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Asthma Basics

About Asthma

Asthma is a lung condition that causes difficulty breathing, and it's common among kids and teens. Symptoms include coughing, wheezing, and shortness of breath. Anyone can have asthma, even infants, and the tendency to develop the condition is often inherited.

Asthma affects the bronchial tubes, or airways. When someone breathes normally, air is taken in through the nose or mouth and then goes into the trachea (windpipe), passing through the bronchial tubes, into the lungs, and finally back out again.

But people with asthma have inflamed airways that produce lots of thick mucus. They're also overly sensitive, or hyperreactive, to certain things, like exercise, dust, or cigarette smoke. This hyperreactivity causes the smooth muscle that surrounds the airways to tighten up. The combination of airway inflammation and muscle tightening narrows the airways and makes it difficult for air to move through.

More than 25 million people have asthma in the United States. In fact, it's the No. 1 reason kids chronically miss school. And flare-ups are the most common cause of pediatric emergency room visits due to a chronic illness.

Some kids have only mild, occasional symptoms or only show symptoms after exercising. Others have severe asthma that, left untreated, can dramatically limit how active they are and cause changes in lung function.

But thanks to new medications and treatment strategies, kids with asthma no longer need to sit on the sidelines, and parents no longer need to worry constantly about their child's well being.

With patient education and the right asthma management plan, families can learn to control symptoms and asthma flare-ups more independently, allowing kids to do just about anything they want.

About Asthma Flare-Ups

Many kids with asthma can breathe normally for weeks or months between **asthma flare-**

ups (also called asthma attacks, flares, episodes, or exacerbations) that cause the airways to narrow and become obstructed, making it difficult for air to move through them. Although flare-ups often seem to happen without warning, they usually develop over time during a complicated process of increasing airway obstruction.

All children with asthma have airways that are inflamed, which means that they swell and produce lots of thick mucus. In addition, their airways are overly sensitive, or **hyperreactive**, to certain asthma triggers.

When exposed to these triggers, the muscles surrounding the airways tend to tighten, which makes the already clogged airways even narrower. Things that trigger flare-ups differ from person to person. Some common triggers are exercise, allergies, viral infections, and smoke.

So an asthma flare-up is caused by three important changes in the airways:

1. **swelling** of the lining of the airways
2. **excess mucus** that results in congestion and mucus "plugs" that get caught in the narrowed airways
3. **bronchoconstriction**, which refers to the tightening of the muscles surrounding the airways

Together, the swelling, excess mucus, and bronchoconstriction narrow the airways and make it difficult to move air through (like breathing through a straw). During an asthma flare-up, kids may experience coughing, wheezing (a breezy whistling sound in the chest when breathing), chest tightness, increased heart rate, sweating, and shortness of breath.

How Is Asthma Diagnosed?

Diagnosing asthma can be tricky and time-consuming because kids with asthma can have very different patterns of symptoms. For example, some kids cough constantly at night but seem fine during the day, while others seem to get frequent chest colds that linger. It's not uncommon for kids to have symptoms like these for months before being seen by a doctor.

When considering a diagnosis of asthma, a doctor rules out other possible causes of the symptoms. He or she asks questions about the family's asthma and allergy history, performs a physical exam, and might order a chest X-rays or lung function tests.

During this process, parents must provide the doctor with detailed information, such as:

- **symptoms:** how severe they are, when and where they occur, how often they occur, and how long they last
- **allergies:** the child's and the family's allergy history
- **illnesses:** how often the child gets colds, how severe they are, and how long they last
- **triggers:** exposure to allergens and things in the air that can irritate the airways, recent life changes or stressful events, or other things that seem to lead to a flare-up

This information helps the doctor understand the pattern of symptoms, which can help determine what type of asthma the child has and how best to treat it.

To confirm the diagnosis of asthma, a breathing test may be done with a spirometer, a machine that analyzes airflow through the airways. A spirometer also can be used to see if

the child's breathing problems can be helped with medication, a primary characteristic of asthma.

The doctor may take a spirometer reading, give the child an inhaled medication that opens the airways, and then take another reading to see if breathing improves with medication. If medication reverses airway narrowing significantly, as indicated by improved airflow, then there's a strong possibility that the child has asthma.

If your child is diagnosed with asthma, it's important to learn how to manage asthma so it won't control your family. Educate yourself about asthma and learn to identify and eliminate triggers.

