

Asthma: What Is It?

Asthma occurs when the airways in the lungs become inflamed (swollen) and constrict (become smaller), making breathing difficult. No two children with asthma are alike. Each child has unique triggers for asthma that are warning signs of an acute asthma episode. The following is general information about asthma in children, adolescents and young adults. Always consult those caring for your child for more specific information.

Asthma affects all the airways in the respiratory system, from the windpipe (trachea) in the neck to the smallest airways in the lungs (bronchioles). The purpose of the airway is to carry air to and from the air sacs (alveoli) in the lungs. In these microscopic air sacs, oxygen is absorbed and carbon dioxide is given off.

Asthma affects the airways of children in three ways:

1. All children with asthma have **inflammation** of the lining of the airways. When the airway lining swells due to inflammation, there is less room for air to flow in and out. This swelling can last for weeks after an acute episode or may become a condition that never completely goes away.
2. **Bronchospasm** is caused by a tightening of the muscles that surround the airways. This narrows the airway preventing air from getting in or leaving the lungs.
3. **Excessive mucus** is produced and often blocks the airways.

Many things in the environment can cause or trigger an acute asthma episode. Some common "triggers" include cigarette smoke, viral infections in the respiratory tract (colds, bronchitis, flu), exercise, perfumes and other strong odors, and cold air. Air pollution, weather and climate changes also affect asthma symptoms. Pollens, house dust, molds and animal dander can trigger asthma in children with allergies.

An episode of asthma can occur suddenly, develop slowly with a gradual worsening of symptoms or exist as a chronic condition. Because symptoms vary from child to child and from episode to episode, three keys to successful treatment are:

- Individualized continuing care.
- Recognition of warning signs of an acute episode.
- Early treatment.

SUCCESSFUL TREATMENT

- Individualized continuing care is most important because asthma is a chronic illness. Your child needs regular medical care to control symptoms and prevent recurrent acute episodes.

- Early warning signs of an acute episode include difficulty in breathing, coughing or wheezing especially during activity, dark circles under the eyes or a feeling of tightness in the neck or chest and shortness of breath.
- A "peak flow" reading, done at home, can measure the airflow out of the lungs to determine if an acute asthma episode is about to occur or is getting worse.
- Early treatment for symptoms of airway obstruction should begin within five minutes. Early treatment of asthma symptoms with a bronchodilator requires less medication and is more effective than late treatment.

LATE SIGNS OF AN ASTHMA EPISODE REQUIRE *IMMEDIATE* EMERGENCY CARE.

Signs include:

- Difficulty breathing while walking or talking.
- A change in skin, fingernail or lip color to gray or blue.
- Inward movement of the muscles in the neck, chest or ribs or flaring of the nostrils.
- Failure of medications to reverse or control worsening symptoms.
- Declining peak flow readings in spite of medication use.

Medications:

Medications used in the treatment of asthma work to relieve and/or prevent symptoms by decreasing the inflammation and/or bronchoconstriction (swelling and spasm in the lungs).

- Bronchodilators such as albuterol and theophylline relax the muscles in and around the airways. Albuterol is inhaled into the airways directly and should relieve symptoms within 15 minutes. If breathing doesn't improve, give a second treatment immediately. If breathing symptoms still aren't relieved, call your doctor.
- Inhaled steroids or non-steroidal anti-inflammatory medications (such as cromolyn sodium, nedocromil or leukotriene modifiers) help prevent inflammation or swelling inside the airways. These medications are not used to treat acute airway spasm but are used to prevent spasm. Inhaled steroids help prevent airway inflammation. Oral steroids are used when the inhaled steroids have not worked to reduce airway swelling. Steroids also make the bronchodilators work better.

All medications may have side effects. Notify the doctor if side effects develop. It is very important to follow recommended timing and dosage of medications in order to treat asthma effectively.

Your child should be back to normal by the next day. If any of the above symptoms are noted, immediately call your doctor.

Additional Information Sources:

For more specific information about asthma in your child, talk with your health care provider. Additional information can be found in the Family Health Library at The Children's Hospital where the following books can be checked out, or they may be purchased at local bookstores.

- *Asthma and Allergy Action Plan for Kids*, by Allen J. Dozor and Kate Kelly; Fireside Books, 2004
- *The Children's Hospital of Philadelphia Guide to Asthma*, edited by Julian Lewis Allen, et al.; Wiley, 2004
- *The Harvard Medical School Guide to Taking Control of Asthma*, by Christopher H. Fanta; Free Press, 2003
- *Positive Options for Children with Asthma: Everything Parents Need to Know*, by O.P. Jaggi; Hunter House, 2005

Organizations:

- Allergy and Asthma Network/Mothers of Asthmatics, Inc.
800-878-4403 / 703-641-9595 www.aanma.org
- American Lung Association,
800-586-4872 / 212-315-8700 www.lungusa.org
- American Lung Association of Colorado,
303-388-4327 www.alacolo.org
- Asthma and Allergy Foundation of America
800-727-8462 www.aafa.org
- National Asthma Education & Prevention Program of the National Heart, Lung, and Blood Institute
301-435-0202 www.nhlbi.nih.gov
- National Jewish Center
800-222-LUNG (5864) www.njc.org