regular gastric pH monitoring and maintenance of drug therapy to reduce gastric acidity are important preventive measures. All critically ill clients should be considered to be at risk for stress-related erosive gastritis.

Assessment

Assessment of the client experiencing an acute GI hemorrhage is very focused on the immediate crisis. The ability to obtain subjective information may be limited; however, it is important to identify possible contributing factors such as use of aspirin, other platelet inhibitors, or anticoagulant medications and the presence of any acute or chronic conditions that may contribute to bleeding (e.g., hypertension, a clotting disorder, peptic ulcer disease, chronic hepatitis, or cirrhosis of the liver). If possible, identify all current medications and their purpose, as well as any allergies to medications or other substances.

Physical examination focuses on the effect of the bleeding on cardiovascular status. Obtain vital signs and orthostatic vital signs (an early sign of hypovolemia). Place the acutely ill client on a cardiac monitor and obtain a rhythm strip. Obtain oxygen saturation level. Assess peripheral pulse strength, as well as color, temperature, and capillary refill of extremities. Evaluate mental status, including level of consciousness and orientation. An indwelling catheter may be inserted to evaluate urine output.

Nursing Diagnoses and Interventions

Nursing care priorities for the client with an acute GI bleed focus on restoring and maintaining an effective cardiac output and tissue perfusion, and on stopping the hemorrhage and preventing further bleeding.

Decreased Cardiac Output

Significant amounts of blood may be lost in a very short time with an acute GI hemorrhage. Because some of the blood enters the bowel, it may be difficult to accurately estimate the amount of blood lost by measuring emesis, gastric suction return, and blood expelled as feces. As blood volume drops, venous return decreases. The heart rate increases to maintain the cardiac output, and peripheral blood vessels constrict to improve venous return and cardiac output.

- Frequently assess and document vital signs, including blood pressure, pulse rate and cardiac rhythm, respiratory rate, and oxygen saturation levels. Obtain hemodynamic pressure measurements as ordered, reporting trends and changes. *The vital signs, oxygen saturation levels, and hemodynamic pressure values provide indicators of the effectiveness of peripheral tissue perfusion, oxygenation, and fluid replacement.*
- Monitor for and report changes in skin color, temperature, and moisture, or slow capillary refill. *Peripheral vasoconstriction and activation of the sympathetic nervous system typically cause pale, cool, and moist or diaphoretic skin. Development of cyanosis or mottling indicates a further decrease in tissue perfusion and oxygenation.*
- Insert an indwelling urinary catheter and measure urine output hourly. Report an output of less than 30 mL for two consecutive hours. *A fall in urine output may indicate further reduction in cardiac output. As cardiac output falls, the kidneys become ischemic and acute renal failure may develop.*
- Unless contraindicated, insert a nasogastric tube and connect to low suction. Measure gastric output hourly unless otherwise directed. *Measuring gastric output provides information about the amount of blood and fluid lost. This information helps determine fluid and blood replacement needs.*
- Maintain two peripheral intravenous lines with large-bore catheters or a central venous catheter for fluid and blood administration as ordered. Frequently monitor vital signs, respiratory status, and hemodynamic pressure measurements, reporting changes in status. *Rapid administration of isotonic intravenous fluids, blood, and blood products can lead to fluid overload and potential heart failure.*
- Replace gastric drainage with balanced electrolyte intravenous solutions as ordered. *GI losses are replaced in addition to fluids given to meet daily requirements to prevent fluid volume deficiency.*

Impaired Tissue Integrity: Gastrointestinal

- Maintain gastric suction and drainage and patency of nasogastric tube. *Blood is irritating to the GI tract, precipitating vomiting and stimulating peristalsis, leading to diarrhea. In addition, digested blood can increase BUN levels, potentially leading to confusion and altered mental status.*
- Irrigate the nasogastric tube with room temperature saline or tap water as ordered. Calculate intake and output, subtracting the amount of irrigant from gastric output. *Irrigation of the nasogastric tube helps remove irritating blood from the gut and produces a degree of vasoconstriction in stomach mucosa, slowing bleeding.*
- Prepare for upper endoscopy or surgery as planned. *Endoscopy or emergency surgery may be performed to repair the bleeding site or sclerose bleeding vessels.*
- Following an acute bleed and in clients at risk for GI bleeding, monitor gastric pH as ordered and check vomitus and feces for the presence of occult blood. Maintain infusions of drugs to reduce gastric acidity as ordered. *The client remains*

PROCEDURE 23-1 GASTRIC LAVAGE

When it is important to remove or dilute gastric contents rapidly, gastric lavage (irrigation or washing out of the stomach) may be indicated. In acute poisoning or ingestion of a caustic substance, a large-bore 30- to 36-Fre. nasogastric tube is inserted, and lavage performed. An 18-Fr. nasogastric tube may be used when the procedure is performed to remove blood from the upper GI tract. Because the GI tract is not sterile, clean technique is appropriate for use, although the solution used will generally be sterile.

- Obtain baseline assessment, including vital signs, abdominal inspection, girth, and bowel sounds. *It is important to have assessment data documented prior to instituting the procedure for comparison.*
- Explain the procedure, answering questions and clarifying perceptions. Instruct to report any pain, difficulty breathing, or other problems during the procedure. *A client who is able to understand and cooperate with the procedure will tolerate lavage better. The client may be aware of symptoms of complications such as perforation or tube displacement before they are evident to the nurse.*
- Place in semi-Fowler's or Fowler's position. If unable to tolerate elevation of the head of the bed because of hypotension, place in left side-lying position. *Elevating of the head of the bed or side-lying position will minimize the risk of aspiration.*
- Insert a nasogastric tube if one is not already in place. Verify tube placement by aspirating gastric contents and test pH of aspirate. *Proper placement is vital to prevent aspiration or overdistention of the small bowel with irrigating solution.*
- Irrigate the stomach, using either a closed or an open system technique.

CLOSED-SYSTEM IRRIGATION

- Wearing clean gloves, connect bag or bottle of normal saline irrigating solution to nasogastric tube using a Y connector. Attach drainage or suction tube to other arm of connector (Figure 23–7 ■). Empty the stomach, clamp drain tube or turn off suction, and allow 50 to 200 mL of solution to run into stomach by gravity. Stop solution and allow to drain or suction out. Repeat until ordered amount has been used or desired results are obtained, for example, no further clots and solution returns clear or light pink. Measure the amount of drainage, subtracting the amount of irrigant instilled, to obtain gastric output. *The closed system minimizes the risk of contact with body fluids for the nurse. Measuring gastric output is important in monitoring fluid balance.*

INTERMITTENT OPEN SYSTEM

- Wearing clean gloves and other personal protective equipment as necessary (gown and face protection), empty the stomach using suction or a 50-mL catheter-tip syringe. Measure and discard the aspirate. Using the syringe, draw up approximately 50 mL of irrigation solution, and instill it using gentle pressure. Aspirate the nasogastric tube, and discard the solution into a measuring container. Continue this procedure until the desired amount of irrigant or desired results have been obtained. *Manual irrigation with a catheter-tip syringe may be more effective than gravity flow in removing clots from the stomach and nasogastric tube.*
- Continue to monitor vital signs (including temperature), tolerance of the procedure, and other assessment data. *The client may be unstable and require continuous reevaluation. Gastric lavage may cause hypothermia; therefore, monitor temperature and indications of hypothermia, such as lethargy and changes in cardiac rate and rhythm.*
- If the aspirate has not cleared to light pink or pink tinged after 20 to 30 minutes of lavage or if the client is unable to tolerate the procedure, notify the physician. *Medical or surgical intervention may be necessary to stop hemorrhage in some instances.*
- On completion of lavage, provide mouth and nares care. Continue to monitor vital signs, abdominal status, and other assessment data.
- Document the procedure, including the amount and type of irrigant used, gastric output character and amount, and the client's condition and tolerance of the procedure.

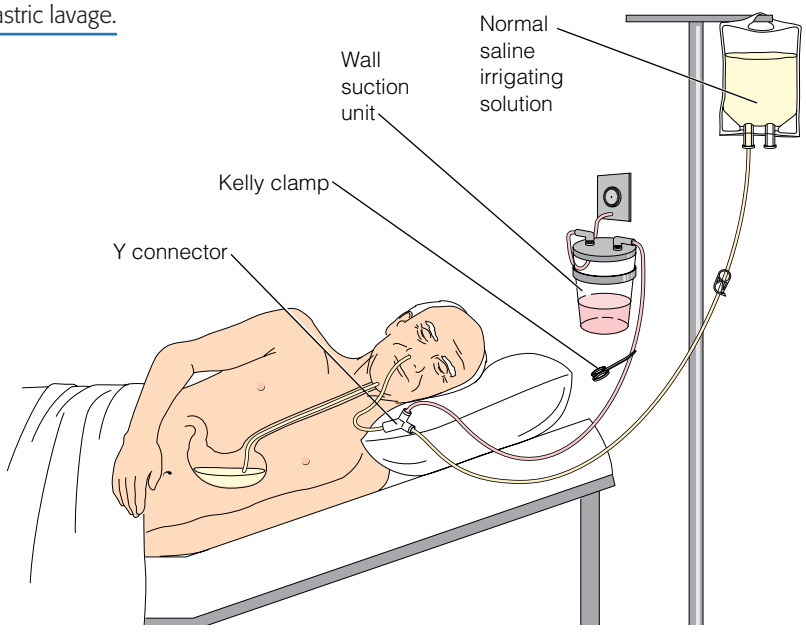


Figure 23–7 ■ The client with a closed-system gastric lavage.

at risk for GI bleeding. Monitoring for occult blood helps identify slow bleeding or recurrent hemorrhage. Reducing the acidity of gastric secretions reduces irritation of the gastric mucosa, reducing the risk of bleeding.

Community-Based Care

Following an acute GI hemorrhage, continuing care focuses on resolving the underlying disease process if possible and preventing future episodes of GI bleeding. If a bleeding gastric ulcer was identified, testing for *H. pylori* infection will be done, and a treatment regimen prescribed to eradicate the infection (see the section on peptic ulcer disease later in this chapter). The client who experienced an episode of erosive stress gastritis will often be discharged with instructions to continue taking a gastric acid–reducing medication and avoid known gastric irritants such as aspirin and alcohol. The client with esophageal varices due to cirrhosis or chronic hepatitis needs additional instructions. See Chapter 24 ∞.

Clients with minor or slow GI bleeding often are managed in the community. Provide teaching about the cause of the bleeding and measures to prevent future episodes. Provide verbal and written instructions for prescribed medications such as acid reducers and oral iron supplements. Discuss appropriate nutrition; while a special diet to "soothe the stomach" rarely is indicated, foods rich in iron may be recommended to treat the resulting anemia.

Discuss indicators of GI bleeding to be reported to the physician. If the source of bleeding has not been identified, provide instructions about prescribed follow-up diagnostic testing.

THE CLIENT WITH GASTRITIS

Gastritis, inflammation of the stomach lining, results from irritation of the gastric mucosa. Gastritis is common, and may be caused by a variety of factors. The most common form of gastritis, **acute gastritis**, is generally a benign, self-limiting disorder associated with the ingestion of gastric irritants such as aspirin, alcohol, caffeine, or foods contaminated with certain bacteria. Manifestations of acute gastritis may range from asymptomatic to mild heartburn to severe gastric distress, vomiting, and bleeding with hematemesis (vomiting blood).

Chronic gastritis is a separate group of disorders characterized by progressive and irreversible changes in the gastric mucosa (Porth, 2005). Chronic gastritis is more common in the elderly, chronic alcoholics, and cigarette smokers. When symptoms of chronic gastritis occur, they are often vague, ranging from a feeling of heaviness in the epigastric region after meals to gnawing, burning, ulcer-like epigastric pain unrelieved by antacids.

Pathophysiology

Acute Gastritis

Acute gastritis is characterized by disruption of the mucosal barrier by a local irritant. This disruption allows hydrochloric acid and pepsin to come into contact with the gastric tissue, resulting in irritation, inflammation, and superficial erosions. The gastric mucosa rapidly regenerates, generally making acute gastritis a self-limiting disorder, with resolution and healing occurring within several days.

The ingestion of aspirin or other NSAIDs, corticosteroids, alcohol, and caffeine is commonly associated with the development of acute gastritis. Accidental or purposeful ingestion of a corrosive alkali (such as ammonia, lye, Lysol, and other cleaning agents) or acid leads to severe inflammation and possible necrosis of the stomach. Gastric perforation, hemorrhage, and peritonitis are possible results. Iatrogenic causes of acute gastritis include radiation therapy and administration of certain chemotherapeutic agents.

Erosive Gastritis

A severe form of acute gastritis, **erosive** or **stress-induced gastritis**, occurs as a complication of other life-threatening conditions such as shock, severe trauma, major surgery, sepsis, burns, or head injury. When these erosions follow a major burn, they are called **Curling's ulcers**, after Thomas Curling, a British physician, who first described them in 1842. When stress ulcers occur following head injury or CNS surgery, they are referred to as **Cushing's ulcers**, after Harvey Cushing, a U.S. surgeon.

