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About Asthma

Asthma affects an estimated 21.9 million Americans and is one of the leading causes of work and school absences. The cost in direct medical care and indirect expenses totals more than \$16.1 billion each year. Although the exact cause of asthma remains unknown, many treatment options are available to control and reverse this chronic inflammation of the lungs' airways.

What is asthma?

Asthma occurs when the linings of airways become inflamed and swollen and muscle spasms constrict airflow to the lungs. An "asthma attack" is characterized by labored or restricted breathing, a tight feeling in the chest, coughing and wheezing. The condition can develop quickly and may vary in severity from mild discomfort to life-threatening attacks in which breathing stops altogether. Sometimes, a chronic cough is the only symptom, and many cases of the disease go undiagnosed.

Who gets asthma?

Asthma can occur at any age but is more common in children than adults. Heredity can play a role. In young children, boys are nearly twice as likely as girls to develop asthma, but this sex difference tends to disappear in older age groups. Obesity is a newly-identified risk factor for asthma.

What causes asthma?

People generally think of asthma in terms of episodes or attacks. Actually, the asthmatic condition is always present, but symptoms may be dormant until "triggered" by an allergen, respiratory infection or cold weather. Other triggers may include aspirin, environmental irritants, physical exertion and, less commonly, food additives and preservatives.

Allergens are substances that cause no problem for a majority of people but which trigger an allergic reaction in susceptible individuals. Allergens are a major source of breathing problems in both children and adults. Common allergens include plant pollen (tree, grass and weed), dander from pets and other animals, house dust mites, cockroaches, molds and certain foods. When an allergic individual comes in contact with one of these allergens, a complicated series of events causes the body to release chemicals called mediators. These mediators often trigger asthma episodes.

Cold air, smoke, industrial chemicals, perfume and paint and gasoline fumes are all examples of environmental irritants that can provoke asthma. They probably trigger asthma symptoms by stimulating irritant receptors in the respiratory tract. These receptors, in turn, cause the muscles surrounding the airway to constrict, resulting in an asthma attack.

Viral respiratory infections are the leading cause of acute asthma attacks. Surprisingly, bacterial infections, with the exception of sinusitis, do not bring about asthma attacks. Some people with “heartburn” can have asthma symptoms when stomach acid backs up into the esophagus.

Aspirin and aspirin-containing products can trigger asthma attacks in susceptible individuals. Five percent of people with asthma experience a significant decrease in lung function after taking aspirin. Similar reactions can occur with other over-the-counter pain relievers such as ibuprofen. As a general rule, people with asthma should avoid these products.

Another type of prescription medication that can cause problems is the group of drugs called “beta-blockers,” which often are prescribed for high blood pressure, glaucoma, migraine headaches and angina. Beta-blockers can cause airway constriction called bronchospasm, so it is important for asthma patients to consult a physician about the use of these medications.

Although food additives can trigger asthma, this is rare. The most common food trigger is sulfites, a preservative used in products such as frozen potatoes and some beers and wines.

What happens in an asthma attack?

Because of asthma’s chronic, low-grade inflammation and irritation of the bronchial tube lining, airways can become “twitchy” and narrowed in response to

certain triggers. During an asthma attack, the muscles that surround the bronchial tubes contract, further narrowing the air passages.

With worsening of asthma, inflammation of the lining of the airways increases and produces swelling and further reduces airway size. In addition, glands in the lining of the air passages secrete excess mucus that accumulates in the already-narrowed air passages. Air is trapped behind the narrowed bronchial tubes, and there is a decrease in the oxygen available to the body. The result is that breathing, especially exhaling, becomes extremely noisy.

How long does an asthma attack last?

The duration of an asthma attack can vary according to the type of trigger that caused it and how long the airways have been inflamed. While mild episodes may last only a few minutes, more severe episodes can last from hours to days. Mild attacks can resolve spontaneously or may require medication. More severe attacks can be shortened with appropriate treatment.

What should be done during an attack?

