6. Drug therapy. Many oral drugs irritate the GI tract and may cause diarrhea, including acarbose, antacids that contain magnesium, antibacterials, antineoplastic agents, colchicine, laxatives, metformin, metoclopramide, misoprostol, serotonin reuptake inhibitors, tacrine, and tacrolimus. Antibacterial drugs are commonly used offenders that also may cause diarrhea by altering the normal bacterial flora in the intestine.

   Antibiotic-associated colitis (also called pseudomembranous colitis and *Clostridium difficile* colitis) is a serious condition that results from oral or parenteral antibiotic therapy. By suppressing normal flora, antibiotics allow gram-positive, anaerobic *C. difficile* organisms to proliferate. The organisms produce a toxin that causes fever, abdominal pain, inflammatory lesions of the colon, and severe diarrhea with stools containing mucus, pus, and sometimes blood. Symptoms may develop within a few days or several weeks after the causative antibiotic is discontinued. Antibiotic-associated colitis is more often associated with ampicillin, cephalosporins, and clindamycin, but may occur with any antibiotic or combination of antibiotics that alters intestinal microbial flora.
7. Intestinal neoplasms. Tumors may increase intestinal motility by occupying space and stretching the intestinal wall. Diarrhea sometimes alternates with constipation in colon cancer.
8. Functional disorders. Diarrhea may be a symptom of stress or anxiety in some clients. No organic disease process can be found in such circumstances.
9. Hyperthyroidism. This condition increases bowel motility.
10. Surgical excision of portions of the intestine, especially the small intestine. Such procedures decrease the absorptive area and increase fluidity of stools.
11. Human immunodeficiency virus (HIV) infection/acquired immunodeficiency syndrome (AIDS). Diarrhea occurs in most clients with HIV infection, often as a chronic condition that contributes to malnutrition and weight loss. It may be caused by drug therapy, infection with a variety of microorganisms, or other factors.

Diarrhea may be acute or chronic and mild or severe. Most episodes of acute diarrhea are defensive mechanisms by which the body tries to rid itself of irritants, toxins, and infectious agents. These are usually self-limiting and subside within 24 to 48 hours without serious consequences. If severe or prolonged, acute diarrhea may lead to serious fluid and electrolyte depletion, especially in young children and older adults. Chronic diarrhea may cause malnutrition and anemia and is often characterized by remissions and exacerbations.

ANTIDIARRHEAL DRUGS

Antidiarrheal drugs include a variety of agents, most of which are discussed in other chapters. When used for treatment of diarrhea, the drugs may be given to relieve the symptom (nonspecific therapy) or the underlying cause of the symptom (specific therapy). Individual drugs are listed in Drugs at a Glance: Antidiarrheal Drugs.

Nonspecific Therapy

A major element of nonspecific therapy is adequate fluid and electrolyte replacement. When drug therapy is required, nonprescription antidiarrheal drugs (eg, loperamide) may be effective. **Loperamide** (Imodium) is a synthetic derivative of meperidine that decreases GI motility by its effect on intestinal muscles. Because loperamide does not penetrate the central nervous system (CNS) well, it does not cause the CNS effects associated with opioid use and lacks potential for abuse. Although adverse effects are generally few and mild, loperamide can cause abdominal pain, constipation, drowsiness, fatigue, nausea, and vomiting. For nonprescription use, dosages for adults should not exceed 8 mg/day; with supervision by a health care provider, maximum daily dosage is 16 mg/day. In general, loperamide should be discontinued after 48 hours if clinical improvement has not occurred.

Overall, opiates and opiate derivatives (see Chap. 6) are the most effective agents for symptomatic treatment of diarrhea. These drugs decrease diarrhea by slowing propulsive movements in the small and large intestines. Morphine, codeine, and related drugs are effective in relieving diarrhea but are rarely used for this purpose because of their adverse effects. Opiates have largely been replaced by the synthetic drugs diphenoxylate, loperamide, and difenoxin, which are used only for treatment of diarrhea and do not cause morphine-like adverse effects in recommended doses. Diphenoxylate and difenoxin require a prescription.

Bismuth salts have antibacterial and antiviral activity; bismuth subsalicylate (Pepto-Bismol, a commonly used over-the-counter drug) also has antisecretory and possibly anti-inflammatory effects because of its salicylate component.

Octreotide acetate is a synthetic form of somatostatin, a hormone produced in the anterior pituitary gland and in the pancreas. The drug may be effective in diarrhea because it decreases GI secretion and motility. It is used for diarrhea associated with carcinoid syndrome, intestinal tumors, HIV/AIDS, and diarrhea that does not respond to other antidiarrheal drugs.

Other nonspecific agents sometimes used in diarrhea are anticholinergics (see Chap. 21) and polycarbophil and psyllium preparations (see Chap. 61). Anticholinergic drugs, of which atropine is the prototype, are infrequently used because doses large enough to decrease intestinal motility and secretions cause intolerable adverse effects. The drugs are occasionally used to decrease abdominal cramping and pain (antispasmodic effects) associated with acute nonspecific diarrhea and chronic diarrhea associated with inflammatory bowel disease.

Polycarbophil (eg, FiberCon) and **psyllium** preparations (eg, Metamucil) are most often used as bulk-forming laxatives. They are occasionally used in diarrhea to decrease flu-

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