The primary mechanisms leading to erosive gastritis appear to be ischemia of the gastric mucosa resulting from sympathetic vasoconstriction, and tissue injury due to gastric acid. As a result, multiple superficial erosions of the gastric mucosa develop. Maintaining the gastric pH at greater than 3.5 and inhibiting gastric acid secretion with medications help prevent erosive gastritis.

MANIFESTATIONS The client with acute gastritis may have mild symptoms such as **anorexia** (loss of appetite), or mild epigastric discomfort relieved by belching or defecating. More severe manifestations include abdominal pain, nausea, and vomiting. Gastric bleeding may occur, with hematemesis or melena (black, tarry stool that contains blood). Erosive gastritis is not typically associated with pain. The initial symptom often is painless gastric bleeding occurring 2 or more days after the initial stressor. Bleeding typically is minimal, but can be massive. Corrosive gastritis can cause severe bleeding, signs of shock, and an *acute abdomen* (severely painful, rigid, boardlike abdomen) if perforation occurs. See the Manifestations box below.

MANIFESTATIONS of Acute and Chronic Gastritis

ACUTE GASTRITIS

Gastrointestinal
- Anorexia
- Nausea and vomiting
- Hematemesis
- Melena
- Abdominal pain

Systemic
- Possible shock

CHRONIC GASTRITIS

Gastrointestinal
- Vague discomfort after eating; may be asymptomatic

Systemic
- Anemia
- Fatigue

Chronic Gastritis

Unrelated to acute gastritis, chronic gastritis is a progressive disorder that begins with superficial inflammation and gradually leads to atrophy of gastric tissues. The initial stage is characterized by superficial changes in the gastric mucosa and a decrease in mucus. As the disease evolves, glands of the gastric mucosa are disrupted and destroyed. The inflammatory process involves deep portions of the mucosa, which thins and atrophies. There appear to be at least two different forms of chronic gastritis, classified as type A and type B.

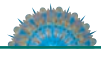
Type A gastritis, the less common form of chronic gastritis, usually affects people of Northern European heritage. This type of gastritis is thought to have an autoimmune component. In type A or autoimmune gastritis, the body produces antibodies to parietal cells and to intrinsic factor. These antibodies destroy gastric mucosal cells, resulting in tissue atrophy and the loss of hydrochloric acid and pepsin secretion. Because intrinsic factor is required for the absorption of vitamin B_{12}, this immune response also results in pernicious anemia. For further discussion of pernicious anemia, see Chapter 34 ∞.

Type B gastritis is the more common form of chronic gastritis. Its incidence increases with age, reaching nearly 100% in people over the age of 70. Type B gastritis is caused by chronic infection of the gastric mucosa by *H. pylori*, a gram-negative spiral bacterium. *H. pylori* infection causes inflammation of the gastric mucosa, with infiltration by neutrophils and lymphocytes. The outermost layer of gastric mucosa thins and atrophies, providing a less effective barrier against the autodigestive properties of hydrochloric acid and pepsin.

Infection with *H. pylori* also is associated with an increased risk for peptic ulcer disease. *H. pylori* infection significantly increases the risk of developing gastric cancer. See the sections that follow for more information about these disorders.

MANIFESTATIONS Chronic gastritis is often asymptomatic until atrophy is sufficiently advanced to interfere with digestion and gastric emptying. The client may complain of vague gastric distress, epigastric heaviness after meals, or ulcer-like symptoms. These symptoms typically are not relieved by antacids. In addition, the client may experience fatigue and other symptoms of anemia. If intrinsic factor is lacking, paresthesias and other neurologic manifestations of vitamin B_{12} deficiency may be present. See the Manifestations box on previous page.

INTERDISCIPLINARY CARE



Acute gastritis is usually diagnosed by the history and clinical presentation. In contrast, the vague symptoms of chronic gastritis may require more extensive diagnostic testing.

Clients with acute and chronic gastritis are generally managed in community settings. The client requires acute care only when nausea and vomiting are severe enough to interfere with normal fluid and electrolyte balance and nutritional status. If hemorrhage results, surgical intervention may be required.

Diagnosis

Diagnostic tests that may be ordered for the client with gastritis include the following:

- *Gastric analysis* to assess hydrochloric acid secretion. A nasogastric tube is passed into the stomach, and pentagastrin is injected subcutaneously to stimulate gastric secretion of hydrochloric acid. Secretion may be decreased in clients with chronic gastritis.
- *Hemoglobin, hematocrit,* and *red blood cell (RBC) indices* are evaluated for evidence of anemia. The client with gastritis may develop pernicious anemia because of parietal cell destruction, or iron-deficiency anemia because of chronic blood loss.
- *Serum vitamin B_{12} levels* are measured to evaluate for possible pernicious anemia. Normal values for vitamin B_{12} are 200 to 1000 pg/mL, with lower levels seen in older adults.
- *Upper endoscopy* may be done to inspect the gastric mucosa for changes, identify areas of bleeding, and obtain tissue for biopsy. Bleeding sites may be treated with electro- or laser coagulation or injected with a sclerosing agent during the procedure. See the Diagnostic Tests box on page 615 in Chapter 21 ∞ for client preparation and teaching related to an upper endoscopy.

Medications

Drugs such as a PPI, H_2-receptor blocker, or sucralfate may be ordered to prevent or treat acute stress gastritis. PPIs and H_2-receptor blockers reduce the amount or effects of hydrochloric acid on the gastric mucosa. Lansoprazole (Prevacid), esomeprazole (Nexium), and omeprazole (Prilosec) are examples of PPIs. H_2-receptor blockers include cimetidine (Tagamet), ranitidine (Zantac), famotidine (Pepcid), and nizatidine (Axid). These drugs also are available in nonprescription strength. Sucralfate (Carafate) works locally to prevent the damaging effects of acid and pepsin on gastric tissue. It does not neutralize or reduce acid secretion. Nursing implications for drugs commonly used in managing gastritis are included in the Medication Administration box on pages 665–666.

The client with type B chronic gastritis may be treated to eradicate the *H. pylori* infection. This generally involves combination therapy consisting of two antibiotics (such as metronidazole and clarithromycin or tetracycline) and a PPI. In some cases, eradication of the infection is not warranted, and the client is treated symptomatically.

Treatments

In acute gastritis, gastrointestinal tract rest is provided by 6 to 12 hours of NPO status, then slow reintroduction of clear liquids (broth, tea, gelatin, carbonated beverages), followed by ingestion of heavier liquids (cream soups, puddings, milk), and finally a gradual reintroduction of solid food.

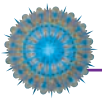
If nausea and vomiting threaten fluid and electrolyte balance, intravenous fluids and electrolytes are ordered.

GASTRIC LAVAGE Acute gastritis resulting from ingestion of a poisonous or corrosive substance (acid or strong alkali) is treated with immediate dilution and removal of the substance.

Vomiting is not induced because it might further damage the esophagus and possibly the trachea; instead, gastric lavage, washing out of the stomach contents, is performed. See Procedure 23–1.

COMPLEMENTARY THERAPIES Complementary therapies such as herbal remedies or aromatherapy may be appropriate to recommend for clients with gastritis. Refer the client to a healthcare provider trained in natural and herbal remedies or to an aromatherapist for an individualized treatment plan. Recommendations may include:

- Chamomile tea or the essential oil used in aromatherapy
- Garlic; one clove chopped fine and taken daily at bedtime
- Ginger, powdered or in capsules or made into a tea taken before or after meals
- Mint oil aromatherapy via a diffuser, in a bath, or diluted with a carrier oil and used for a soothing massage.



NURSING CARE

Health Promotion

Teach all clients and community members about measures to prevent acute gastritis. Food contaminated with bacteria is a significant cause of acute gastritis. Discuss food safety measures such as fully cooking meats and egg products, and promptly refrigerating foods after cooking to avoid bacterial growth. Stress that food contaminated with potential pathogens often looks, smells, and tastes good, making it difficult to identify. Teach clients to abstain from eating or drinking anything during an acute episode of vomiting, then reintroduce clear liquids gradually once vomiting has stopped (2 to 4 hours after the last episode of vomiting). Suggest using liquids such as Pedialyte or a sport drink to replace lost electrolytes and fluid. Instruct clients to avoid milk and milk products until they easily tolerate clear liquids and solid foods such as dry toast or saltine crackers.

Assessment

Assessment data to collect for clients with acute or chronic gastritis include the following:

- *Health history:* Current symptoms and their duration; relieving and aggravating factors; history of ingestion of toxins, contaminated food, alcohol, aspirin, or NSAIDs; other medications.
- *Physical examination:* Vital signs including orthostatic vitals if indicated; peripheral pulses; general appearance; abdominal assessment including appearance, bowel sounds, and tenderness.

Nursing Diagnoses and Interventions

In planning and implementing nursing care for the client with acute or chronic gastritis, consider both the direct effects of the disorder on the gastrointestinal system and nutritional status as well as its effects on lifestyle and psychosocial integrity. This section focuses on problems of fluid balance and nutrition.

Deficient Fluid Volume

Nausea, vomiting, and abdominal distress are the primary manifestations of acute gastritis. The risk for fluid and electrolyte imbalance is high because of inadequate intake of food and fluids, and abnormal losses of fluids and electrolytes with vomiting.

- Monitor and record vital signs at least every 2 hours until stable, then every 4 hours. Check for orthostatic hypotension.

PRACTICE ALERT

Tachycardia, tachypnea, and hypotension, especially orthostatic hypotension, may indicate fluid volume deficit. Electrolyte or acid–base imbalances resulting from vomiting may cause cardiac dysrhythmias or changes in respirations.

- Weigh daily. Monitor and record intake and output; record urine output every 1 to 4 hours as indicated. *Daily weights are an accurate indicator of fluid volume. Urine output of less than 30 mL per hour indicates decreased cardiac output and a need for prompt fluid replacement.*
- Monitor skin turgor, color, and condition and status of oral mucous membranes frequently. Provide skin and mouth care frequently. *Skin turgor and mucous membrane assessments indicate hydration status. Good skin and mouth care are necessary to maintain skin and mucous membrane integrity.*
- Monitor laboratory values for electrolytes and acid–base balance. Report significant changes or deviations from normal. *Electrolytes are lost through vomiting, increasing the risk of electrolyte and acid–base imbalances. These imbalances, in turn, affect multiple body systems.*
- Administer oral or parenteral fluids as ordered. *Oral fluids may be withheld until vomiting has ceased, then gradually reintroduced. Intravenous fluids restore or maintain hydration until adequate oral intake is resumed.*
- Administer antiemetic and other drugs as ordered to relieve vomiting and facilitate oral feeding. Encourage fluids as soon as feasible. *The oral route is preferred for fluid and nutrient intake; medications may be used to allow earlier resumption of feeding.*

PRACTICE ALERT

Ensure safety: Place call light within reach, put up the side rails, instruct client to avoid getting up without assistance. Orthostatic hypotension may lead to syncope and to falls if the client attempts to get up without assistance.

Imbalanced Nutrition: Less than Body Requirements

Manifestations of chronic gastritis may lead to reduced food intake and malnutrition. The client often associates these unpleasant sensations with eating, and may gradually reduce food intake. Associated anorexia also contributes to poor food intake.

- Monitor and record food and fluid intake and any abnormal losses (such as vomiting). *Careful monitoring can help in developing a dietary plan to meet the caloric needs of the client.*

- Monitor weight and laboratory studies such as serum albumin, hemoglobin, and RBC indices. *Weights and laboratory values provide data regarding nutritional status and the effectiveness of interventions.*
- Arrange for dietary consultation to determine caloric and nutrient needs and develop a dietary plan. Consider food preferences and tolerances in menu planning. *A diet high in protein, vitamins, and minerals may be prescribed to meet nutritional needs of the client with chronic gastritis. In addition, specific food intolerances may need to be considered. Planning to include preferred foods in the diet helps ensure consumption of the prescribed diet.*
- Provide nutritional supplements between meals or frequent small feedings as needed. *Many clients with chronic gastritis tolerate small, frequent feedings better than three large meals per day.*
- Maintain tube feedings or parenteral nutrition as ordered. Refer to Chapter 22 ∞ for further information on enteral and parenteral feedings.

Community-Based Care

Because acute or chronic gastritis is usually managed in community-based settings, teaching is vital. For the client with acute gastritis, teaching focuses on managing acute symptoms, reintroducing fluids and solid foods, identifying indicators of possible complications (e.g., continued vomiting, signs of fluid and electrolyte imbalance), and preventing future episodes.

Provide the following information for clients with chronic gastritis:

- Maintaining optimal nutrition
- Helpful dietary modifications
- Using prescribed medications
- Avoiding known gastric irritants, such as aspirin, alcohol, and cigarette smoking.

Referral to smoking cessation classes or programs to treat alcohol abuse may be necessary.

