Interpreting Spirometry Results: Diagnosis and Staging of COPD

Spirometry is essential for confirming a clinical diagnosis of COPD, and provides a useful description of the severity of the disease in addition to monitoring the progression of the disease over time.[1] Spirometry measures the maximal volume of air forcibly exhaled from the point of maximal inhalation (forced vital capacity, or FVC) and the volume of air exhaled during the first second of this maneuver (forced expiratory volume in 1 second, or FEV_1). The presence of a postbronchodilator FEV_1/FVC ratio <70%, consistent with airflow limitation that is not fully reversible, confirms the diagnosis of COPD.[1] For in-office classification of COPD severity, practitioners can use postbronchodilator FEV_1 spirometry values expressed as a percentage of the predicted normal range for the individual.

Patient Name: _____ Patient Results: FEV_1/FVC: _____ FEV_1 % predicted: _____

Stage (circle one): Mild Moderate Severe Very severe

COPD Disease Classifications[1,*]

Severity	FEV_1/FVC	FEV_1 % predicted
Mild COPD	<0.70	≥80%
Moderate COPD	<0.70	50%≤FEV_1<80%
Severe COPD	<0.70	30%≤FEV_1<50%
Very Severe COPD	<0.70	<30% or <50% with chronic respiratory failure

*Based on postbronchodilator spirometry.
% predicted = values corrected for age, sex, ethnicity, and height.
Adapted from Global Initiative for Chronic Obstructive Lung Disease (GOLD).[1]

COPD Stage	Postbronchodilator FEV_1	Short-Acting Bronchodilators	Long-Acting Bronchodilators	Inhaled Glucocorticosteroids
I Mild	FEV_1≥80% predicted	✓		
II Moderate	50%≤FEV_1<80% predicted	✓	✓	
III Severe	30%≤FEV_1<50% predicted	✓	✓	✓
IV Very Severe	FEV_1<30% predicted or FEV_1<50% predicted plus chronic respiratory failure	✓	✓	✓

COPD definition includes FEV_1/FVC <0.7 and postbronchodilator FEV_1 values as described in the table above.

- Bronchodilators are central to COPD symptom management
- Inhaled bronchodilators are preferred
- Long-acting inhaled bronchodilators are more effective and convenient than short-acting agents
- The effects of inhaled glucocorticosteroids in COPD are much less dramatic than in asthma, and their role in the management of stable COPD is limited to specific indications. The addition of regular treatment with inhaled glucocorticosteroids to bronchodilator treatment is appropriate for symptomatic COPD patients with an FEV_1<50% predicted (Stage III: Severe COPD and Stage IV: Very Severe COPD) and repeated exacerbations

COPD

- Onset occurs in mid-life
- Symptoms are slowly progressive
- Long history of tobacco smoking
- Difficulty breathing during exercise
- Partially reversible airflow limitation

Asthma

- 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

The major differential diagnosis for COPD is asthma. Although a clear distinction between the two is not always possible, a careful history combined with postbronchodilator spirometry demonstrating the partially reversible airway obstruction characteristic of COPD can help clarify the diagnosis.[1,2]

Reference List:

1. Global Initiative for Chronic Obstructive Lung Disease. *Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease*. Updated 2010. http://www.goldcopd.com.

2. American Thoracic Society/European Respiratory Society Task Force. Standards for the diagnosis and management of patients with COPD. Version 1.2; 2004 (updated September 8, 2005). http://www.thoracic.org/clinical/copd-guidelines/index.php. Accessed August 3, 2010.

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