Always follow the instructions of a physician. People with asthma should have an action plan for dealing with an acute attack. In general, it is important to stay calm and take prescribed medications. Quick-relief medications, including short-acting, rapid-onset inhaled beta2-agonist bronchodilators, anticholinergics and systemic corticosteroids are used to treat asthma attacks and are taken on an as-needed basis. They relieve symptoms rapidly by relaxing the muscles surrounding the airways, helping open the bronchial tubes.

What about longer-term treatment?

Prevention is always the best strategy. A person with asthma should know what situations prompt an attack, such as exposure to allergens, respiratory infections and cold weather, and to avoid these situations whenever possible. If asthma attacks are severe, unpredictable or flare up more than twice a week, then treatment with a long-term control medication is recommended. Long-term medications are preventive, taken daily and can achieve and maintain control of asthma symptoms.

Because inflammation of the lungs and airways plays a critical role in asthma, the most effective medications for long-term control have anti-inflammatory

effects. Various forms of anti-inflammatory medication are available and should be discussed with a physician.

One of the most effective anti-inflammatory medications for controlling asthma is inhaled corticosteroids. Taken early and as directed, these medications can improve asthma control, normalize lung function, and possibly prevent irreversible injury to lung airways. Often a single dose taken daily is enough to control asthma. Other anti-inflammatory medications include cromolyn and nedocromil.

Other medications for long-term control of asthma are long-acting inhaled or oral bronchodilators (beta agonists), long-acting theophylline or regular use of oral corticosteroids. Combination therapy (inhaled corticosteroid plus a long-acting beta2-agonist) is the preferred treatment for asthma when inhaled corticosteroids alone do not control the disease.

Unless directed by a physician, asthma patients should never change or discontinue preventive medications, and should always keep an adequate supply available.

For people with allergic asthma, immunotherapy (allergy vaccinations) may offer relief from symptoms prompted by allergens that act as triggers and cannot be avoided. Immunotherapy increases a patient's tolerance to the allergens that prompt asthma symptoms. A recent treatment option called anti-IgE stops an allergic reaction before it begins, helping prevent asthma attacks by blocking the antibody that causes the reaction. The treatment is approved for patients age 12 and older who have moderate-to-severe allergic asthma.

Are corticosteroids safe?

Taken as directed, inhaled corticosteroids are safe, well-tolerated and one of the most effective medications for controlling asthma. Some studies have suggested that inhaled corticosteroids may slightly reduce the rate of growth in children, perhaps by 1 centimeter per year. The reduction may be related to dosage and how long a child takes the drug. The long-term effects of any reduction in growth rate on final adult height are unknown.

Consequently, it is recommended that physicians use the lowest effective dose of these drugs and that they routinely monitor their patients' growth rates. Patients should discuss any concerns with their child's physician and never change or discontinue prescribed asthma medications unless advised by their doctor.

Is there a cure for asthma?

Although asthma symptoms are controllable, a cure for asthma has remained elusive. Preventive treatment, however, should minimize the difficulty an individual experiences with asthma, and allow a normal, active lifestyle.

When should a person see an allergist?

If an individual is having difficulty breathing or is coughing or wheezing, an allergist can help determine the cause of the condition and provide treatment that controls or eliminates the symptoms. Individuals should see an allergist if:

- Breathing difficulties are interfering with daily activities;
- Breathing problems are decreasing the quality of life;
- The warning signs of asthma, are present, including:
 - shortness of breath, wheezing or coughing, especially at night or after exercise,
 - tightness in the chest, frequent attacks of breathlessness, despite previous diagnosis and treatment for asthma.

An allergist is a physician who specializes in the diagnosis and treatment of asthma and allergies. The allergist has passed a qualifying examination and is specially trained to identify the factors that trigger asthma or allergies, and help the patient prevent or treat the condition.

After earning a medical degree, the allergist completes a three-year residency training program in either internal medicine or pediatrics, followed by a two- or three-year program of study in the field of allergy and immunology. You can be certain that your physician has met these requirements if he or she is certified by the American Board of Allergy and Immunology.