THE CLIENT WITH PEPTIC ULCER DISEASE

Peptic ulcer disease (PUD), a break in the mucous lining of the gastrointestinal tract where it comes in contact with gastric juice, is a chronic health problem. PUD affects approximately 10% of the population or 4 million people in the United States every year (Kasper et al., 2005; Tierney et al., 2005).

Peptic ulcers occur in any area of the gastrointestinal tract exposed to acid-pepsin secretions, including the esophagus, stomach, or duodenum. **Duodenal ulcers** are the most common. They usually develop between the ages of 30 and 55, and are more common in men than women. **Gastric ulcers** more often affect older clients, between the ages of 55 and 70. Ulcers are more common in people who smoke and who are chronic users of NSAIDs. Alcohol and dietary intake do not seem to cause PUD, and the role of stress is uncertain. Although the incidence of PUD has dramatically decreased, the incidence of gastric ulcers is increasing, believed due to the widespread use of NSAIDs (Tierney et al., 2005).

MEDIALINK Case Study: Peptic Ulcer Disease

Risk Factors

Chronic *H. pylori* infection and use of aspirin and NSAIDs are the major risk factors for PUD. Contributing risk factors are listed in Box 23–4. Overall, an estimated one in six clients infected with *H. pylori* develops PUD. Of the NSAIDs, aspirin is the most ulcerogenic. A strong familial pattern suggests a genetic factor in the development of PUD. Cigarette smoking is a significant risk factor, doubling the risk of PUD. Cigarette smoking inhibits the secretion of bicarbonate by the pancreas and possibly causes more rapid transit of gastric acid into the duodenum.

Pathophysiology

The innermost layer of the stomach wall, the gastric mucosa, consists of columnar epithelial cells, supported by a middle layer of blood vessels and glands, and a thin outer layer of smooth muscle. The mucosal barrier of the stomach, a thin coating of mucous gel and bicarbonate, protects the gastric mucosa. The mucosal barrier is maintained by bicarbonate secreted by the epithelial cells, by mucous gel production stimulated by prostaglandins, and by an adequate blood supply to the mucosa (see the overview of normal physiology on page 671).

An **ulcer**, or break in the gastrointestinal mucosa, develops when the mucosal barrier is unable to protect the mucosa from damage by hydrochloric acid and pepsin, the gastric digestive juices. See the accompanying *Pathophysiology Illustrated: Peptic Ulcer Disease* on pages 682–683.

H. pylori infection, found in about 70% of people who have PUD, is unique in colonizing the stomach. It is spread person to person (oral–oral or fecal–oral), and contributes to ulcer formation in several ways. The bacteria produce enzymes that reduce the efficacy of mucous gel in protecting the gastric mucosa. In addition, the host's inflammatory response to *H. pylori* contributes to gastric epithelial cell damage without producing immunity to the infection. Although the gastric mucosa is the usual site for *H. pylori* infection, this infection also contributes to duodenal ulcers. This is possibly related to increased gastric acid production associated with *H. pylori* infection.

NSAIDs contribute to PUD through both systemic and topical mechanisms. Prostaglandins are necessary for maintaining the gastric mucosal barrier. NSAIDs interrupt prostaglandin

BOX 23–4 Risk Factors for Peptic Ulcer Disease

- *H. pylori* infection
  - Low socioeconomic status
  - Crowded, unsanitary living conditions
  - Unclean food or water
- Use of NSAIDs
- Advanced age
- History of ulcer
- Concurrent use of other drugs such as glucocorticoids or other NSAIDs
- Cigarette smoking
- Family history of PUD

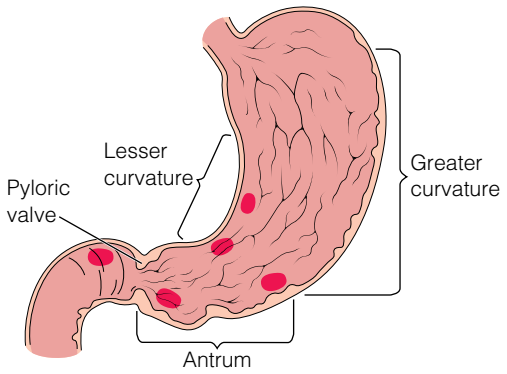


Figure 23–8 ■ Common sites affected by peptic ulcer disease.

synthesis by disrupting the action of the enzyme cyclooxygenase (COX). The two forms of this enzyme are COX-1 and COX-2. The COX-1 enzyme is necessary to maintain the integrity of the gastric mucosa, but the anti-inflammatory effects of NSAIDs are due to their ability to inhibit the COX-2 enzyme. The COX-2–selective NSAIDs may be less damaging to the gastric mucosa because they have less effect on the COX-1 enzyme. In addition to their systemic effect, aspirin and many NSAIDs cross the lipid membranes of gastric epithelial cells, damaging the cells themselves.

The ulcers of PUD may affect the esophagus, stomach, or duodenum. They may be superficial or deep, affecting all layers of the mucosa (see *Pathophysiology Illustrated: Peptic Ulcer Disease*). Duodenal ulcers, the most common, usually develop in the proximal portion of the duodenum, close to the pylorus (Figure 23–8 ■). They are sharply demarcated and usually less than 1 cm in diameter (Figure 23–9 ■). Gastric ulcers often are found on the lesser curvature and the area immediately proximal to the pylorus. Gastric ulcers are associated with an increased incidence of gastric cancer.

Peptic ulcer disease may be chronic, with spontaneous remissions and exacerbations. Exacerbations of the disease may be associated with trauma, infection, or other physical or psychologic stressors.

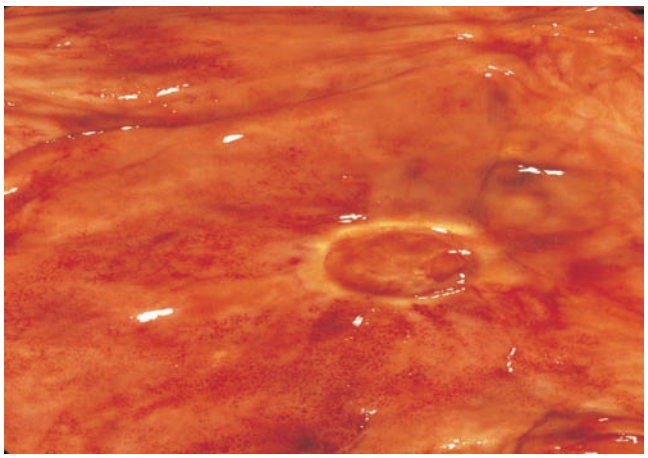


Figure 23–9 ■ A superficial peptic ulcer.
Source: SPL/Photo Researchers, Inc.

Manifestations

Pain is the classic symptom of peptic ulcer disease. The pain is typically described as gnawing, burning, aching, or hunger-like and is experienced in the epigastric region, sometimes radiating to the back. The pain occurs when the stomach is empty (2 to 3 hours after meals and in the middle of the night) and is relieved by eating with a classic "pain–food–relief" pattern. The client may complain of heartburn or regurgitation and may vomit.

The presentation of peptic ulcer disease in the older adult is often less clear, with vague and poorly localized discomfort, perhaps chest pain or dysphagia, weight loss, or anemia. In the older adult, a complication of PUD such as upper GI hemorrhage or perforation of the stomach or duodenum may be the presenting symptom.

Complications

The complications associated with peptic ulcers include hemorrhage, obstruction, and perforation. See the box below for the manifestations of these complications.

Among people with PUD, 10% to 20% experience **hemorrhage** as a result of ulceration and erosion into the blood vessels of the gastric mucosa. In the older adult, bleeding is the most frequent complication. When small blood vessels erode, blood loss may be slow and insidious, with occult blood in the stool the only initial sign. If bleeding continues, the client becomes anemic and experiences symptoms of weakness, fatigue, dizziness, and orthostatic hypotension. Erosion into a larger vessel can lead to sudden and severe bleeding with hematemesis, melena, or hematochezia (blood in the stool), and signs of hypovolemic shock.

MANIFESTATIONS of PUD Complications

HEMORRHAGE
- Occult or obvious blood in the stool
- Hematemesis
- Fatigue
- Weakness, dizziness
- Orthostatic hypotension
- Hypovolemic shock

OBSTRUCTION
- Sensations of epigastric fullness
- Nausea and vomiting
- Electrolyte imbalances
- Metabolic alkalosis

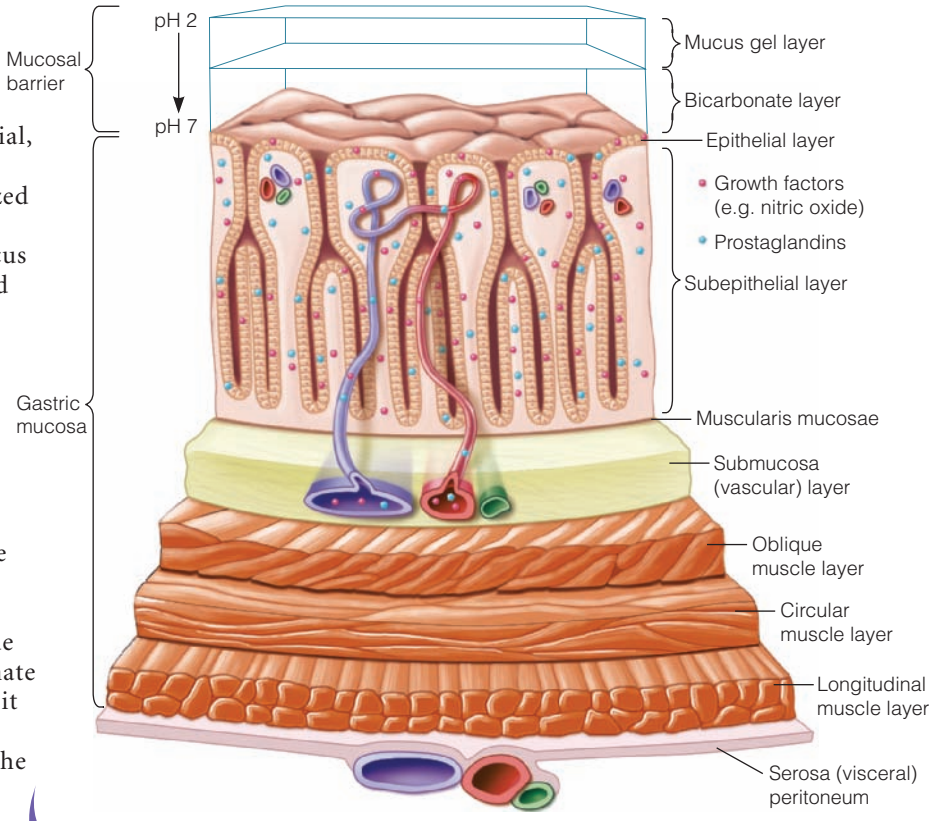
PERFORATION
- Severe upper abdominal pain, radiating to the shoulder
- Rigid, boardlike abdomen
- Absence of bowel sounds
- Diaphoresis
- Tachycardia
- Rapid, shallow respirations
- Fever

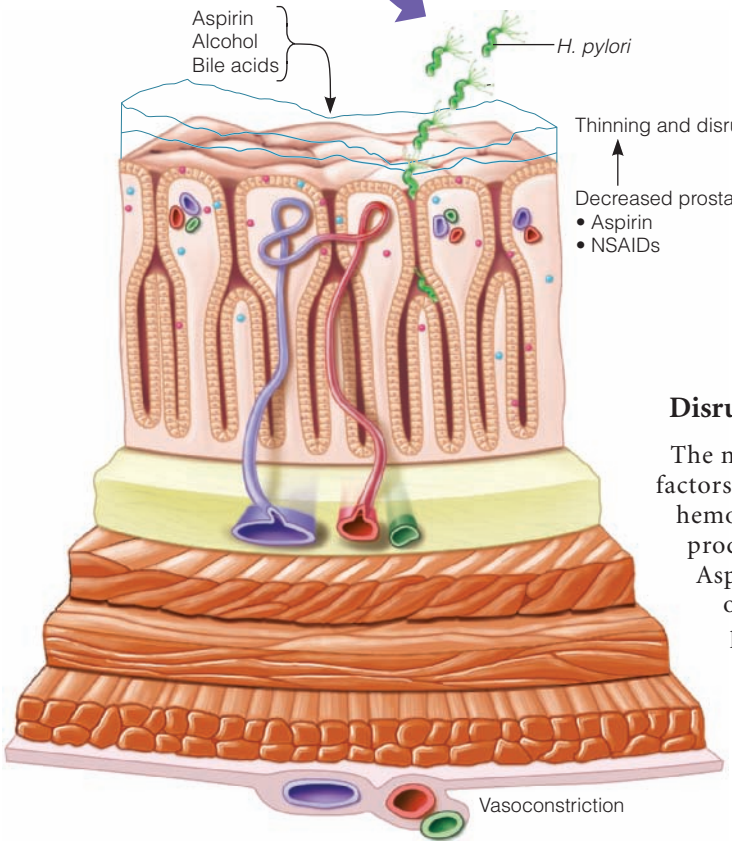
PATHOPHYSIOLOGY ILLUSTRATED

Peptic Ulcer Disease

Normal gastric mucosa

In the stomach and duodenum, the mucosal barrier protects the gastric mucosa (including the epithelial, vascular, and smooth muscle layers) from damage. Specialized mucous cells throughout the gastric mucosa produce a mucus (a mixture of water, lipids, and glycoproteins) that serves as a barrier to the diffusion of ions (such as hydrogen ion) and molecules (such as pepsin). A thin layer of bicarbonate, secreted by surface epithelial cells, forms between the mucus and cell membranes. Blood flow to the gastric mucosa is vital to maintain this barrier. Prostaglandins and nitric oxide stimulate mucus and bicarbonate production, helping maintain it as well. The mucosal barrier constantly bathes surfaces of the gastric epithelial lining.





