

orders, bradycardia, and Parkinson's disease. They also are used before surgery and bronchoscopy. **Drugs at a Glance: Selected Anticholinergic Drugs** describes the therapeutic use, dosage and route of administration of selected anticholinergic medications.

- **GI disorders** in which anticholinergics have been used include peptic ulcer disease, gastritis, pylorospasm, diverticulitis, ileitis, and ulcerative colitis. These conditions are often characterized by excessive gastric acid and abdominal pain because of increased motility and spasm of GI smooth muscle. In peptic ulcer disease, more effective drugs have been developed, and anticholinergics are rarely used. The drugs are weak inhibitors of gastric acid secretion even in maximal doses (which usually produce intolerable adverse effects). Although they do not heal peptic ulcers, they may relieve abdominal pain by relaxing GI smooth muscle.

Anticholinergics may be helpful in treating irritable colon or colitis, but they may be contraindicated in chronic inflammatory disorders (eg, diverticulitis, ulcerative colitis) or acute intestinal infections (eg, bacterial, viral, amebic). Other drugs are used to decrease diarrhea and intestinal motility in these conditions.

- In **genitourinary disorders**, anticholinergic drugs may be given for their antispasmodic effects on smooth muscle to relieve the symptoms of urinary incontinence and frequency that accompany an overactive bladder. In infections such as cystitis, urethritis, and prostatitis, the drugs decrease the frequency and pain of urination. The drugs are also given to increase bladder capacity in enuresis, paraplegia, or neurogenic bladder.
- In **ophthalmology**, anticholinergic drugs are applied topically for mydriatic and cycloplegic effects to aid examination or surgery. They are also used to treat some inflammatory disorders. Anticholinergic preparations used in ophthalmology are discussed further in Chapter 65.
- In **respiratory disorders** characterized by bronchoconstriction (ie, asthma, chronic bronchitis), ipratropium (Atrovent) may be given by inhalation for bronchodilating effects (see Chap. 47).
- In **cardiology**, atropine may be given to increase heart rate in bradycardia and heart block characterized by hypotension and shock.
- In **Parkinson's disease**, anticholinergic drugs are given for their central effects in decreasing salivation, spasticity, and tremors. They are used mainly in clients who have minimal symptoms, who do not respond to levodopa, or who cannot tolerate levodopa because of adverse reactions or contraindications. An additional use of anticholinergic drugs is to relieve Parkinson-like symptoms that occur with older antipsychotic drugs.
- **Before surgery**, anticholinergics are given to prevent vagal stimulation and potential bradycardia, hypotension, and cardiac arrest. They are also given to reduce respiratory tract secretions, especially in head and neck surgery and bronchoscopy.

Contraindications to Use

Contraindications to the use of anticholinergic drugs include any condition characterized by symptoms that would be aggravated by the drugs. Some of these are prostatic hypertrophy, myasthenia gravis, hyperthyroidism, glaucoma, tachyarrhythmias, myocardial infarction, and heart failure unless bradycardia is present. They should not be given in hiatal hernia or other conditions contributing to reflux esophagitis because the drugs delay gastric emptying, relax the cardioesophageal sphincter, and increase esophageal reflux.

INDIVIDUAL ANTICHOLINERGIC DRUGS

Belladonna Alkaloids and Derivatives

Atropine, the prototype of anticholinergic drugs, produces the same effects, has the same clinical indications for use, and has the same contraindications as those described earlier. In addition, it is used as an antidote for an overdose of cholinergic drugs and exposure to insecticides that have cholinergic effects.

Atropine is a naturally occurring belladonna alkaloid that can be extracted from the belladonna plant or prepared synthetically. It is usually prepared as atropine sulfate, a salt that is very soluble in water. It is well absorbed from the GI tract and distributed throughout the body. It crosses the blood–brain barrier to enter the CNS, where large doses produce stimulant effects and toxic doses produce depressant effects. Atropine is also absorbed systemically when applied locally to mucous membranes. The drug is rapidly excreted in the urine. Pharmacologic effects are of short duration except for ocular effects, which may last for several days.

Belladonna tincture is a mixture of alkaloids in an aqueous-alcohol solution. It is most often used in GI disorders for antispasmodic effect. It is an ingredient in several drug mixtures.

Homatropine hydrobromide (Homapin) is a semisynthetic derivative of atropine used as eye drops to produce mydriasis and cycloplegia. Homatropine may be preferable to atropine because ocular effects do not last as long.

Hyoscyamine (Anaspaz) is a belladonna alkaloid used in GI and genitourinary disorders characterized by spasm, increased secretion, and increased motility. It has the same effects as other atropine-like drugs.

Ipratropium (Atrovent) is an anticholinergic drug chemically related to atropine. When given as a nasal spray, it is useful in treating rhinorrhea due to allergy or the common cold. When given as an inhalation treatment or aerosol to patients with chronic obstructive pulmonary disease (COPD), it is beneficial as a bronchodilator. An advantage of administration of anticholinergic drugs by the respiratory route over systemic administration is less thickening of respiratory secretions and reduced incidence of mucus-plugged airways.

Scopolamine is similar to atropine in uses, adverse effects, and peripheral effects but different in central effects.