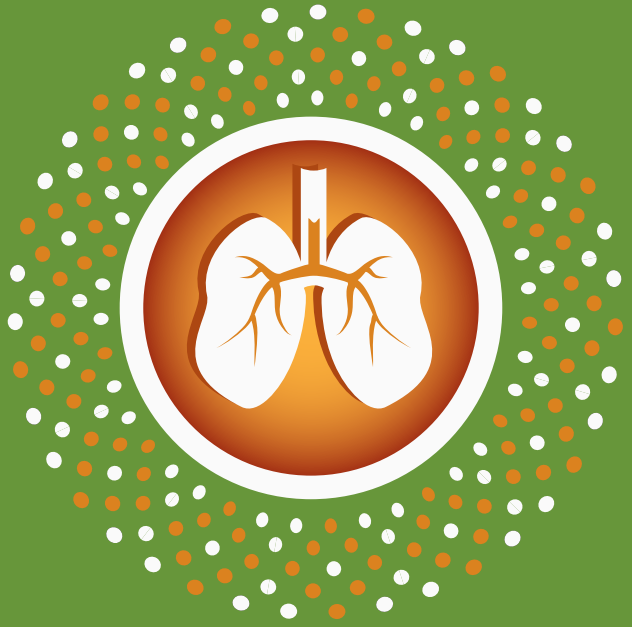
COPD and Asthma

Differential Diagnosis

Chronic Obstructive Pulmonary Disease (COPD) is the third

leading cause of death in America.



Learning Objectives

- Use tools to effectively diagnose chronic obstructive pulmonary disease (COPD) and asthma, and help patients self-manage these chronic diseases.
- Understand the importance of short- and long-term monitoring, maximizing lung function, and managing exacerbations and airflow limitations.

According to the Centers for Disease Control's (CDC) National Asthma Control Program, asthma is getting worse. In the last decade, the proportion of people with asthma in the United States grew by nearly 15%. Asthma led to:

- 439,400 hospitalizations (2010)
- 1.8 million emergency department visits (2011)
- 14.2 million physician office visits (2010)

The American Lung Association reports that COPD is the third leading cause of death in America, claiming the lives of 134,676 Americans in 2010.

Differentiating chronic obstructive pulmonary disease (COPD) from asthma can be complicated, especially in older adults and individuals who smoke. Initial diagnosis of these conditions requires the identification of patients at risk of, or likely to have, chronic airways disease. Asthma-COPD overlap syndrome (ACOS), which shares features with both asthma and COPD, should also be considered.

Epidemiology of COPD and Asthma

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) defines COPD as "a common preventable and treatable disease, characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lungs to noxious particles or gases." It is estimated that 12.7 million individuals 18 years and older in the U.S. have been diagnosed with COPD. However, approximately 24 million adults in the U.S. have evidence of impaired lung function, which indicates that COPD may be underdiagnosed.

The prevalence of COPD varies considerably by state, from less than 4% in Washington and Minnesota to greater than 9% in Alabama and Kentucky. The median prevalence in the United States is 5.8%. The states with the highest prevalence of COPD—Alabama, Illinois, Kentucky, Oklahoma, Tennessee, and West Virginia—are clustered along the Ohio and lower Mississippi rivers.

The Global Initiative for Asthma (GINA) defines asthma as "a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable expiratory airflow limitation." Unlike COPD, which typically develops later in life, asthma most often begins in childhood. According to the CDC, more than 6 million children and 16.5 million adults in the U.S. have asthma.

Medical and Economic Burden of COPD and Asthma

In 2010, COPD was the primary diagnosis in 10.3 million physician office visits, 1.5 million emergency department (ED) visits, and 699,000 hospital discharges. According to the American Lung Association, the United States spent $29.5 billion in direct costs and $20.4 billion in indirect costs for COPD in 2011. Much of the direct cost of COPD is for hospitalizations following exacerbations.

In 2010, asthma was the primary diagnosis in 14.2 million physician office visits and there were 1.8 million ED visits for asthma in 2011. Nearly 1 in 5 children who had asthma went to an emergency department for care in 2009. According to one study, asthma costs the United States $56 billion each year.