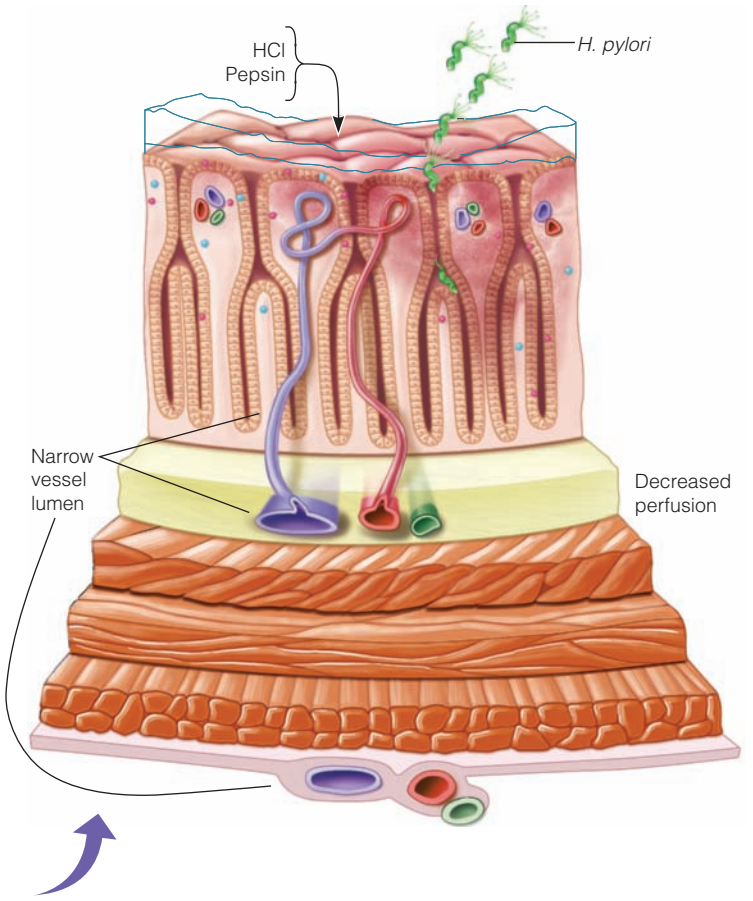
Thinning and disruption of mucosal barrier

Decreased prostaglandins due to
- Aspirin
- NSAIDs

Ischemia due to
- Hemorrhage
- Hypotension
- Shock

Disruption of mucosal barrier

The mucosal barrier can be disrupted by a number of factors. Ischemia of the gastric mucosa (e.g., due to hemorrhage, hypotension, or shock) impairs mucous production, increasing the risk of damage to the mucosa. Aspirin disrupts the mucosal barrier, and, along with other nonsteroidal anti-inflammatory drugs, inhibits prostaglandins which are necessary to maintain mucous production. Alcohol and bile acids also damage the mucous barrier. *Helicobacter pylori*, a common pathogen to infect the gastric mucosa, disrupts the mucosal barrier.

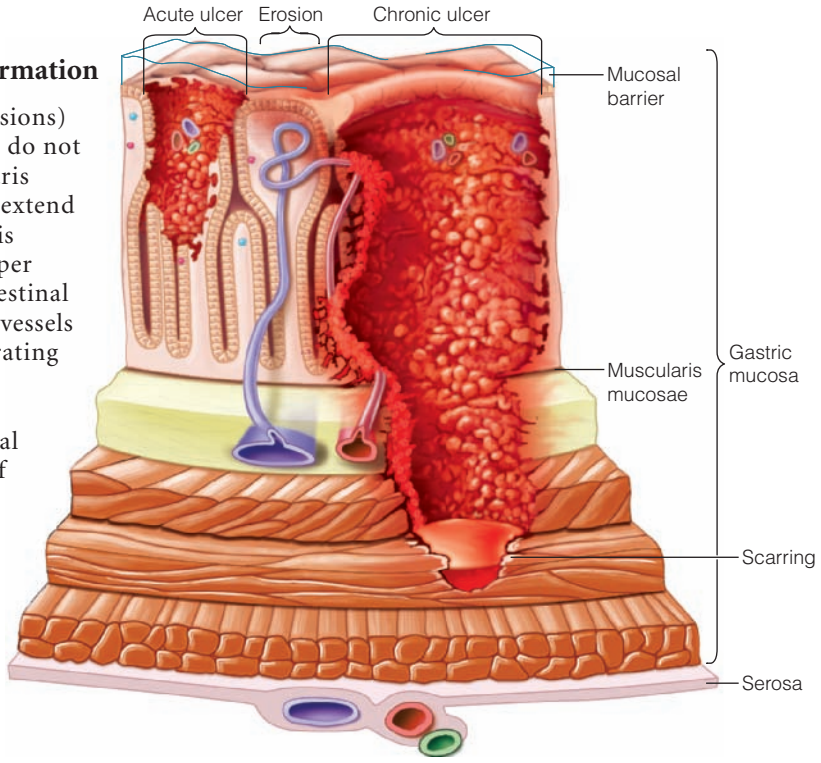


Inflammatory process

When the mucosal barrier is damaged, gastric acid and digestive juices disrupt the epithelial cell membranes, allowing acid to diffuse into cell walls. An acute inflammatory process results. Gastric epithelial cells migrate to the damaged area, a process known as restitution. Adequate blood flow and an alkaline environment are necessary for this repair process. Prostaglandins play an important role in epithelial repair. In the presence of *H. pylori* infection, excess acid production, inadequate blood flow, inhibition of prostaglandins, and other factors that are less clear, the inflammatory process further damages gastric and duodenal epithelial cells, leading to ulceration of the mucosa.

Erosion and ulcer formation

Superficial ulcers (erosions) erode the mucosa, but do not penetrate the muscularis mucosae. True ulcers extend through the muscularis mucosae and into deeper layers of the gastrointestinal wall, damaging blood vessels and potentially penetrating the entire wall. Hemorrhage and peritonitis are potential acute complications of peptic ulcers.



Gastric outlet obstruction may result from edema surrounding the ulcer, smooth muscle spasm, or scar tissue. Generally, obstruction is a gradual rather than an acute process. Symptoms include a feeling of epigastric fullness, accentuated ulcer symptoms, and nausea. If the obstruction becomes complete, vomiting occurs. Hydrochloric acid, sodium, and potassium are lost in vomitus, potentially leading to fluid and electrolyte imbalance and metabolic alkalosis.

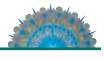
The most lethal complication of PUD is **perforation** of the ulcer through the mucosal wall. When perforation occurs, gastric or duodenal contents enter the peritoneum, causing an inflammatory process and peritonitis. Chemical peritonitis from the hydrochloric acid, pepsin, bile, and pancreatic fluid is immediate; bacterial peritonitis follows within 6 to 12 hours from gastric contaminants entering the normally sterile peritoneal cavity. When an ulcer perforates, the client has immediate, severe upper abdominal pain, radiating throughout the abdomen and possibly to the shoulder. The abdomen becomes rigid and boardlike, with absent bowel sounds. Signs of shock may be present, including diaphoresis, tachycardia, and rapid, shallow respirations. Classic symptoms of perforation may not be present in an older adult. The older adult may instead present with mental confusion and other nonspecific symptoms. This atypical presentation can lead to delays in diagnosis and treatment, increasing the associated mortality rate.

Zollinger-Ellison Syndrome

Zollinger-Ellison syndrome is peptic ulcer disease caused by a gastrinoma, or gastrin-secreting tumor of the pancreas, stomach, or intestines. Gastrinomas may be benign, although 50% to 70% are malignant tumors. Gastrin is a hormone that stimulates the secretion of pepsin and hydrochloric acid. The increased gastrin levels associated with these tumors result in hypersecretion of gastric acid, which in turn causes mucosal ulceration.

The peptic ulcers of Zollinger-Ellison syndrome may affect any portion of the stomach or duodenum, as well as the esophagus or jejunum. Characteristic ulcer-like pain is common. The high levels of hydrochloric acid entering the duodenum may also cause diarrhea and **steatorrhea** (excess fat in the feces) from impaired fat digestion and absorption. Complications of bleeding and perforation are often seen with Zollinger-Ellison syndrome. Fluid and electrolyte imbalances may also result from persistent diarrhea with resultant losses of potassium and sodium in particular.

INTERDISCIPLINARY CARE



Treatment for PUD focuses on eradicating *H. pylori* infection and treating or preventing ulcers related to use of NSAIDs.

Diagnosis

- *Upper GI series* using barium as a contrast medium can detect 80% to 90% of peptic ulcers. It commonly is the diagnostic procedure chosen first; it is less costly and less invasive than gastroscopy. Small or very superficial ulcers may be missed, however.
- *Gastroscopy* allows visualization of the esophageal, gastric, and duodenal mucosa and direct inspection of ulcers. Tissue also can be obtained for biopsy. Nursing care of the client undergoing a gastroscopy is outlined in Chapter 21 ∞.
- Biopsy specimens obtained during a gastroscopy can be tested for the presence of *H. pylori* using several different methods. In the *biopsy urease test,* the specimen is put into a gel containing urea. If *H. pylori* is present, the urease that it produces changes the color of the gel, often within minutes. Biopsy specimen cells also can be microscopically examined or cultured for evidence of *H. pylori.* Although these tests are highly specific for *H. pylori* infection, their invasiveness, cost, and lack of availability in some areas limits their usefulness.
- Noninvasive methods of detecting *H. pylori* infection include *serologic testing* (to detect IgG antibodies through ELISA), fecal antigen immunoassays (to detect antigens to *H. pylori* in the feces), and the *urea breath test.* In this test, radiolabeled urea is given orally. The urease produced by *H. pylori* bacteria converts the urea to ammonia and radiolabeled carbon dioxide, which can then be measured as the client exhales. This test, as well as fecal antigen testing, also can be used to evaluate the effectiveness of treatment to eradicate *H. pylori.* Treatment with PPIs interferes with urea breath test and fecal antigen test results, so these drugs should be discontinued for 1 to 2 weeks prior to testing (Tierney et al., 2005).
- If Zollinger-Ellison syndrome is suspected, *gastric analysis* may be performed to evaluate gastric acid secretion. Stomach contents are aspirated through a nasogastric tube and analyzed. In Zollinger-Ellison syndrome, gastric acid levels are very high.

Medications

The medications used to treat PUD include agents to eradicate *H. pylori,* drugs to decrease gastric acid content, and agents that protect the mucosa. Nursing responsibilities related to selected drugs to treat GERD, gastritis, and PUD are found in the Medication Administration box on pages 665–666.

Eradication of *H. pylori* is often difficult. Combination therapies that use two antibiotics with a proton-pump inhibitor (e.g., combinations of a PPI, clarithromycin, and amoxicillin, or a PPI, bismuth subsalicylate, tetracycline, and metronidazole) are necessary. With complete eradication of *H. pylori,* reinfection rates are less than 0.5% per year.

In clients who have NSAID-induced ulcers, the NSAID in use should be discontinued if at all possible. If this is not possible, twice-daily PPIs enable ulcer healing.

Medications that decrease gastric acid content include PPIs and the H_2-receptor antagonists.

- Proton-pump inhibitors bind the acid-secreting enzyme (H^+, K^+ ATPase) that functions as the proton pump, disabling it for up to 24 hours. These drugs are very effective, resulting in more than 90% ulcer healing after 4 weeks. Compared to the H_2-receptor blockers, the PPIs provide faster pain relief and more rapid ulcer healing.
- Histamine$_2$-receptor blockers inhibit histamine binding to the receptors on the gastric parietal cells to reduce acid secretion. These drugs are very well tolerated and have few serious side effects; however, drug interactions can occur. These drugs must be continued for 8 weeks or longer for ulcer healing.

Agents that protect the mucosa include sucralfate, bismuth, antacids, and prostaglandin analogs.

