

systemically, usually in IV form, for acute or severe inflammation such as in spinal cord injury. Because of the serious side effects and danger of long-term suppression of the immune system, glucocorticoids must be used only as prescribed and discontinued gradually. (For a more complete list of glucocorticoids commonly used, please refer to the Master the Essentials table.)

Nasal Decongestants

Nasal decongestants such as tetrahydrozoline nasal (Tyzine Nasal) can alleviate nasal congestion intranasally by drying secretions. Nasal decongestants such as phenylpropanolamine are taken orally to produce the desired effects. They cause vasoconstriction on the adrenergic receptors in the nose by affecting the sympathetic tone of the blood vessels. The mucous membranes shrink as a result, thereby promoting drainage. These medications are typically used for only 3 to 5 days; otherwise, “rebound” nasal congestion occurs, and the patient continues to suffer.

Nonsteroidal Anti-Inflammatory Drugs

NSAIDs are by definition medications that reduce inflammation and do not contain steroids. They are the most common treatments for inflammation. In addition, NSAIDs also have antipyretic (fever reduction) and analgesic (pain reduction) properties. They accomplish these effects by inhibiting prostaglandin synthesis. Prostaglandins are substances responsible for producing inflammation, fever, and pain. NSAIDs such as ibuprofen (Advil, Motrin) and naproxen (Aleve, Naprosyn) can be purchased over the counter (OTC) and are taken by mouth. Other oral NSAIDs such as diclofenac (Zorvolex) and celecoxib (Celebrex) are available by prescription only for the treatment of conditions such as arthritis. Ketorolac (Toradol) is an NSAID that is given by the IV route for moderate to severe pain. As with all medications, NSAIDs must be taken as directed. Many medications in this class have similar mechanisms, but the patient’s response varies. A patient may respond poorly to one NSAID but report great relief from another.

Immunosuppressants

Immunosuppressants are typically used for long-term therapy of inflammatory diseases, such as rheumatoid arthritis, psoriasis, and Crohn’s disease. Rheumatoid arthritis is treated with immunosuppressants such as azathioprine (Imuran, Azasan) and cyclosporine (Neoral, Sandimmune, and Gengraf). Psoriasis (see Chapter 11) is treated with cyclosporine and sirolimus (Rapamune) for a short time (up to several months), alternating with other therapies. Crohn’s disease is treated with oral doses of azathioprine (Imuran, Azasan). Corticosteroids are sometimes prescribed for short periods of time to speed up the suppression of the immune system and thus the healing process in inflammatory diseases. Because long-term suppression of the immune system renders the body vulnerable to infection and certain cancers, the immunosuppressants listed here are used on a long-term basis only to prevent or treat rejection in relation to organ transplants.

Anti-Infective Medications

Anti-infective medications are classified by their mechanisms of action or chemical structure. They target the processes of the **pathogenic** (disease-causing) microorganism. Some medications target protein synthesis, others inhibit DNA or RNA synthesis, and still others destroy the cell wall. Anti-infective medications include antibiotics, antitoxins, and antifungal, antiviral, and antiparasitic medications. These medications are discussed in the following subsections.

Antibiotics

Antibiotics are prescribed to treat bacterial infections. Bacterial organisms have special characteristics: they do not require a **host** (e.g., person or animal) to reproduce, they can change or mutate, and all are potentially vulnerable to antibiotics. Bacteria are characterized and named based on their shapes and ability to retain stains, either gram negative or gram positive (A Closer Look 17.1). Common antibiotic categories include penicillins, cephalosporins, tetracyclines, macrolides, and aminoglycosides. A broad-spectrum antibiotic, one that is effective against many types of bacteria, is prescribed if the bacteria have not yet been identified.

One drawback of antibiotics is that when they kill the bacteria, they also kill healthy or normal flora that are usually present in the human body and are beneficial in helping us fight off infection and in aiding digestion. When these healthy bacteria are destroyed, a **superinfection** can arise. In other words,