



Global Strategy for the Diagnosis, Management and Prevention of COPD
2016

Clinical Practice Guideline

MedStar Health

“These guidelines are provided to assist physicians and other clinicians in making decisions regarding the care of their patients. They are not a substitute for individual judgment brought to each clinical situation by the patient’s primary care provider-in collaboration with the patient. As with all clinical reference resources, they reflect the best understanding of the science of medicine at the time of publication, but should be used with the clear understanding that continued research may result in new knowledge and recommendations”.

The MedStar Health Ambulatory Best Practices Committee endorses and accepts the recommendations for care in *Global Strategy for the Diagnosis, Management and Prevention of COPD*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2016. A complete copy of the document can be downloaded for personal use at: <http://www.goldcopd.org/guidelines-global-strategy-for-diagnosis-management.html>.

Below are the Key Points and key tables for each chapter of the GOLD guideline and are used with permission of the Global Initiative for Chronic Obstructive Lung Disease. The reader is referred to the complete document for expanded information and the references behind the key points.

KEY POINTS: Chapter 1: Definition and Overview

- *Chronic Obstructive Pulmonary Disease (COPD), a common preventable and treatable disease, is characterized by persistent airflow limitation that is usually progressive and associated with an enhanced chronic inflammatory response in the airways and the lung to noxious particles or gases. Exacerbations and comorbidities contribute to the overall severity in individual patients.*
- COPD is a leading cause of morbidity and mortality worldwide and results in an economic and social burden that is both substantial and increasing.
- Inhaled cigarette smoke and other noxious particles such as smoke from biomass fuels cause lung inflammation, a normal response that appears to be modified in patients who develop COPD. This chronic inflammatory response may induce parenchymal tissue destruction (resulting in emphysema), and disrupt normal repair and defense mechanisms (resulting in small airway fibrosis). These pathological changes lead to air trapping and progressive airflow limitation, and in turn to breathlessness and other characteristic symptoms of COPD.

1

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KEY POINTS: Chapter 2: Diagnosis and Assessment

- A clinical diagnosis of COPD should be considered in any patient who has dyspnea, chronic cough or sputum production, and a history of exposure to risk factors for the disease.
- Spirometry is required to make the diagnosis in this clinical context; the presence of a post-bronchodilator $FEV_1/FVC < 0.70$ confirms the presence of persistent airflow limitation and thus of COPD.
- The goals of COPD assessment are to determine the severity of the disease, including the severity of airflow limitation, the impact on the patient's health status, and the risk of future events (such as exacerbations, hospital admissions, or death), in order to guide therapy.

Table 2.5. Classification of Severity of Airflow Limitation in COPD (Based on Post-Bronchodilator FEV_1)		
In patients with $FEV_1/FVC < 0.70$:		
GOLD 1:	Mild	$FEV_1 \geq 80\%$ predicted
GOLD 2:	Moderate	$50\% \leq FEV_1 < 80\%$ predicted
GOLD 3:	Severe	$30\% \leq FEV_1 < 50\%$ predicted
GOLD 4:	Very Severe	$FEV_1 < 30\%$ predicted

- Comorbidities occur frequently in COPD patients, including cardiovascular disease, skeletal muscle dysfunction, metabolic syndrome, osteoporosis, depression, and lung cancer. Given that they can occur in patients with mild, moderate and severe airflow limitation and influence mortality and hospitalizations independently, comorbidities should be actively looked for, and treated appropriately if present.
- Non-surgical bronchoscopic lung volume reduction techniques should not be used outside clinical trials until more data are available.

KEY POINTS: Chapter 3: Therapeutic Options

- In patients who smoke, smoking cessation is very important. Pharmacotherapy and nicotine replacement reliably increase long-term smoking abstinence rates.
- Appropriate pharmacologic therapy can reduce COPD symptoms, reduce the frequency and severity of exacerbations, and improve health status and exercise tolerance.

2

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Table 3.4. Bronchodilators in Stable COPD
<ul style="list-style-type: none"> • Bronchodilator medications are central to symptom management in COPD
<ul style="list-style-type: none"> • Inhaled therapy is preferred.
<ul style="list-style-type: none"> • The choice between beta2-agonist, anticholinergic, theophylline, or combination therapy depends on availability and individual patient response in terms of symptoms relief and side effects
<ul style="list-style-type: none"> • Bronchodilators are prescribed on an as-needed or on a regular basis to prevent or reduce symptoms
<ul style="list-style-type: none"> • Long-acting inhaled bronchodilators are convenient and more effective at producing maintained symptom relief than short-acting bronchodilators.
<ul style="list-style-type: none"> • Combining bronchodilators of different pharmacological classes may improve efficacy and decrease the risk of side effects compared to increasing the dose of a single bronchodilator.