What is the difference between allergic disease and asthma?

Asthma is inflammation and obstruction of airflow in the bronchial tubes. Allergies are just one of the factors that can trigger asthma attacks. Not all people with asthma are allergic, and there are many people who have allergies but do *not* have asthma.

Why does physical exertion sometimes cause an asthma attack?

During exercise, rapid breathing occurs through the mouth. As a result, the air that reaches the bronchial tubes has not been warmed and humidified by passing through the nose. This cold, dry air can trigger asthma symptoms. It usually takes six to eight minutes of sustained aerobic exercise to bring out asthma symptoms, which may then occur for several minutes after the exercise has been completed.

If asthma symptoms begin after fewer than six to eight minutes of hard exercise or during or after very mild exercise, a person's asthma may be out of control and these symptoms should be discussed with a physician. More than 70 percent of all people with asthma suffer some degree of exercise-induced asthma, which is usually preventable.

Should persons with asthma avoid sports and exercise?

By taking preventive measures, people with asthma should be able to compete in sports. However, not all sports are tolerated equally well. In general, exercise and most sports that involve prolonged periods of running are more likely to provoke asthma attacks than non-aerobic ones.

Swimming is one of the best-tolerated sports. In most instances, pre-exercise medications and warmup exercises enable participation. Many Olympic athletes, including several gold medal winners, have had asthma.

Is asthma a psychological disorder?

Asthma is not a psychological or emotional disorder, but sometimes a physical display of strong emotion – such as shouting, crying, laughing or rapid breathing – may contribute to an asthma episode. Panic can prevent a person with asthma from relaxing and following instructions properly, which is essential during an attack. Medical scientists have found that behaviors associated with strong emotions can cause bronchial tubes to constrict, which may provoke or worsen an attack.

A chronic disease, such as asthma, can cause emotional strain. Depression may set in when those with asthma believe they cannot participate in normal activities. As a leading cause of work and school absences, asthma can have a significant effect on livelihood, education and emotional well being.

Is asthma life-threatening?

In severe and poorly-controlled cases, asthma can be life-threatening, and the death rate and prevalence of asthma have increased significantly since the late 1970s. Deaths occur more frequently in adults. If there is a single factor leading to severe or fatal asthma attacks, it appears to be a delay in administering appropriate drug therapy.

Working in partnership with an allergist, having an action plan, recognizing the triggers and early warning signals of an impending attack, and using a peak flow meter to detect the degree of bronchial obstruction, can all contribute to a decrease in the frequency and severity of attacks.

Will some children outgrow asthma?

The idea that asthma will be outgrown is more myth than reality. It is true that some individuals may reach a point they no longer suffer from symptoms as frequently as they did in earlier years. However, the possibility of having an asthma episode always exists.

What should parents do?

Allergists provide the following tips for parents of children with asthma:

- Above all else, learn everything possible about asthma.
- If a child misses school because of asthma, it's probably a sign that the treatment program should be re-evaluated.
- Understand the household and other environmental factors that trigger a child's attacks and avoid them as best as possible.
- Recognize the signs of an oncoming attack and learn to judge its severity.
- Provide preventive care so the child has the least amount of difficulty with his or her asthma.
- Teach the child self-care.
- Be sure the child is using the asthma medications exactly the way the physician prescribed and is using an inhaler properly.

- If the physician has suggested using a peak flow meter and diary to assess the child's level of asthma, be sure they are being used properly.
- Ask for some of the excellent educational materials and programs that are available, including asthma camps.
- Attend a free asthma screening. In addition to helping find adults and children at risk for asthma, screenings also provide an opportunity for diagnosed asthmatics to talk with a specialist about their disease and how to keep symptoms under control. A list of screening sites is posted at www.aacai.org.

Summary

Although no cure exists for asthma, effective treatments are available. We learn more about asthma every year and newer, more effective drugs are being developed. As a result, most people with asthma live normal, productive lives. Research is continuing, and the outlook is bright. For personalized information about asthma, talk with an allergist.