Help your child keep an asthma diary, develop and follow an asthma action plan, and take medications as prescribed. In addition, a **peak flow meter** — a handheld tool that measures breathing ability — can be used at home. When peak flow readings drop, it's a sign of increasing airway inflammation.

Exercise-Induced Asthma

Kids who have exercise-induced asthma (EIA) develop asthma symptoms after vigorous activity, such as running, swimming, or biking. Some develop symptoms only after physical exertion, while others have additional asthma triggers. With the proper medications, most kids with EIA can play sports like any other child. In fact, asthma affects more than 20% of elite athletes, and one in every six Olympic athletes, according to the American Academy of Allergy, Asthma, and Immunology.

Usually, a doctor can diagnose EIA after taking a history alone. But sometimes further tests, including an exercise challenge in a lung function laboratory, are needed to confirm the diagnosis. The doctor might want to target a child's tolerance for a particular exercise, as not every type or intensity of exercise affects kids with EIA the same way.

If exercise is the only asthma trigger, the doctor may prescribe a medication for the child to take before exercising to prevent airways from tightening up. Of course, even after taking a preventive medication, asthma flare-ups can still occur.

Parents or older kids should carry the proper rescue medication to all games and activities. Rescue medications work immediately to relieve asthma symptoms when they occur. The school nurse, coaches, club leaders (Boy Scouts, Girl Scouts, etc.), and teachers must be informed of a child's asthma plan of care so that kids take their medication as needed when away from home.

Allergy-Triggered Asthma

An estimated 75% to 85% of people with asthma have some type of allergy. Even if the primary triggers are colds or exercise, allergies can sometimes play a minor role in aggravating the condition.

How do allergies cause flare-ups in kids with asthma? Kids inherit the tendency to have allergies from their parents. With any kind of allergy, the immune system overreacts to normally harmless allergens. Those substances, such as pollen, can cause allergic reactions in some people. As part of this overreaction, the body produces an antibody called

immunoglobulin E (IgE) type, which specifically recognizes and attaches to the allergen when the body is exposed to it.

When this happens, it sets a process in motion resulting in the release of certain substances in the body. One of them is histamine, which causes allergic symptoms that can affect the eyes, nose, throat, skin, gastrointestinal tract, or lungs. When the airways in the lungs are affected, symptoms of asthma can occur.

The released histamine is what causes the familiar sneezing, runny nose, and itchy, watery eyes associated with some allergies — ways the body attempts to rid itself of the invading allergen. In kids with asthma, histamine can also trigger asthma symptoms and flare-ups.

An allergist can usually pinpoint allergies and, once identified, the best treatment is to avoid exposure to allergens whenever possible. Environmental control measures for the home can help reduce exposure to allergens. When avoidance isn't possible, antihistamine medications may be prescribed to block the release of histamine in the body.

Nasal steroids may be given to block allergic inflammation in the nose. In some cases, an allergist can prescribe immunotherapy, a series of allergy shots that gradually make the body unresponsive to specific allergens.

Asthma Categories

The severity of a child's asthma symptoms will fall into one of four main categories of asthma, each with different characteristics and requiring different treatment approaches:

1. **Mild intermittent asthma**
   A child who has brief episodes of wheezing, coughing, or shortness of breath occurring no more than twice a week is said to have mild intermittent asthma. Symptoms between flare-ups are rare, with the exception of one or two instances per month of mild symptoms at night.
2. **Mild persistent asthma**
   Kids with episodes of wheezing, coughing, or shortness of breath that occur more than twice a week but less than once a day are said to have mild persistent asthma. Symptoms usually occur at least twice a month at night and flare-ups may affect normal physical activity.
3. **Moderate persistent asthma**
   Kids with moderate persistent asthma have daily symptoms and require daily medication. Nighttime symptoms occur more than once a week. Flare-ups occur more than twice a week, last for several days, and usually affect normal physical activity.
4. **Severe persistent asthma**
   Kids with severe persistent asthma have symptoms continuously. They tend to have frequent flare-ups that may require emergency treatment and even hospitalization. Many children with severe persistent asthma have frequent symptoms at night and can handle only limited physical activity.

Asthma severity can both worsen and improve over time, placing a child in a new asthma category that requires different treatment.

All kids with asthma should follow a custom asthma action plan to control symptoms. And even mild asthma should never be ignored because airway inflammation is present even in

between flare-ups.

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