Drug Therapy

Pharmacologic therapy is used to prevent and control asthma symptoms, reduce the frequency and severity of asthma exacerbations, and reverse airflow obstruction. A stepwise approach is recommended based on the severity of the child's asthma. Because inflammation is considered an early and persistent feature of asthma, therapy is directed toward long-term suppression of inflammation. The National Asthma Education and Prevention Program (2012) highlights that asthma control has two domains:

- Reducing impairment (associated with the frequency and intensity of symptoms and functional limitations experienced by the patient)
- Reducing risk (preventing future attacks, ED visits, and decline in lung function, as well as watching for medication side effects)

Asthma medications are categorized into two general classes: **long-term control medications (preventive medications)** to achieve and maintain control of inflammation, and **quick-relief medications (rescue medications)** to treat symptoms and exacerbations.

Quick-relief and long-term medications are often used in combination. Inhaled corticosteroids, cromolyn sodium, long-acting β_2-agonists (LABAs), methylxanthines, and leukotriene modifiers are used as long-term control medications. Short-acting β_2-agonists, anticholinergics, and systemic corticosteroids are used as quick-relief medications.

Many asthma medications are given by inhalation with a nebulizer or a **metered-dose inhaler (MDI)**. The MDI is always attached to a spacer, which can be equipped with a mask or a mouthpiece. Pharmaceutical companies are currently mandated to produce inhalers that do not contain chlorofluorocarbons (CFCs) as the propellant, because CFCs have been linked to damage and depletion of the earth's ozone level. Several currently available CFC-free MDI devices use dry powder (and are called *dry powder inhalers*); these include the Diskus inhaler and the Turbuhaler. These devices are breath activated, and the child needs to inhale as quickly and deeply as possible to use them effectively. The Diskhaler and Aerosolizer are similar; but with the Aerosolizer, the