- To date, none of the existing medications for COPD has been shown conclusively to modify the long-term decline in lung function.
- Each pharmacological treatment regimen needs to be patient-specific, guided by severity of symptoms, risk of exacerbations, drug availability, and the patient's response.
- Influenza and pneumococcal vaccination should be offered to every COPD patient; they appear to be more effective in older patients and those with more severe disease or cardiac comorbidity.
- All patients who get short of breath when walking on their own pace on level ground should be offered rehabilitation; it can improve symptoms, quality of life, and physical and emotional participation in everyday activities.
- Non-surgical bronchoscopic lung volume reduction techniques should not be used outside

KEY POINTS: Chapter 4: Management of Stable COPD

- Identification and reduction of exposure to risk factors are important steps in the prevention and treatment of COPD. All individuals who smoke should be encouraged to quit.
- The level of FEV₁ is an inadequate descriptor of the impact of the disease on patients and for this reason individualized assessment of symptoms and future risk of exacerbation should also be incorporated into the management strategy for stable COPD.

3

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Table 4.2. Model of Symptom/Risk of Evaluation of COPD					
<i>When assessing risk, choose the highest risk according to GOLD grade or exacerbation history. (One or more hospitalizations for COPD exacerbations should be considered high risk.)</i>					
Risk (GOLD classification of airflow limitation)	4	(C)	(D)	Risk (exacerbation history)	≥ 2 or ≥ 1 leading to hospital admission
	3				1 (not leading to hospital admission)
	2	(A)	(B)		0
	1				
		CAT <10	CAT ≥ 10		
		Symptoms			
		mMRC 0–1	mMRC ≥ 2		
		Breathlessness			
Patient category	Characteristics	Spirometric classification	Exacerbations per year	CAT	mMRC
A	Low risk, less symptoms	GOLD 1–2	≤ 1	<10	0–1
B	Low risk, more symptoms	GOLD 1–2	≤ 1	≥ 10	≥ 2
C	High risk, less symptoms	GOLD 3–4	≥ 2	<10	0–1
D	High risk, more symptoms	GOLD 3–4	≥ 2	≥ 10	≥ 2

- Pharmacologic therapy is used to reduce symptoms, reduce frequency and severity of exacerbations, and improve health status and exercise tolerance. Existing medications for COPD have not been conclusively shown to modify the long-term decline in lung function that is the hallmark of this disease.
- For both beta₂-agonists and anticholinergics, long acting formulations are preferred over short-acting formulations. Based on efficacy and side effects, inhaled bronchodilators are preferred over oral bronchodilators.
- Long-term treatment with inhaled corticosteroids added to long-acting bronchodilators is recommended for patients at high risk of exacerbations.
- Long-term monotherapy with oral or inhaled corticosteroids is not recommended in COPD.
- The phosphodiesterase-4 inhibitor roflumilast may be useful to reduce exacerbations for patients with FEV₁ < 50% predicted, chronic bronchitis, and frequent exacerbations.

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Table 4.4. Initial Pharmacologic Management of COPD*			
Patient Group	Recommended First Choice	Alternative Choice	Other Possible Treatments**
A	Short-acting anticholinergic prn <i>or</i> Short-acting beta ₂ -agonist prn	Long-acting anticholinergic <i>or</i> Long-acting beta ₂ -agonist <i>or</i> Short-acting beta ₂ -agonist and short-acting anticholinergic	Theophylline
B	Long-acting anticholinergic <i>or</i> Long-acting beta ₂ -agonist	Long-acting anticholinergic and long-acting beta ₂ -agonist	Short-acting beta ₂ -agonist <i>and/or</i> Short-acting anticholinergic Theophylline
C	Inhaled corticosteroid + long-acting beta ₂ -agonist <i>or</i> Long-acting anticholinergic	Long-acting anticholinergic and long-acting beta ₂ -agonist <i>or</i> Long-acting anticholinergic and phosphodiesterase-4 inhibitor <i>or</i> Long-acting beta ₂ -agonist and phosphodiesterase-4 inhibitor	Short-acting beta ₂ -agonist <i>and/or</i> Short-acting anticholinergic Theophylline
D	Inhaled corticosteroid + long-acting beta ₂ -agonist <i>and/or</i> Long-acting anticholinergic	Inhaled corticosteroid + long-acting beta ₂ -agonist and long-acting anticholinergic <i>or</i> Inhaled corticosteroid + long-acting beta ₂ -agonist and phosphodiesterase-4 inhibitor <i>or</i> Long-acting anticholinergic and long-acting beta ₂ -agonist <i>or</i> Long-acting anticholinergic and phosphodiesterase-4 inhibitor	Carbocysteine N-acetylcysteine Short-acting beta ₂ -agonist <i>and/or</i> Short-acting anticholinergic Theophylline

