

## Bronchodilator Medications

Bronchodilators relieve acute bronchospasm and include anticholinergics, xanthines (methylxanthines), and beta-adrenergic agonists. They relax the smooth muscle of the bronchi and allow the patient to breathe more easily. When inhaled, these drugs work immediately on the pulmonary system. When they are taken orally, it takes longer for the patient to feel the effect, but the action is of longer duration, and side effects may last longer as well.

### Anticholinergics

Parasympatholytics or anticholinergics dilate bronchi by blocking the action of acetylcholine, which causes bronchospasm. These medications when taken orally are used to prevent bronchospasms, not to treat those already in progress.

Because these drugs stimulate the sympathetic nervous system, the patient can expect a fight-or-flight response, including increased heart rate and blood pressure. This effect also dries up lung secretions and thereby decreases congestion and improves pulmonary function. Examples of anticholinergic bronchodilators include ipratropium bromide (Atrovent) and tiotropium (Spiriva). Both these medications are administered via inhalation and are prescribed for patients with bronchitis, emphysema, or COPD. Atrovent is inhaled as a mist, and Spiriva is inhaled in powder form.

### Xanthines (Methylxanthines)

Xanthines, also called methylxanthines, include theophylline and aminophylline. These medications relax smooth muscle and relieve bronchospasm. Asthma is the most common illness for which these medications are used. Because patients metabolize them at different rates, the dosage must be carefully adjusted based on the patient's reaction. These medications have a narrow safety margin. In other words, there is a small difference between the amount of medication needed to be effective and the amount that produces toxic effects in the patient. Careful monitoring is essential. IV aminophylline may be given as a continuous infusion for serious asthma attacks when the patient is hospitalized. Oral forms such as aminophylline (no brands available, only generic) and theophylline (Elixophyllin, Theo-Dur Sprinkles) should be taken on an empty stomach with a full glass of water, for faster absorption. However, taking this medication on a full stomach decreases gastric upset.

### Beta-Adrenergic Agonists

Beta-adrenergic agonists are bronchodilators that are commonly used for treating asthma (Fig. 18-2). They stimulate beta-2 receptor sites in the sympathetic nervous system and result in bronchial dilation. Short-acting agents include albuterol (Proventil, Ventolin), bitolterol (Tornalate), levalbuterol (Xopenex), isoproterenol (Isuprel), metaproterenol (Alupent, Metaprel), pirbuterol (Maxair), and

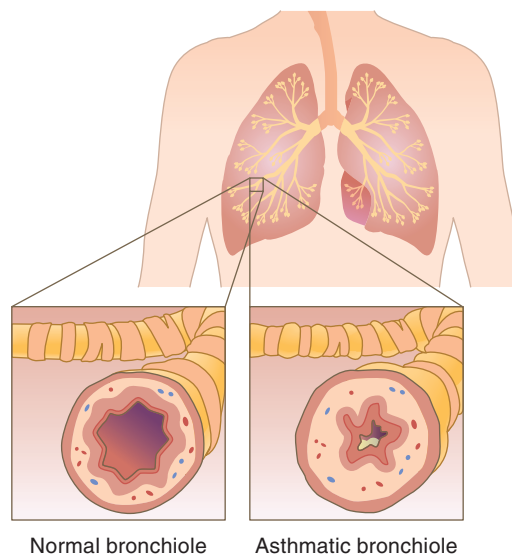


FIGURE 18-2: Asthma.

Normal bronchiole

Asthmatic bronchiole