- Sucralfate binds to proteins in the ulcer base, forming a protective barrier against acid, bile, and pepsin. Sucralfate also stimulates the secretion of mucus, bicarbonate, and prostaglandin.
- Bismuth compounds (Pepto-Bismol) stimulate mucosal bicarbonate and prostaglandin production to promote ulcer healing. In addition, bismuth has an antibacterial action against *H. pylori.* There are very few side effects, other than a harmless darkening of stools.
- Antacids stimulate gastric mucosal defenses, thereby aiding in ulcer healing. They provide rapid relief of ulcer symptoms, and are often used as needed to supplement other antiulcer medications. Antacids are inexpensive, but clients often have difficulty with a regular regimen because the drugs must be taken frequently and may cause either constipation (from the aluminum-type antacids) or diarrhea (from the magnesium-based antacids). Antacids also interfere with the absorption of iron, digoxin, some antibiotics, and other drugs.
- Prostaglandin analogs (misoprostol) promote ulcer healing by stimulating mucus and bicarbonate secretions and by inhibiting acid secretion. Although not as effective as the other drugs discussed, misoprostol is used to prevent NSAID-induced ulcers.

Treatments

NUTRITION In addition to pharmacologic treatment, clients are encouraged to maintain good nutrition, consuming balanced meals at regular intervals. It is important to teach clients that bland or restrictive diets are no longer necessary. Mild alcohol intake is not harmful. Smoking should be discouraged, because it slows the rate of healing and increases the frequency of relapses.

SURGERY The identification of *H. pylori* as a cause of PUD and the availability of drugs to treat the infection and heal peptic ulcers has all but eliminated surgery as a treatment option for peptic ulcer disease. Older clients, however, may have undergone gastric resection surgery for PUD, and may have long-term complications related to the surgery. See the section on gastric cancer for more information about gastric surgery and its potential complications.

Treatment of Complications

The client hospitalized with a complication of PUD such as bleeding, gastrointestinal obstruction, or perforation and peritonitis requires additional interventions to restore homeostasis.

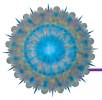
In hemorrhage associated with PUD, initial interventions focus on restoring and maintaining circulation. Normal saline, lactated Ringer's, or other balanced electrolyte solutions are administered intravenously to restore intravascular volume if signs of shock (tachycardia, hypotension, pallor, low urine output, and anxiety) are present. Whole blood or packed red blood cells may be administered to restore hemoglobin and hematocrit levels. A nasogastric tube is inserted to prevent aspiration of vomited gastric contents.

Gastroscopy with direct injection of a clotting or sclerosing agent into the bleeding vessel may be performed. Laser photocoagulation, using light energy, or electrocoagulation, which uses electric current to generate heat, can also be done via gastroscopy to seal bleeding vessels.

The client is kept NPO until bleeding is controlled. Proton-pump inhibitors are administered intravenously (e.g., 40 mg of pantoprazole [Protonix] per intravenous push or admixture daily) to reduce the risk of rebleeding. Surgery may be necessary if medical measures are ineffective in controlling bleeding. Older adults who experience bleeding as a complication of PUD are more likely to rebleed or require surgery to control the hemorrhage. See page 690 for nursing care of the client having gastric surgery.

Repeated inflammation, healing, scarring, edema, and muscle spasm can lead to gastric outlet (pyloric) obstruction. Initial treatment includes gastric decompression with nasogastric suction and administration of intravenous normal saline and potassium chloride to correct fluid and electrolyte imbalance. H_2-receptor blockers are given intravenously as well. Balloon dilation of the gastric outlet may be done via upper endoscopy. If these measures are unsuccessful in relieving obstruction, surgery may be required.

Gastric or duodenal perforation resulting in contamination of the peritoneum with gastrointestinal contents often requires immediate intervention to restore homeostasis and minimize peritonitis. Intravenous fluids maintain fluid and electrolyte balance. Nasogastric suction removes gastric contents and minimizes peritoneal contamination. Placing the client in Fowler's or semi-Fowler's position allows peritoneal contaminants to pool in the pelvis. Intravenous antibiotics aggressively treat bacterial infection from intestinal flora. Laparoscopic surgery or an open laparotomy may close the perforation.



NURSING CARE

Health Promotion

Although it is difficult to predict which clients will develop peptic ulcer disease, promote health by advising clients to avoid risk factors such as excessive aspirin or NSAID use and cigarette smoking. In addition, encourage clients to seek treatment for manifestations of GERD or chronic gastritis, both of which also are associated with *H. pylori* infection.

Assessment

Collect the following subjective and objective data when assessing the client with peptic ulcer disease:

- *Health history:* Complaints of epigastric or left upper quadrant pain, heartburn, or discomfort; its character, severity, timing and relationship to eating; measures used for relief; nausea or vomiting, presence of bright blood or "coffee-grounds" appearing material in vomitus; current medications including use of aspirin or other NSAIDs; cigarette smoking and use of alcohol or other drugs.
- *Physical examination:* General appearance including height and weight relationship; vital signs including orthostatic measurements; abdominal examination including shape and contour, bowel sounds, and tenderness to palpation; presence of obvious or occult blood in vomitus and stool.

Nursing Diagnoses and Interventions

The priorities of nursing care for the client with peptic ulcer disease are reducing discomfort, maintaining nutritional status, and preventing or rapidly identifying and intervening for potential complications. See the accompanying Nursing Care Plan below.

Pain

The pain of peptic ulcer disease is often predictable and preventable. Pain is typically experienced 2 to 4 hours after eating, as high levels of gastric acid and pepsin irritate the exposed mucosa. Measures to neutralize the acid, minimize its production, or protect the mucosa often relieve this pain, minimizing the need for analgesics.

- Assess pain, including location, type, severity, frequency, and duration, and its relationship to food intake or other contributing factors.

PRACTICE ALERT

Avoid making assumptions about pain. Acute pain may indicate a complication, such as perforation (often heralded by sudden, severe epigastric pain and a rigid, boardlike abdomen) or it may be totally unrelated to PUD (e.g., angina, gallbladder disease, or pancreatitis).

- Administer PPIs, H_2-receptor antagonists, antacids, or mucosal protective agents as ordered. Monitor for effectiveness and side effects or adverse reactions. *The pain associated with*

NURSING CARE PLAN A Client with Peptic Ulcer Disease

Sean O'Donnell is a 47-year-old police officer who lives and works in a metropolitan area. Mr. O'Donnell has had "heartburn" and abdominal discomfort for years, but thought it went along with his job. Last year, after becoming weak, light-headed, and short of breath, he was found to be anemic and was diagnosed as having a duodenal ulcer. He took omeprazole (Prilosec) and ferrous sulfate for 3 months before stopping both, saying he had "never felt better in his life." Mr. O'Donnell has now been admitted to the hospital with active upper GI bleeding.

ASSESSMENT

Rachel Clark is Mr. O'Donnell's admitting nurse and case manager. On initial assessment, Mr. O'Donnell is alert and oriented, though very apprehensive about his condition. Skin pale and cool; BP 136/78, P 98; abdomen distended and tender with hyperactive bowel sounds; 200 mL bright red blood obtained on nasogastric tube insertion. Hemoglobin 8.2 g/dL and hematocrit 23% on admission. Mr. O'Donnell is taken to the endoscopy lab where his bleeding is controlled using laser photocoagulation. On his return to the nursing unit, he receives two units of packed RBCs and intravenous fluids to restore blood volume. A 5-day course of high-dose oral omeprazole (40 mg bid) is ordered to prevent rebleeding, and Mr. O'Donnell is allowed to begin a clear liquid diet 24 hours after his endoscopy. Tissue biopsy obtained during endoscopy confirms the presence of *H. pylori* infection.

DIAGNOSES

- *Deficient Fluid Volume* related to acutely bleeding duodenal ulcer
- *Risk for Injury* related to acute blood loss
- *Fear* related to threat to well-being
- *Ineffective Therapeutic Regimen Management* related to lack of knowledge regarding PUD and its treatment

EXPECTED OUTCOMES

- Maintains normal blood pressure, pulse, and urine output (>30 mL/h).
- Remains free of injury.
- Seeks information to reduce fear.
- Identifies and uses coping strategies to manage fear.
- Describes prescribed therapeutic regimen.
- Verbalizes ability to manage prescribed regimen.

PLANNING AND IMPLEMENTATION

- Place call light within reach and encourage to ask for help when getting up or ambulating. Remind to rise slowly from lying to sitting and sitting to standing.
- Discuss situation and provide information about all procedures and treatments.
- Reassure about the effectiveness of treatment in reducing the risk for further bleeding.
- Discuss current and planned treatment measures; stress the importance of completing the prescribed treatment to reduce the risk of further ulcer development.
- Encourage to avoid using aspirin or NSAIDs in the future; suggest alternative medications such as acetaminophen.
- Discuss stress reduction techniques and refer for stress reduction counseling or workshops as indicated.

EVALUATION

Mr. O'Donnell is discharged 48 hours after admission. He has had no further evidence of bleeding, and has resumed a regular diet. His hemoglobin and hematocrit remain low, and he has a prescription for ferrous sulfate. He will complete the prescribed high-dose omeprazole regimen at home, then begin treatment with omeprazole, amoxicillin, and clarithromycin (Biaxin) to eradicate the *H. pylori* infection detected during endoscopy. After 2 weeks of this regimen, he will continue taking omeprazole at bedtime for 4 to 8 weeks. He verbalizes a good understanding of his treatment and the importance of completing the entire regimen. Mr. O'Donnell expresses concern about his ability to "keep his cool on the inside" when under stress. Ms. Clark, his case manager, gives him the names of several resources to help with stress management in case he wants help.

CRITICAL THINKING IN THE NURSING PROCESS

1. How does *H. pylori* infection contribute to the development of peptic ulcers?
2. Describe the physiologic responses to fear and anxiety. Why is it important to alleviate fear and its physical consequences in clients with PUD?
3. What suggestions can you make to help Mr. O'Donnell manage his complex treatment regimen during the next 3 months?
4. Develop a teaching plan that includes stress reduction techniques Mr. O'Donnell can use while performing his duties as a police officer.

See Evaluating Your Response in Appendix C.

MEDIALINK Care Plan Activity: Peptic Ulcer Disease

PUD is generally caused by the effect of gastric juices on exposed mucosal tissue. These medications reduce pain and promote healing by reducing acid production, neutralizing acid, or providing a barrier for the damaged mucosa.

- Teach relaxation, stress reduction, and lifestyle management techniques. Refer for stress management counseling or classes as indicated. *Although there is no clear relationship between stress and PUD, measures to relieve stress and promote physical and emotional rest help reduce the perception of pain and may reduce ulcer genesis.*

Disturbed Sleep Pattern

Nighttime ulcer pain, which typically occurs between 1:00 and 3:00 A.M., may disrupt the sleep cycle and result in inadequate rest. Anticipation of pain may lead to insomnia or other sleep disruptions.

- Stress the importance of taking medications as prescribed. *The bedtime dose of PPI or H_2-receptor blocker minimizes hydrochloric acid production during the night, reducing nighttime pain.*
- Instruct to limit food intake after the evening meal, eliminating any bedtime snack. *Eating before bed can stimulate the production of gastric acid and pepsin, increasing the likelihood of nighttime pain.*
- Encourage use of relaxation techniques and comfort measures such as soft music as needed to promote sleep. *Once the pain associated with PUD has been controlled, these measures help reduce anxiety and reestablish a normal sleep pattern.*

Imbalanced Nutrition: Less than Body Requirements

In an attempt to avoid discomfort, the client with peptic ulcer disease may gradually reduce food intake, sometimes jeopardizing nutritional status. Anorexia and early satiety are additional problems associated with PUD.

- Assess current diet, including pattern of food intake, eating schedule, and foods that precipitate pain or are being avoided in anticipation of pain. *The client may not realize the extent of self-imposed dietary limitations, especially if symptoms have persisted for an extended time. Assessment increases awareness and also helps identify the adequacy of nutrient intake.*
- Refer to a dietitian for meal planning to minimize PUD symptoms and meet nutritional needs. Consider normal eating patterns and preferences in meal planning. *Although no specific diet is recommended for PUD, clients should avoid foods that increase pain. Six small meals per day often help increase food tolerance and decrease postprandial discomfort.*
- Monitor for complaints of anorexia, fullness, nausea, and vomiting. Adjust dietary intake or medication schedule as indicated. *PUD and resultant scarring can lead to impaired gastric emptying, necessitating a treatment change.*

PRACTICE ALERT

Advise the client to report increasing or persistent symptoms of anorexia, nausea and vomiting, or fullness to the healthcare provider.

