

Sympathomimetics (Adrenergic)

Adrenergic drugs are called sympathomimetics because they mimic the sympathetic nervous system and stimulate the fight-or-flight impulse. They work to stimulate the heart, increase blood flow to the skeletal muscles, and constrict peripheral blood vessels, which then dilate certain parts of the body, such as the bronchi for patients with asthma and pupils for patients who may be having an eye procedure. They are also used to restore heart rhythm during cardiac arrest and to increase blood pressure with drugs such as Levophed (norepinephrine) in cases of shock. They constrict capillaries if the patient is bleeding, such as during a nosebleed. The major contraindication for adrenergic drugs is hypersensitivity to the drug. These drugs should be used cautiously in patients with hypertension, myocardial infarction, atrial fibrillation, or hypovolemia, in children, and in women who are pregnant or breastfeeding.

Adrenergic Blockers

As the name suggests, adrenergic blockers block the action of adrenergics (naturally occurring substances in the body that stimulate the sympathetic nervous system) and thus have a parasympathetic effect. As discussed earlier, the parasympathetic effect calms the nervous system. Adrenergic blockers are useful for treating cardiac arrhythmias (heart rhythm problems), high blood pressure, migraine headaches, and chest pain because they slow the heart rate, relax the blood vessels, and allow blood to flow more freely, thus decreasing the workload on the heart.

Adrenergic blockers are broken down into two groups, based on the muscles they affect. Alpha blockers such as alfuzosin (Uroxatral), doxazosin (Cardura), prazosin (Minipress), tamsulosin (Flomax), and terazosin (Hytrin) affect vascular smooth muscle and are used to alleviate hypertension and benign prostatic hypertrophy (this condition, which affects the male reproductive and urinary systems, is discussed in Chapter 20). Beta blockers work by blocking the effects of the hormone epinephrine. This action affects the heart and blood vessels and causes the heart to beat more slowly and with less force, thereby reducing blood pressure. Beta blockers such as acebutolol (Sectral), atenolol (Tenormin), bisoprolol (Zebeta), metoprolol (Lopressor), nadolol (Corgard), nebivolol (Bystolic), and propranolol (Inderal LA) are used for hypertension, migraine headaches, and glaucoma.

Parasympathomimetics (Cholinergics)

Parasympathomimetics (cholinergics) are so named because they mimic the action of the parasympathetic nervous system; cholinergics release acetylcholine, which relaxes the body's fight-or-flight mechanism. Cholinergics are rarely used because they severely slow body system activity (including heart rate) and constrict respiratory passages. Nerve gases are an example of this class. One of the few cholinergic drugs still used is pilocarpine (Pilopine) for the treatment of open-angle glaucoma. This drug increases the drainage of fluid (aqueous humor) out of the eye to reduce ocular pressure. The drug must be stopped several weeks before surgical procedures because of an increased risk for intraoperative breathing problems.

Anticholinergics or Cholinergic Blockers

Anticholinergics or cholinergic blockers inhibit the parasympathetic branch of the autonomic nervous system and thus promote fight-or-flight symptoms. These drugs dry secretions, including those in the respiratory tract, and are used for asthma and motion sickness. They are also used for preoperative relaxation, for neuromuscular blocking of spasms, as antidotes to insect stings, and in cholinergic crises. A cholinergic crisis manifests with extreme muscular weakness and respiratory depression caused by surplus acetylcholine. This crisis is most commonly seen in patients with myasthenia gravis who are overmedicated with anticholinesterase drugs. In an emergency, atropine (Atropen) can be used to treat a slow heart rate, heart block, or bronchospasm.

■ MEDICATIONS TO CONTROL PAIN AND FEVER

Pain is an unpleasant sensory and emotional experience arising from actual or potential tissue damage. The perception of pain varies greatly among patients, but it is important to treat each person's pain based on his or her description of it. Pain management is based on a thorough patient assessment that includes the location and intensity of pain.