

Differential diagnosis

The onset of COPD is insidious. Pathological changes may begin years before symptoms appear. The major differential diagnosis is asthma, and in some cases, a clear distinction between COPD and asthma is not possible. Other potential diagnoses are easier to distinguish from COPD^{1,2}:

Diagnosis	Suggested Features
COPD	<ul style="list-style-type: none"> • Onset in mid-life • Symptoms slowly progressive • Long history of tobacco smoking • Dyspnea during exercise • Partially reversible airflow limitation • Exposure to other risk factors such as secondhand tobacco smoke, occupational dusts and chemicals, or indoor air pollution
Asthma	<ul style="list-style-type: none"> • Onset early in life (often childhood) • Symptoms vary from day to day • Symptoms at night/early morning • Allergy, rhinitis, and/or eczema also present • Family history of asthma • Largely reversible airflow limitation
Congestive heart failure	<ul style="list-style-type: none"> • Fine basilar crackles on auscultation • Chest X-ray shows dilated heart, pulmonary edema • Pulmonary function tests indicate volume restriction, not airflow limitation
Bronchiectasis	<ul style="list-style-type: none"> • Large volumes of purulent sputum • Commonly associated with bacterial infection • Coarse crackles on auscultation, and clubbing found at physical examination • Chest X-ray/CT shows bronchial dilation, bronchial wall thickening
Tuberculosis	<ul style="list-style-type: none"> • Onset all ages • Chest X-ray shows lung infiltrate • Microbiological confirmation • High local prevalence of tuberculosis
Obliterative bronchiolitis	<ul style="list-style-type: none"> • Onset in younger age, nonsmokers • May have history of rheumatoid arthritis or fume exposure • Expiratory CT shows hypodense areas
Diffuse panbronchiolitis	<ul style="list-style-type: none"> • Most patients are male and nonsmokers • Almost all have chronic sinusitis • Chest X-ray and HRCT show diffuse small centrilobular nodular opacities and hyperinflation

These features tend to be characteristic of the respective diseases but do not occur in every case. For example, a person who has never smoked may develop COPD; asthma may develop in adult and even elderly patients.²

CT = computed tomography; HRCT = high-resolution computed tomography.

References

1. Celli BR, MacNee W; ATS/ERS Task Force. Standards for the diagnosis and treatment of patients with COPD: a summary of the ATS/ERS position paper. *Eur Respir J.* 2004;23(6):932-946; 2. The Global Initiative for Chronic Obstructive Lung Disease (GOLD). *GOLD Report—Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease.* Updated 2009. <http://www.goldcopd.com>. Accessed October 26, 2010; 3. Doherty DE. The pathophysiology of airway obstruction. *Am J Med.* 2004;117(suppl 12A):11S-23S; 4. Barnes PJ. Chronic obstructive pulmonary disease. *N Engl J Med.* 2000;343(4):269-280; 5. The Global Initiative for Asthma (GINA). *GINA Report, Global Strategy for Asthma Management and Prevention.* Updated 2009. <http://www.ginasthma.com>. Accessed December 14, 2010.

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Managing Chronic Obstructive Pulmonary Disease (COPD)

Differential Diagnosis of COPD



First considerations

Diagnostic	COPD	Asthma
Age of onset	Usually in mid-life ^{1,2}	Any age (often in childhood) ^{1,2}
Smoking history	Long smoking history ²	Nonsmokers affected ³
Usual etiology	Smoking history ² Occupational/environmental exposures ² Low birth weight in the presence of viral infections ² History of severe childhood respiratory infections ²	Immunological stimuli; family history of asthma ²
Clinical features	Persistent or worsening dyspnea; initially with exertion, eventually at rest ² Cough may be intermittent, but later is present every day, often throughout the day, and may be unproductive ²	Symptoms vary ³
Predominant inflammatory cell	Neutrophils ²	Eosinophils ²
Airflow limitation	Partially reversible ²	Largely reversible ²
Steroid response in stable disease	Little or no effect on inflammation ⁴	Inhibits inflammation ⁵

While the primary risk factor for COPD is smoking tobacco, other significant risk factors include passive exposure to tobacco smoke, occupational chemicals/dusts, and indoor air pollution (such as from cooking and heating in poorly ventilated dwellings).²

Diagnostic and classification tests

Spirometry and disease classifications

Spirometry measures airflow limitation and is necessary to confirm a diagnosis of COPD. Postbronchodilator spirometry confirms the partially reversible component of airflow limitation in patients with COPD.²

The postbronchodilator spirometric values and disease classifications for COPD and asthma are:

COPD Disease Classifications ²		
Severity	FEV ₁ /FVC	FEV ₁ % Predicted
Mild	<0.7	≥80
Moderate	<0.7	50 ≤FEV ₁ <80
Severe	<0.7	30 ≤FEV ₁ <50
Very severe	<0.7	<30 or <50 with chronic respiratory failure

Asthma Disease Classifications ⁵			
Characteristic	Controlled (all of the following)	Partly Controlled (any measure present in any week)	Uncontrolled
Daytime symptoms	Twice or less/week	More than twice/week	3 or more features of partly controlled asthma present in any week [†]
Limitations of activities	None	Any	
Nocturnal symptoms/awakening	None	Any	
Need for reliever/rescue treatment	Twice or less/week	More than twice/week	
Lung function (PEF or FEV ₁)*	Normal	<80% predicted or personal best (if known)	

*Lung function testing is not reliable for children 5 years and younger.

†Any exacerbation should prompt review of maintenance treatment to ensure that it is adequate. By definition, an exacerbation in any week makes that an uncontrolled asthma week.

FEV₁ = the volume of air exhaled in 1 second.

FVC = forced vital capacity; the volume of air that can be exhaled.

PEF = peak expiratory flow.

% predicted = values corrected for age, sex, ethnicity, and height.

Physical examination

Though important to patient care, physical examinations rarely diagnose COPD. This is because the physical signs of airflow limitation are usually not present until significant lung impairment has occurred. Some physical signs may be evident in patients with COPD, but an absence of these signs does not exclude a COPD diagnosis. Physical signs may range from relatively normal to those indicative of more advanced COPD, and can include²:

- Increased chest anterior-posterior diameter (indicative of hyperinflation)
- Recession of the lower ribs on inspiration
- Increased resting respiratory rate (20+ breaths per minute) and shallow breathing
- Pursed-lip breathing
- Reduced breath sounds and/or wheezing on auscultation, although this alone is not sufficient for a COPD diagnosis
- Central cyanosis (indicative of hypoxia) may be present but is difficult to detect

Chest radiography

Although rarely diagnostic of COPD, chest radiography can be useful in differential diagnosis and may be obtained on all patients. It is helpful in excluding other diseases and establishing the presence of significant comorbidities such as cardiac failure.² A flattened diaphragm on the lateral chest film and an increase in the volume of the retrosternal air space is a sign of hyperinflation in COPD.²