Disease Burden and Treatment Needs in Diverse Patient Populations

Asthma prevalence and outcomes reveal significant disparities. Physicians are an important part of effective asthma management, but patients in some minority groups may not see a physician regularly as part of their asthma care. According to the National Institutes of Health (NIH), asthma is more common and more severe among women; children; low-income, inner-city residents; and African-American and Puerto Rican communities. Social, economic, and cultural factors—ranging from lack of access to quality health care to differences in health beliefs between patients and their physicians—contribute to a greater burden of asthma on some patients. In addition, gaps in the implementation of clinical practice guidelines for asthma contribute to the ongoing problem of asthma-related health disparities among at-risk groups. These disparities in asthma care and burden suggest that culturally competent clinical and educational approaches are needed.

The Guidelines for the Diagnosis and Management of Asthma provides guidelines that emphasize the importance of asthma control and introduces approaches for monitoring asthma in high-risk groups and other patients with asthma.

The six key messages from the guidelines are:

- **Assess asthma severity at the initial visit to determine initial treatment**
- **Use written asthma action plans to guide patient self-management**
- **Use inhaled corticosteroids to control asthma**
- **Assess and monitor asthma control and adjust treatment, if needed**
- **Schedule follow-up visits at periodic intervals**
- **Control environmental exposures that worsen the patient's asthma**

Differential Diagnosis/Syndromic Diagnosis for COPD and Asthma

Though the most common diagnostic dilemma is differentiating COPD from asthma, many other illnesses share symptoms and/or physical findings with COPD. Most can be excluded without an extensive evaluation. Some may require the judicious use of select tests. Differential diagnosis of COPD must take into consideration the symptom complex obtained from the patient's history and physical examination findings. Spirometry should be performed to make the diagnosis of COPD.

As noted previously, asthma is the most common alternative diagnosis to COPD. Its symptoms (e.g., shortness of breath, chronic cough, etc.) can mimic COPD. Take into account clinical characteristics and epidemiological factors to narrow down the diagnosis. Smoking incidence and childhood exposure to secondhand smoke are important risk factors for COPD that are more likely to be present in individuals of lower socioeconomic status. However, given the higher incidence of asthma in certain populations, the risks of COPD and asthma may overlap.

In light of the common features of asthma and COPD, an approach that focuses on the features that are most helpful in distinguishing asthma from COPD is recommended. The diagnostic profile of asthma or COPD can be assembled from a careful history that considers age; symptoms (in particular, onset and progression, variability, seasonality or periodicity, and persistence); history; social and occupational risk factors (including smoking history, previous diagnoses, and treatment); and response to treatment.

The primary features of asthma include the following:

- Onset before age 20 years
- Symptoms that vary over time, often limiting activity
- A record (e.g., spirometry, peak expiratory flow [PEF]) of variable airflow limitation
- Family history of asthma or other allergic condition
- Lung function that may be normal between symptoms
- Symptoms that vary either seasonally or from year to year
- Symptoms that improve spontaneously or have an immediate response to bronchodilator treatment or to inhaled corticosteroids (ICS) over a period of weeks
- Normal chest X-ray

The primary features of COPD include the following:

- Onset after age 40
- Persistence of symptoms despite treatment
- Abnormal lung function between symptoms
- Heavy exposure to risk factors, such as tobacco smoke or biomass fuels
- Symptoms that worsen slowly over time (i.e., progressive course over years)
- Limited relief from rapid-acting bronchodilator treatment
- Severe hyperinflation or other changes on chest X-ray

Keep in mind that individuals who have COPD often do not know they have it, do not know when it developed, or are unaware of the severity of their condition. They develop exercise intolerance because of air trapping and exertional dyspnea-related chest expansion. Consequently, they minimize their exercise and attribute deconditioning to normal aging. Therefore, they do not experience dyspnea and may respond to open-ended questions by saying that they are “breathing fine.” If these patients do not have exacerbations, their COPD may not interfere with their lives. However, some individuals who have COPD have significant interference with function or frequent exacerbations, and these patients have progressive decline in lung function.