- Monitor laboratory values for indications of anemia or other nutritional deficits. Monitor for therapeutic and side effects of treatment measures such as oral iron replacement. Instruct the client taking oral iron replacement to avoid using an antacid within 1 to 2 hours of taking the iron preparation. *Anemia can result from poor nutrient absorption or chronic blood loss in clients with PUD. Oral iron supplements may cause GI distress, nausea, and vomiting; if these side effects are intolerable, notify the physician for a possible change of therapy. Antacids bind with oral iron preparations, blocking absorption.*

Deficient Fluid Volume

Erosion of a blood vessel with resultant hemorrhage is a significant risk for the client with peptic ulcer disease. Acute bleeding can lead to hypovolemia and fluid volume deficit, which can lead to a decrease in cardiac output and impaired tissue perfusion.

PRACTICE ALERT

Monitor and record blood pressure and apical pulse every 15 to 30 minutes until stable; monitor central venous pressure or pulmonary artery pressure as indicated. Insert a Foley catheter and monitor urinary output hourly. Weigh daily. Continuous monitoring of cardiac output parameters is essential in clients with an acute hemorrhage to identify possible shock and intervene at an early stage.

- Monitor stools and gastric drainage for overt and occult blood. Assess gastric drainage (vomitus or from a nasogastric tube) to estimate the amount and rapidity of hemorrhage. *Drainage is bright red with possible clots in acute hemorrhage; dark red or the color of coffee grounds when blood has been in the stomach for a period of time. Hematochezia (stool containing red blood and clots) is present in acute hemorrhage; melena (black, tarry stool) is an indicator of less acute bleeding. When small vessels are disrupted, bleeding may be slow and not overtly evident. With chronic or slow gastrointestinal bleeding, the risk of a fluid volume deficit is minimal; anemia and activity intolerance are more likely.*
- Maintain intravenous therapy with fluid volume and electrolyte replacement solutions; administer whole blood or packed cells as ordered. *Both fluids and electrolytes are lost through vomiting, nasogastric drainage, and diarrhea in an episode of acute bleeding. To prevent shock, it is essential to maintain a blood volume and cardiac output sufficient to perfuse body tissues. Whole blood and packed cells replace both blood volume and red blood cells, providing additional oxygen-carrying capacity to meet cell needs.*
- Insert a nasogastric tube and maintain its position and patency. Initially, measure and record gastric output every hour, then every 4 to 8 hours. *Nasogastric suction removes blood from the gastrointestinal tract, preventing vomiting and possible aspiration. Gastric output is replaced milliliter for milliliter with a balanced electrolyte solution to maintain homeostasis.*
- Monitor hemoglobin and hematocrit, serum electrolytes, BUN, and creatinine values. Report abnormal findings. *Hemoglobin and hematocrit are lower than normal with acute or chronic GI bleeding. In acute hemorrhage, initial results may be within*

normal range because both cells and plasma are lost. Loss of fluids and electrolytes with gastric drainage and diarrhea will alter normal levels. Digestion and absorption of blood in the GI tract may result in elevated BUN and creatinine levels.

- Assess abdomen, including bowel sounds, distention, girth, and tenderness every 4 hours and record findings. *Borborygmi or hyperactive bowel sounds with abdominal tenderness are common with acute GI bleeding. Increased distention, increasing abdominal girth, absent bowel sounds, or extreme tenderness with a rigid, boardlike abdomen may indicate perforation.*
- Maintain bed rest with the head of the bed elevated. Ensure safety. *Loss of blood volume may cause orthostatic hypotension with resultant syncope or dizziness upon standing.*

Using NANDA, NIC, and NOC

Chart 23–3 shows links between NANDA nursing diagnoses, NIC, and NOC when caring for a client with peptic ulcer disease.

Community-Based Care

Peptic ulcer disease is managed in home and community-based settings; only its complications typically require treatment in an acute care setting. Provide the following information when preparing the client for home care:

- Prescribed medication regimen, including desired and potential adverse effects
- Importance of continuing therapy even when symptoms are relieved
- Relationship between peptic ulcers and factors such as NSAID use and smoking. If indicated, refer to a smoking cessation clinic or program.
- Importance of avoiding aspirin and other NSAIDs; stress the necessity of reading the labels of over-the-counter medications for possible aspirin content
- Manifestations of complications that should be reported to the care provider, including increased abdominal pain or distention, vomiting, black or tarry stools, light-headedness, or fainting
- Stress and lifestyle management techniques that may help prevent exacerbation. Refer to resources for stress management, such as classes, counseling, and formal or informal groups.

NANDA, NIC, AND NOC LINKAGES

CHART 23–3 The Client with Peptic Ulcer Disease

NANDA

Ineffective Health Maintenance

↓

NIC

Medication Management

Nausea Management

Fluid/Electrolyte Management

Teaching: Disease Process

↓

NOC

Comfort Level

Nutritional Status: Food and Fluid Intake

Hydration

Knowledge Status: Treatment Regimen

Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Mass (2004), St. Louis, MO: Mosby.

THE CLIENT WITH CANCER OF THE STOMACH

Worldwide, cancer of the stomach is the most common cancer (after skin cancer), but it is less common in the United States.

FAST FACTS

- An estimated 21,800 new cases of stomach cancer are diagnosed annually in the United States (ACS, 2005).
- Its incidence is highest in Hispanics, African Americans, and Asian Americans.
- Men are affected twice as often as women.

Older adults are more likely to develop gastric cancer: The mean age at time of diagnosis is 63. People in lower socioeconomic groups are more often affected by gastric cancer.

Risk Factors

H. pylori infection is a major risk factor for cancer of the distal portion of the stomach; from 35% to 89% of cases can be attributed to this infection. Other risk factors are a genetic predisposition, chronic gastritis, pernicious anemia, gastric polyps, and carcinogenic factors in the diet (such as smoked foods and nitrates). Achlorhydria, a lack of hydrochloric acid in the stomach, is a known risk factor. The risk for gastric cancer also is increased in people who have had a partial gastric resection.

Pathophysiology

Adenocarcinoma, which involves the mucous-producing cells of the stomach, is the most common form of gastric cancer. These carcinomas may arise anywhere on the mucosal surface of the stomach but are most frequently found in the distal portion. Half of all gastric cancers occur in the antrum or pyloric region (Porth, 2005). Gastric cancer begins as a localized lesion (*in situ*), then progresses to involve the mucosa or submucosa (early gastric carcinoma). Lesions may spread by direct extension to tissues surrounding the stomach, the liver in particular. The lesion may ulcerate or appear as a polypoid (polyp-like) mass (Figure 23–10 ■). Lymph node involvement and metastasis occur early due to the rich blood and lymphatic supply to the stomach. Metastatic lesions are often found in the liver, lungs, ovaries, and peritoneum.

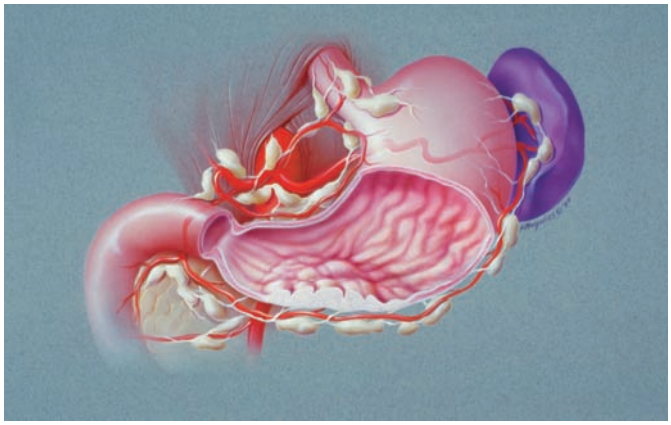


Figure 23–10 ■ The spread and forms (polypoid and ulcerating) of gastric cancer.

Source: Robert Margulies/Phototake NYC.

Manifestations

Few symptoms are associated with gastric cancer. Unfortunately, the disease is often quite advanced and metastases are usually present at the time of diagnosis. Early symptoms are vague, including feelings of early satiety, anorexia, indigestion, and possibly vomiting. The client may experience ulcer-like pain unrelieved by antacids, typically occurring after meals. As the disease progresses, weight loss occurs, and the client may be **cachectic** (in very poor health and malnourished) at the time of diagnosis. An abdominal mass may be palpable, and occult blood may be present in the stool, indicating gastrointestinal bleeding.

INTERDISCIPLINARY CARE

Diagnosis

Anemia detected by a CBC often is the first indication of gastric cancer. An upper GI x-ray with barium swallow is useful to identify lesions, and ultrasound or other radiologic techniques may identify a mass. Upper endoscopy with visualization and biopsy of the lesion provides the definitive diagnosis.

Surgery

When gastric cancer is identified prior to the development of metastasis, surgical removal of part or all of the stomach and regional lymph nodes is the treatment of choice. **Partial gastrectomy** involves removal of a portion of the stomach, usually the distal half to two-thirds. In partial gastrectomy, the surgeon constructs an anastomosis from the remainder of the stomach directly to the duodenum or to the proximal jejunum. The **gastroduodenostomy**, or **Billroth I**, and the **gastrojejunostomy**, or **Billroth II**, are commonly used partial gastrectomy procedures (Figures 23–11A ■ and B).

A **total gastrectomy**, removal of the entire stomach, may be done for diffuse cancer that is spread throughout the gastric mucosa but limited to the stomach. In a total gastrectomy, the surgeon constructs an anastomosis from the esophagus to the duodenum or jejunum. Total gastrectomy with **esophagojejunostomy** is illustrated in Figure 23–11C.

Nursing care of the client who has undergone gastric surgery is outlined in the box on the following page.

Complications

Several long-term complications may develop following gastrectomy procedures. **Dumping syndrome** is the most common problem. It may follow a partial gastrectomy with duodenal or jejunal anastomosis. When the pylorus has been resected or bypassed, a hypertonic, undigested food bolus may rapidly enter the duodenum or jejunum. Water is pulled into the lumen of the intestine by the hyperosmolar character of the chyme, resulting

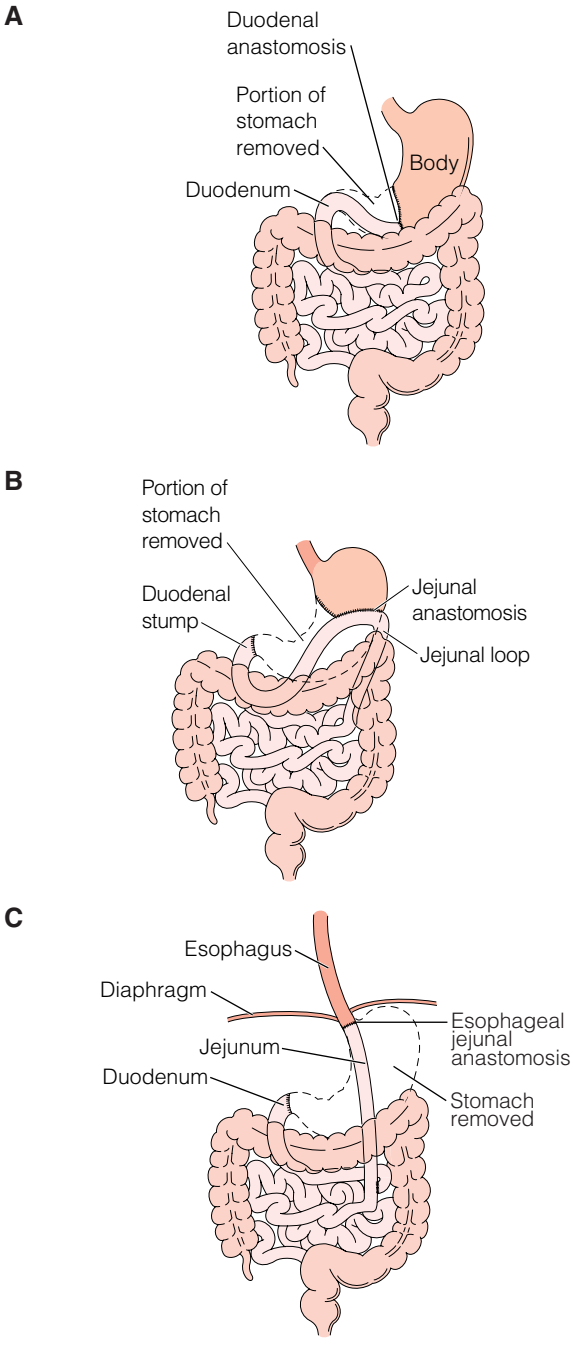


Figure 23–11 ■ Partial and total gastrectomy procedures. *A,* Partial gastrectomy with anastomosis to the duodenum. *B,* Partial gastrectomy with anastomosis to the jejunum. *C,* Total gastrectomy with anastomosis of the esophagus to the jejunum.

