

# Lung Disease

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**L**ung diseases have a significant impact on the health of the United States population. The most common are asthma and chronic obstructive pulmonary disease (COPD). Both of these respiratory conditions can result in significant shortness of breath mainly caused by narrowing of the airways (the bronchi of the lungs) or, in the case of emphysema (a disease that can cause COPD), destruction of the alveoli (the sacs where oxygen is taken up by the blood). Asthma is an episodic problem, and during an attack, the muscles of the bronchi constrict, leading to narrowing of the airways. This narrowing can be so severe that shortness of breath occurs even at rest, impairing oxygenation and carbon dioxide clearance, which can be severe enough to cause death. In COPD, the smaller airways are usually narrowed because of excess inflammation and mucus production (as seen in chronic bronchitis, a disease that can cause COPD), and in addition, in some cases there is destruction of lung tissue (as seen in emphysema). So patients with COPD can be short of breath all of the time, while also experiencing exacerbations or flares related to episodic increases in small airway inflammation that can be brought on by infections or exposure to irritants.

Asthma affects people of all races and ethnicities, young and old alike. According to the Centers for Disease Control and Prevention, 1 in 12 adults and 1 in 11 children have asthma, and worldwide it is estimated that 300 million persons are affected. Asthma is a condition where your airways become narrow and swell and often produce extra mucus. Such airway issues in asthma often lead to symptoms that include wheezing (an audible whistling heard near the chest coming from the lungs), cough-

ing, and trouble breathing. While there is no known cure for asthma, most people can control their symptoms and lead normal lives. Control of asthma involves lifestyle changes as well as medications at times. Lifestyle changes include avoidance of triggers that patients recognize will lead to an asthma attack. These can include house dust, mold, animal dander or other environmental allergens, strong odors, smoking, weather changes, or even gastroesophageal reflux disease (GERD). If avoidance alone does not improve symptoms, then patients may be prescribed inhalers and other medications.

## **Who is at risk?**

Although asthma can occur at any age, childhood onset is typical, and the incidence in younger people is increasing. In particular, asthma among African American children grew 50 percent from 2001 to 2009. It is important for patients to discuss with their health care providers if they are having trouble breathing, or frequent periods of coughing, which can be a sign of new-onset asthma, regardless of age. Asthma can be a stand-alone disease, but it also can be associated with other diseases, such as with allergies and allergic rhinitis. To determine if you have asthma, a detailed history of symptoms is the first step. Afterward, health care providers may order other tests (such as lung function tests, called pulmonary function tests) and have patients keep a record of their symptoms or test how much air they can blow out quickly (peak flow) in what is called a peak-flow diary.

Those who are at greatest risk for developing COPD are current and former smokers. While there are other causes of COPD, to-

bacco use continues to be the primary cause of COPD in over 80-90 percent of cases. Usually a diagnosis of COPD is determined based upon the patient's history, but the severity of the disease is best assessed with lung function testing, often called pulmonary function tests. Other diagnostic tests are also ordered and may include imaging of the chest with a chest X-ray and/or chest CT scan.

### **The Risks of Ignoring Information on Asthma and COPD**

Millions of people who have COPD or asthma have ongoing symptoms that prevent them from performing their daily activities. Poorly controlled COPD and asthma can lead to days missed from work and school and even death. Patients with COPD or asthma are also at risk of having exacerbations, or a sudden worsening of their symptoms. Exacerbations are characterized by more coughing than usual and more difficulty breathing. These exacerbations can result in hospitalizations, and in some severe cases, death. However, exacerbations can be prevented with proper medical attention and one key step: stopping smoking. If diagnosed with asthma or COPD, discuss with your health care provider the best ways to prevent an exacerbation, and if you smoke, ask for strategies and resources to help you stop.

### **What Can Be Done to Prevent Asthma and COPD and Their Exacerbations?**

**Stop smoking.** For COPD, the major risk factor is smoking. Stopping smoking is key to preventing COPD from occurring, or if one has COPD, keeping it from worsening. Smoking, as well as secondhand smoke, can also make controlling asthma difficult and should be avoided by patients with asthma. The importance of helping patients stop smoking and helping children avoid exposure to smoking cannot be emphasized enough. Parents who

smoke around children with asthma put them at risk for troubled breathing, which may result in missed school days and even hospitalizations. Parents need to be educated about the hazards of smoking, and any misconceptions (e.g., smoking outside is safe as long as it is not around the child) must be corrected.

**Vaccinations.** Vaccinations against infections known to target the lungs are another way to prevent exacerbations of asthma and COPD. Having a lung disease, even if there are no active symptoms, places individuals at higher risk for complications from the flu and pneumonia. Strategies focusing on flu and pneumonia vaccinations can help in preventing these infections from causing exacerbations in people with asthma or COPD. Discussions should be held with one's health care provider regarding the best time to receive these vaccines.

**Home Ventilation.** Indoor air pollutants have been found to be linked to poorly controlled asthma and COPD symptoms. In rural areas, cooking with wood and coal in homes with poor ventilation often produces high levels of particulate matter and nitrogen dioxide, which in turn lead to worsening asthma and COPD symptoms.

**Lifestyle.** Obesity and diet have been shown to contribute to poor asthma and COPD control. Lifestyle changes should focus on good dietary habits and regular exercise. These lifestyle changes will have a beneficial impact on the body as a whole, not just the lungs.