Distinguishing between COPD and asthma can have important implications in terms of management and life expectancy. The clinical examination may suggest asthma or COPD, but no set of clinical findings is diagnostic.

There is a strong likelihood of correct diagnosis if a patient presents with three or more of the features listed for either asthma or COPD in the absence of features of the alternative diagnosis. However, the absence of any of these features has less predictive value and does not rule out the diagnosis of either disease.

COPD and Asthma Management in Primary Care

Short- and Long-term Monitoring

COPD worsens over time, so routine follow up and monitoring is essential. Perform spirometry yearly to identify patients who are experiencing a rapid decline. Ask specific questions about the patient's well-being (e.g., by using a questionnaire such as the COPD Assessment Test) every three months. Assess symptoms (e.g., cough, sputum production, dyspnea, limitations of activity, and sleep disturbances) and smoking status at every visit.

Exacerbation Management and Lung Function

Smoking cessation is key for all patients who smoke and have COPD. Medications are used to reduce symptoms, reduce the frequency and severity of exacerbations, and improve exercise tolerance. Long-acting formulations are preferred. Current medications for COPD have not been shown to lessen the long-term decline in lung function.

The most common cause of COPD exacerbations is viral or bacterial infection. The medication classes most commonly used to manage exacerbations are bronchodilators, steroids, and antibiotics. Short-acting β_2-agonists are preferred in the acute setting. Systemic steroids may shorten recovery time, improve FEV1, and improve hypoxemia, but long-term management of COPD with oral steroid medicines is not recommended due to steroid myopathy.

An as-needed short acting β_2-agonist (SABA) alone is considered the first step in treatment for asthma. Regular, daily, low-dose ICS treatment, plus an as-needed SABA, is highly effective to reduce asthma-related exacerbations, symptoms, hospitalizations, and mortality. For patients whose symptoms and/or exacerbations persist in spite of management with low-dose ICS, plus an as-needed SABA, a step up in treatment should be considered. However, patients should first be asked about treatment adherence, inhaler techniques, comorbidities, and level of exposure to allergens.

Dual Bronchodilation

For COPD, initial treatment should provide appropriate management of symptoms with bronchodilators or combination therapy, but not with ICS alone. Asthma should be managed with suitable controller therapy, including ICS, but not with long-acting bronchodilators alone.

Bronchodilators increase FEV1 by alternating smooth muscle tone. The two classes of bronchodilators are β_2-agonists and anticholinergics. More recently, a combination of the long-acting anticholinergic umeclidinium and the long-acting β_2-agonist vilanterol became available in a once-daily inhaled preparation. Additionally, there are combinations of a long-acting bronchodilator and anticholinergic, as well as long-acting anti-muscarinic agents (LAMAs) on the market and in development.

Conclusions and Recommendations

The most effective treatment for COPD or asthma is a partnership between the patient and his or her physician. Support patient self-management of COPD or asthma by encouraging smoking cessation, providing routine monitoring, promoting medication regimen adherence, and encouraging physical fitness. Patients should be trained to use inhaler devices properly in order to manage their condition effectively.

AAFP's tobacco cessation program, "Ask and Act," encourages family physicians to ASK their patients about tobacco use, then ACT to help them quit. This resource can be found at: http://www.aafp.org/patient-care/public-health/tobacco-nicotine.html

More Information

An expanded version of *COPD and Asthma: Differential Diagnosis* is available at aafp.org/asthma-COPD. The expanded version contains more in-depth information on diagnostic methods and tools for screening, along with citations and full references.

A printable handout about how to use a metered dose inhaler for asthma can be found at: http://familydoctor.org/familydoctor/en/diseases-conditions/asthma/treatment/how-to-use-a-metered-dose-inhaler.html.

Patient resources on COPD treatment, starting with "stop smoking," can be found at: http://familydoctor.org/familydoctor/en/diseases-conditions/chronic-obstructive-pulmonary-disease/treatment.html.

A written asthma action plan can help patients recognize and appropriately address worsening symptoms. For more information on asthma action plans, including a downloadable plan, can be found at: http://familydoctor.org/familydoctor/en/diseases-conditions/asthma/treatment/asthma-action-plan.html.

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