NURSING CARE OF THE CLIENT HAVING Gastric Surgery

PREOPERATIVE NURSING CARE

- See Chapter 4 ∞ for routine preoperative care and teaching.
- Insert a nasogastric tube if ordered preoperatively. *Although it is often inserted in the surgical suite just prior to surgery, the nasogastric tube may be placed preoperatively to remove secretions and empty stomach contents.*

POSTOPERATIVE NURSING CARE

- Provide routine care for the surgical client as outlined in Chapter 4 ∞.
- Assess position and patency of nasogastric tube, connecting it to low suction. Gently irrigate with sterile normal saline if tube becomes clogged. *The nasogastric tube will be placed in surgery to avoid disruption of the gastric suture lines and should be well secured. If repositioning or tube replacement is needed, notify the surgeon. Patency must be maintained to keep the stomach decompressed, reducing pressure on sutures.*
- Assess color, amount, and odor of gastric drainage, noting any changes in these parameters or the presence of clots or bright bleeding. *Initial drainage is bright red. It becomes dark, then clear or greenish-yellow over the first 2 to 3 days. A change in the color, amount, or odor may indicate a complication such as hemorrhage, intestinal obstruction, or infection.*
- Maintain intravenous fluids while nasogastric suction is in place. *The client on nasogastric suction is not only unable to take oral food and fluids but also is losing electrolyte-rich fluid through the nasogastric tube. If replacement fluid and electrolytes are not maintained, the client is at risk for dehydration, imbalances of sodium, potassium, and chloride; and metabolic alkalosis.*
- Provide antiulcer and antibiotic therapy as ordered. *These medications may be ordered for the postoperative client, depending on the procedure performed. Antibiotic therapy is a common preventive measure for infection that may result from contamination of the abdominal cavity with gastric contents.*
- Monitor bowel sounds and abdominal distention. *Bowel sounds indicate resumption of peristalsis. Increasing distention may indicate third spacing, obstruction or infection.*
- Resume oral food and fluids as ordered. Initial feedings are clear liquids, progressing to full liquids and then frequent small feedings of regular foods. Monitor bowel sounds and for abdominal distention frequently during this period. *Oral feedings are reintroduced slowly to minimize trauma to the suture lines by possible gastric distension.*
- Encourage ambulation. *Ambulation stimulates peristalsis.*
- Begin discharge planning and teaching. Consult with a dietitian for diet instructions and menu planning; reinforce teaching. Teach the client about potential postoperative complications, such as abdominal abscess, dumping syndrome, postprandial hypoglycemia, or pernicious anemia. Also, teach the client to recognize signs and symptoms and preventive measures. *The client's gastric capacity is reduced after partial gastrectomy, necessitating a corresponding reduction in meal size. Changes in gastric emptying and reduction in gastric secretions may change the client's tolerance for many foods, requiring slow reintroduction of these foods. Dumping syndrome, postprandial hypoglycemia, and pernicious anemia are possible long-term complications of partial gastrectomy. For most clients, dietary modifications can control both dumping syndrome and postprandial hypoglycemia.*

in decreased blood volume and intestinal dilation. Peristalsis is stimulated, and intestinal motility is increased.

Early symptoms of dumping syndrome occur within 5 to 30 minutes after eating. These symptoms result from intestinal dilation, peristaltic stimulation, and hypovolemia caused by undigested food in the proximal small intestine. Manifestations include nausea with possible vomiting, epigastric pain with cramping and borborygmi (loud, hyperactive bowel sounds), and diarrhea. Systemic symptoms from the hypovolemia and reflex sympathetic stimulation include tachycardia, orthostatic hypotension, dizziness, flushing, and diaphoresis.

The entry of hyperosmolar chyme into the jejunum also causes a rapid rise in the blood glucose. This stimulates the release of an excessive amount of insulin, leading to hypoglycemic symptoms 2 to 3 hours after the meal. The pathogenesis and clinical manifestations of dumping syndrome are represented in Figure 23–12 ■. Dumping syndrome is typically self-limiting, lasting 6 to 12 months after surgery; however, a small percentage of people continue to experience long-term symptoms.

Dumping syndrome is managed primarily by a dietary pattern that delays gastric emptying and allows smaller boluses of undigested food to enter the intestine. Meals should be small and more frequent. Liquids and solids are taken at separate times instead of together during a meal. The amount of

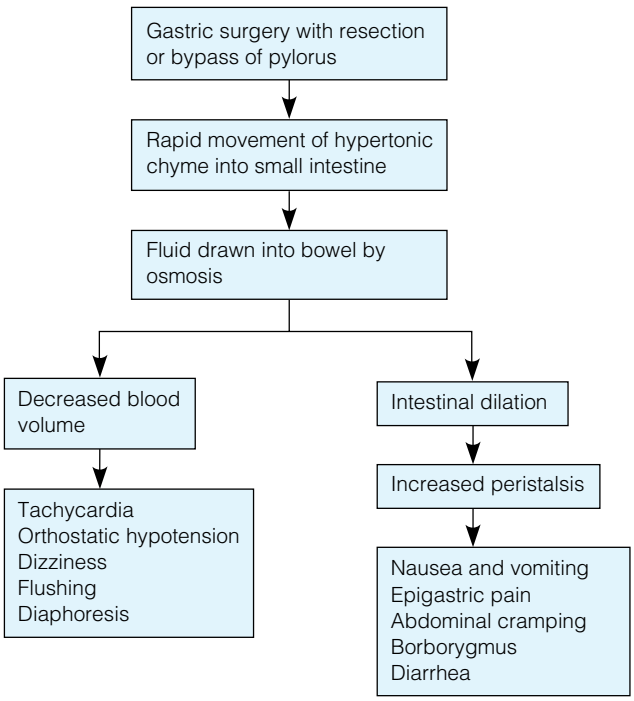


Figure 23–12 ■ The pathogenesis and manifestations of dumping syndrome.

proteins and fats in the diet is increased, because they exit the stomach more slowly than carbohydrates. Carbohydrates, especially simple sugars, are reduced. The client is instructed to rest in a recumbent or semirecumbent position for 30 to 60 minutes after meals. Anticholinergics, sedatives, and antispasmodics may be prescribed.

Anemia may be a chronic problem after a major gastric resection. Iron is absorbed primarily in the duodenum and proximal jejunum; rapid gastric emptying or a gastrojejunostomy may interfere with adequate absorption.

The cells of the stomach produce intrinsic factor, required for the absorption of vitamin B_{12}. Vitamin B_{12} deficiency leads to pernicious anemia. Because of hepatic stores of vitamin B_{12}, symptoms of anemia may not be seen for 1 to 2 years after surgery. Vitamin B_{12} levels are routinely monitored following extensive gastric resections.

Other nutritional problems seen following surgery include folic acid deficiency and decreased absorption of calcium and vitamin D. Poor absorption of nutrients, combined with the inability to eat large meals, puts the client at risk for weight loss in addition to the more specific nutrient deficiencies. Nearly 50% of clients who have gastric surgery experience significant weight loss, primarily because of insufficient calorie intake. Factors contributing to insufficient intake of calories include early satiety (feeling of fullness), decreased stomach size, and altered emptying patterns.

Other Therapies

Radiation or chemotherapy may be used to eliminate any lymphatic or metastatic spread. For the client with more advanced disease, treatment is palliative and may include surgery and chemotherapy. These clients may require a gastrostomy or jejunostomy feeding tube (Figure 23–13 ■). See the box on page 692 for nursing care of the client with a gastrostomy or jejunostomy tube.

Because gastric cancer is generally advanced by the time of diagnosis, the prognosis is poor. The 5-year survival rate of all clients treated for gastric carcinoma is 10%.

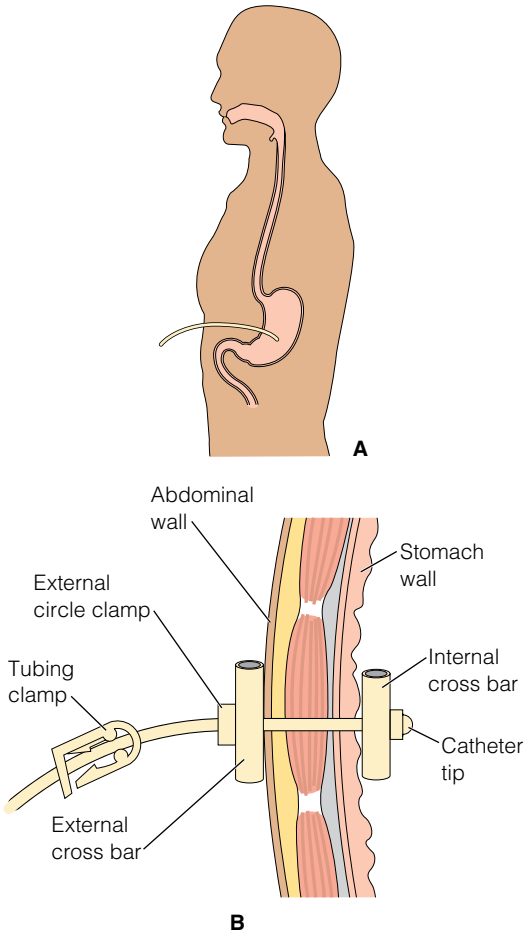


Figure 23–13 ■ Gastrostomy. *A,* Gastrostomy tube placement. *B,* The tube is fixed against both the abdomen and stomach walls by cross bars.

NURSING CARE

Health Promotion

Although the exact causes of gastric cancer are unknown, contributing factors such as *H. pylori* infection and consumption of foods preserved with nitrates have been identified. To reduce their risk of developing gastric cancer, encourage clients with known *H. pylori* infection to complete the prescribed course of treatment and verify that it has eradicated the infection. With all clients, discuss the relationship between gastric cancer and consumption of foods preserved with nitrates (such as bacon and other processed meats), and encourage limited consumption of these products.

Assessment

Assessment data related to gastric cancer include the following:

- *Health history:* Manifestations such as anorexia, early satiety, indigestion, or vomiting; epigastric pain after meals; recent unintentional weight loss.
- *Physical assessment:* General appearance, weight for height; abdominal distention or a palpable upper abdominal mass; occult blood in stool or vomitus.

Nursing Diagnoses and Interventions

Priorities of nursing care for the client with gastric cancer focus on effects of the disease and its treatment on nutritional status, and on the effects of a potentially fatal disease on the client and family. See the accompanying Nursing Care Plan on pages 692–693.

Imbalanced Nutrition: Less than Body Requirements

The client with gastric cancer may be malnourished because of anorexia, early satiety, and increased metabolic needs related to the tumor. Extensive gastric resection also makes it difficult to consume an adequate diet. Malnourishment, in turn, impairs healing and the client's ability to tolerate cancer treatment.

NURSING CARE OF THE CLIENT WITH A **Gastrostomy or Jejunostomy Tube**

Clients who have had extensive gastric surgery or who require long-term enteral feedings to maintain nutrition may have a gastrostomy or jejunostomy tube inserted.

PROCEDURE

Gastrostomy tubes are surgically placed in the stomach, with the stoma in the epigastric region of the abdomen (see Figure 23–13). Jejunostomy tubes are placed in the proximal jejunum. Immediately following the procedure, the tube may be connected to low suction or plugged. If the client has been receiving tube feedings, these may be reinitiated shortly after tube placement.

NURSING CARE

- Assess tube placement by aspirating stomach contents and checking the pH of aspirate to determine gastric or intestinal placement. A pH of 5 or less indicates gastric placement; the pH is generally 7 or higher with intestinal placement. *Recent studies show auscultation to be ineffective in determining feeding tube placement. Measuring the pH of aspirate from the tube is more reliable as a means of determining tube placement.*
- Inspect the skin surrounding the insertion site for healing, redness, swelling, and the presence of any drainage. If drainage is present, note the color, amount, consistency, and odor. *Changes in the insertion site, drainage, or lack of healing may indicate an infection.*
- Assess the abdomen for distention, bowel sounds, and tenderness *to evaluate functioning of the gastrointestinal tract.*
- Until the stoma is well healed, use sterile technique for dressing changes and site care. Clean technique is appropriate for use once healing is complete. *Sterile technique reduces the risk of wound contamination by pathogens that can lead to infection. Once healing has occurred, clean technique is acceptable because the gastrointestinal tract is not a sterile body cavity.*
- Wearing clean gloves, remove old dressing. Cleanse the site with saline or soap and water, and rinse as appropriate. A well-healed stoma may be cleansed in the shower with the tube clamped or plugged. Pat dry with 4 × 4 gauze pads, and allow to air dry. Apply Stomahesive, karaya, or other protective agents around tube as needed to protect the skin. *Gastric acid and other wound drainage is irritating to the skin. Meticulous care is important to maintain the integrity of the skin surrounding the stoma.*
- Redress the wound using a stoma dressing or folded 4 × 4 gauze pads. *Do not cut gauze pads, because threads may enter the wound, causing irritation and increasing the risk of inflammation.*
- Irrigate the tube with 30 to 50 mL of water, and clean the tube inside and out as indicated or ordered. Soft gastric tubes may require cleaning of the inner lumen with a special brush to maintain patency. *Tube feeding formulas may coat the inside of the gastrostomy tube and eventually cause it to become occluded. Regular irrigation with water and brushing as indicated maintain tube patency.*
- Provide mouth care or remind the client to do so. *When feedings are not being taken orally, the usual stimulus to do mouth care is lost. In addition, salivary fluids may not be as abundant, and oral mucous membranes may become dry and cracked.*
- If indicated, teach the client and family how to care for the tube and feedings. Refer to a home health agency or visiting nurse for support and reinforcement of learning. *Gastrostomy tubes are often in place long term. When the client and family are able to assume care, independence and self-image are enhanced.*

NURSING CARE PLAN **A Client with Gastric Cancer**

George Harvey is a 61-year-old estate attorney who lives with his wife, Harriet. For the last 3 months, Mr. Harvey has had increasing anorexia and difficulty eating. He has lost 10 pounds. His physician has diagnosed gastric cancer, and Mr. Harvey is admitted for a partial gastrectomy and gastrojejunostomy. The oncologist has recommended postoperative chemotherapy and radiation. Mr. Harvey reports that the doctor told him "that will give me the best chance for cure."

ASSESSMENT

On admission before surgery, Mr. Harvey tells his nurse, Lauren Walsh, that he has eaten very little in the past few weeks. He asks, "What will happen to my wife if something happens to me? I'm afraid this cancer will get me." Mr. Harvey weighs 147 lb (67 kg) and is 72 inches (183 cm) tall. He is pale and thin; his vital signs are BP 148/86, P 92, R 18, and T 97.8°F PO. A firm mass is palpable in the left epigastric region. The rest of his physical assessment data are within normal limits. Mr. Harvey's hemoglobin is 12.8 g/dL, hematocrit is 39%, and serum albumin level is 3.2 g/dL, indicating that he is mildly malnourished. All other preoperative laboratory and diagnostic studies are within normal limits.

DIAGNOSES

- *Imbalanced Nutrition: Less than Body Requirements* related to anorexia and difficulty eating
- *Acute Pain* related to surgical incision and manipulation of abdominal organs
- *Risk for Ineffective Airway Clearance* related to upper abdominal surgery
- *Anticipatory Grieving* related to recent diagnosis of cancer

EXPECTED OUTCOMES

- Maintain present weight during hospitalization.
- Resume a high-calorie, high-protein diet by time of discharge.
- Verbalize effective pain management, maintaining a reported pain level of 3 or less on a scale of 1 to 10.
- Maintain a patent airway and clear breath sounds.
- Verbalize feelings regarding diagnosis and participate in decision making.

PLANNING AND IMPLEMENTATION

- Weigh daily.
- Maintain nasogastric tube placement, patency, and suction as ordered.
- Maintain intravenous fluids and total parenteral nutrition as ordered until oral food intake is resumed.
- Arrange for diet teaching, including strategies to prevent dumping syndrome, before discharge.
- Maintain patient-controlled analgesia until able to take oral analgesics.

(continued)

NURSING CARE PLAN **A Client with Gastric Cancer (continued)**

- Assess respiratory status including rate, depth, and breath sounds every hour initially, then every 4 hours.
- Assist to cough, deep breathe, and use inspirometer every 2 to 4 hours and as needed. Splint abdomen during coughing.
- Encourage verbalization of feelings about diagnosis and perceived losses.
- Encourage participation in decision making.

EVALUATION

Mr. Harvey's weight remained stable through his hospitalization. On discharge he is taking a high-protein, high-calorie diet in six small feedings per day. He and his wife have reviewed his diet with the dietitian and are planning on using some dietary supplements at home to meet protein needs. He verbalizes an understanding of measures to prevent dumping syndrome, including separating his intake of solid foods and liquids. Mr. Harvey is using oral analgesics in the morning and at bedtime to control his pain. He and his wife have begun to discuss the meaning of his diagnosis. Mrs. Harvey tells the discharge nurse, "We are going to go to a support group called 'Coping with Cancer' when George is stronger."

CRITICAL THINKING IN THE NURSING PROCESS

1. What is the rationale for maintaining nasogastric suction after gastrojejunostomy?
2. Develop a preoperative teaching plan for a client undergoing a partial gastrectomy.
3. Mr. Harvey calls you just before the initial dose of chemotherapy and says, "Everyone tells me that chemotherapy will cause vomiting, and I don't think I can take being sick again." How would you respond?
4. Design interventions to ensure adequate nutrition for people with advanced gastric cancer.

See Evaluating Your Response in Appendix C.

- Consult with dietitian for a complete nutrition assessment and diet planning. *The client is at risk for protein-calorie malnutrition, which impairs the ability to heal and recover from extensive surgery.*
- Weigh daily. Monitor laboratory values such as hemoglobin, hematocrit, and serum albumin levels. *Daily weights are a valuable measurement of both fluid and nutritional status. Laboratory values provide further evidence of nutritional status.*
- Provide preferred foods; have family prepare meals when possible. Provide supplemental feedings between meals. *Small, frequent feedings and preferred foods encourage intake of nutrients.*

PRACTICE ALERT

Assess ability to consume adequate nutrients. Nausea and feelings of early satiety may impair nutrient consumption, indicating a need to institute enteral or parenteral feedings.

- Arrange for visitors to be present during meals. *Eating is a social function as well as a physiologic one. Companionship often improves food intake.*
- Administer pain and antiemetic medications as needed before meals. *Pain and nausea suppress the appetite; relief promotes food intake.*

Anticipatory Grieving

- Encourage family members to spend as much time as possible with the client. *The family may feel helpless and ineffectual. Supporting family members' presence can encourage this vital interaction.*
- Do not negate denial if present. *Denial is a coping mechanism that protects the client from hopelessness.*
- Allow clients to talk openly if desired about their condition and the prognosis. *Acceptance of the clients' fears helps reduce anxiety and promote coping behaviors.*
- Actively listen to the client's and family's expressions of grieving. Avoid interrupting or offering meaningless words of consolation. *Being present and listening actively are often the most effective interventions for the grieving client.*

Using NANDA, NIC, and NOC

Chart 23–4 shows links between NANDA nursing diagnoses, NIC, and NOC when caring for a client with gastric cancer.

NANDA, NIC, AND NOC LINKAGES
CHART 23–4 **The Client with Gastric Cancer**

NANDA

Imbalanced Nutrition: Less than Body Requirements

↓

NIC

Diet Staging

Nutrition Management

Weight Gain Assistance

↓

NOC

Nutritional Status: Nutrient Intake

Weight Control

Data from *NANDA's Nursing Diagnoses: Definitions & Classification 2005–2006* by NANDA International (2005), Philadelphia; *Nursing Interventions Classification (NIC)* (4th ed.) by J. M. Dochterman & G. M. Bulechek (2004), St. Louis, MO: Mosby; and *Nursing Outcomes Classification (NOC)* (3rd ed.) by S. Moorhead, M. Johnson, and M. Mass (2004), St. Louis, MO: Mosby.

Community-Based Care

Although the client with gastric cancer may be hospitalized for surgery, most care is provided in the home and community-based settings such as hospice care. When preparing the client and family for home care, discuss the following topics:

- Care of incision and feeding tube (if present) or central venous line
- Maintaining nutrition and preventing complications of surgery such as dumping syndrome
- Pain management
- Provide referrals to home care agencies, hospice, and cancer support groups as appropriate.
- Provide information about services available through the local chapter of the American Cancer Society.

EXPLORE MEDIALINK

Prentice Hall Nursing MediaLink DVD-ROM

Audio Glossary
NCLEX-RN® Review

Animation
Ranitidine

COMPANION WEBSITE www.prenhall.com/lemone

Audio Glossary
NCLEX-RN® Review
Care Plan Activity: Peptic Ulcer Disease and Pain
Case Studies
GERD
Peptic Ulcer Disease
MediaLink Applications
Oral Cancer
Reflux Dyspareunia
Links to Resources

CHAPTER HIGHLIGHTS

- Nausea and vomiting, common GI symptoms, may be indicative of disorders affecting many organ systems, including the GI tract, inner ear, CNS, or heart. Complications such as dehydration, electrolyte imbalance, and aspiration of gastric contents are primary concerns in treating nausea and vomiting.
- Stomatitis and oral mucositis are common disorders of the mouth, potentially having a significant effect on comfort and nutrition.
- Tobacco and alcohol use contribute to a number of upper GI disorders, including GERD, oral and esophageal cancers, and peptic ulcer disease. Encourage all clients to stop smoking or using smokeless tobacco and to consume alcohol in moderate amounts if at all to reduce their risk or these disorders.
- Gastroesophageal reflux disease (GERD) is common. While it often is considered to be a benign condition, prolonged exposure of the lower esophagus to gastric juices can lead to esophagitis, hemorrhage, and scarring.
- Both esophageal and gastric cancer often are diagnosed late in the disease because their symptoms may be vague. Encourage clients with complaints of dyphagia, a sensation of gastric fullness, or heartburn to seek medical evaluation. Surgical resection of the cancerous portion of the esophagus or stomach is the treatment of choice when the tumor is diagnosed early.
- Upper gastrointestinal bleeding can lead to significant blood loss and shock. Peptic ulcer disease accounts for the majority of UGI hemorrhage, although erosive gastritis and esophageal varices also are common causes.
- Acute gastritis, often associated with aspirin or NSAID use, is generally benign and self-limited. Erosive gastritis, a complication of critical conditions such as shock, trauma, a major burn, or head injury, can lead to unexpected gastric hemorrhage. Chronic gastritis is an unrelated disorder associated with *H. pylori* infection.
- *H. pylori* infection also is a major risk factor for peptic ulcer disease and gastric cancer. Effectively treating the infection can reduce or eliminate the risk of future exacerbations of PUD.
- An acute change in the nature of abdominal pain in a client with PUD, especially when accompanied by vomiting, guarding of the abdomen, or a change in bowel sounds, could indicate an obstruction or perforation and release of gastric contents into the peritoneal cavity.

TEST YOURSELF NCLEX-RN® REVIEW

1 The nurse assessing for oral cancer risk factors in a client with a persistent sore on his tongue asks about:
   1. consumption of highly spiced foods.
   2. thumb sucking or pacifier use as a child.
   3. regular use of dental floss.
   4. tobacco use in any form.

2 The nurse teaching a client with gastroesophageal reflux disease includes which of the following instructions? (Select all that apply.)
   1. This is a benign disease requiring no treatment.
   2. Elevate the head of the bed on 6- to 8-inch blocks.
   3. Stop taking the prescribed proton-pump inhibitor once symptoms are relieved.
   4. Peppermint and chocolate candies can help relieve symptoms.
   5. Avoid lying down for several hours after eating.

3 The nurse evaluates his teaching of a client with acute stress gastritis as effective when the client states that she will:
1. avoid using aspirin or NSAIDs for routine pain relief.
2. consume only bland foods.
3. return for yearly upper endoscopy exams.
4. fully cook all meat, poultry, and egg products.

4 The nurse identifies which of the following nursing diagnoses as highest priority for the client admitted with peptic ulcer disease and possible perforation?
1. *Acute Pain*
2. *Ineffective Health Maintenance*
3. *Nausea*
4. *Impaired Tissue Integrity: Gastrointestinal*

5 Following a partial gastrectomy for gastric cancer, a client complains of nausea, abdominal pain and cramping, and diarrhea after eating. Recognizing manifestations of dumping syndrome, the nurse recommends:
1. fasting for a period of 6 to 12 hours before meals.
2. decreasing the protein content of meals.
3. frequent small meals that contain solid foods or liquids, but not both.
4. a diet rich in carbohydrates to maintain blood glucose levels.

6 The nurse caring for a client with esophageal cancer affecting the middle portion of the esophagus would immediately report which of the following?
1. crackles in the base of the right lung
2. bright bleeding from the mouth
3. weight loss
4. difficulty swallowing solid foods

7 The physician has ordered omeprazole 20 mg twice daily, clarithromycin 500 mg twice daily, and amoxicillin 1 g daily for a client with peptic ulcer disease. It is most important for the nurse to instruct the client to:
1. stop the drugs immediately and notify the physician if a rash, hives, or itching develop.
2. consume 8 oz. of yogurt or buttermilk daily while taking these drugs.
3. take the drugs on an empty stomach, 1 hour before breakfast and at least 2 hours after dinner.
4. take the drugs with a full glass of water.

8 When planning care for a client with stomatitis, the nurse identifies which of the following as a priority intervention?
1. Assist to cleanse mouth with mouthwash following meals.
2. Allow client to select appealing foods from a menu.
3. Provide viscous lidocaine to relieve mouth pain before meals.
4. Refer the client to a smoking cessation program.

9 The evening following a gastric resection, the nurse notes that there has been no drainage from the nasogastric tube for the past 3 hours. The nurse should:
1. chart the finding.
2. reposition the nasogastric tube.
3. gently irrigate the tube with normal saline.
4. notify the surgeon.

10 A client with a history of peptic ulcer disease suddenly begins to complain of severe abdominal pain. The nurse should: (Select all that apply.)
1. administer the prescribed proton-pump inhibitor.
2. obtain an order for a narcotic analgesic.
3. withhold oral food and fluids.
4. place the client in Fowler's position.
5. notify the physician.

See Test Yourself answers in Appendix C.

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