*Medications in each box are mentioned in alphabetical order, and therefore not necessarily in order of preference.

**Medications in this column can be used alone or in combination with other options in the Recommended First Choice and Alternative Choice columns

- Influenza vaccines can reduce the risk of serious illness (such as hospitalization due to lower respiratory tract infections) and death in COPD patients.

- Currently, the use of antibiotics is not indicated in COPD, other than for treating infectious exacerbations of COPD and other bacterial infections.

- All COPD patients with breathlessness when walking at their own pace on level ground appear to benefit from rehabilitation and maintenance of physical activity, improving their exercise tolerance and quality of life, and reducing symptoms of dyspnea and fatigue.

Routine follow-up is essential in COPD. Lung function can be expected to worsen over time, even with the best available care. Symptoms and objective measures of airflow limitation should be monitored to

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determine when to modify therapy and to identify any complications that may develop. As at the initial assessment, follow-up visits should include a discussion of symptoms, particularly any new or worsening symptoms, and a physical examination. Comprehensive self-management or routine monitoring does not appear to show long term benefits in terms of quality of life or self efficacy over usual care alone in COPD patients in general practice. Decline in lung function is best tracked by spirometry performed at least once a year to identify patients whose lung function is declining quickly. Questionnaires such as the COPD Assessment Test (CAT) can be performed every two to three months; trends and changes are more valuable than single measurements. Monitor medication adherence and efficacy. Monitor exacerbation history as it is a strong predictor of subsequent exacerbations

KEY POINTS: Chapter 5: Management of Exacerbations

- An exacerbation of COPD is an acute event characterized by a worsening of the patient's respiratory symptoms that is beyond normal day-to-day variations and leads to a change in medication.
- Exacerbations of COPD can be precipitated by several factors. The most common causes appear to be viral upper respiratory tract infections and infection of the tracheobronchial tree.
- The diagnosis of an exacerbation relies exclusively on the clinical presentation of the patient complaining of an acute change of symptoms (baseline dyspnea, cough, and/or sputum production) that is beyond normal day-to-day variation.

Table 5.2. Assessment of COPD Exacerbations: Signs of Severity
<ul style="list-style-type: none"> • Use of accessory respiratory muscles • Paradoxical chest wall movements • Worsening or new onset central cyanosis • Development of peripheral edema • Hemodynamic instability • Deteriorated mental status

- The goal of treatment in COPD exacerbations is to minimize the impact of the current exacerbation and to prevent the development of subsequent exacerbations.
- Short-acting inhaled beta₂-agonists with or without short-acting anticholinergics are usually the preferred bronchodilators for treatment of an exacerbation.
- Systemic corticosteroids and antibiotics can shorten recovery time, improve lung function (FEV₁) and arterial hypoxemia (PaO₂), and reduce the risk of early relapse, treatment failure, and length of hospital stay.

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Table 5.3. Potential Indications for Hospital Assessment or Admission*

- Marked increase in intensity of symptoms, such as sudden development of resting dyspnea
- Severe underlying COPD
- Onset of new physical signs (e.g., cyanosis, peripheral edema)
- Failure of an exacerbation to respond to initial medical management
- Presence of serious comorbidities (e.g., heart failure or newly occurring arrhythmias)
- Frequent exacerbations
- Older age
- Insufficient home support

Table 5.4. Management of Severe but Not Life-Threatening Exacerbations*

- Assess severity of symptoms, blood gases, chest radiograph
- Administer supplemental oxygen therapy and obtain serial arterial blood gas measurement
- Bronchodilators:
 - Increase doses and/or frequency of short-acting bronchodilators
 - Combine short-acting beta₂-agonists and anticholinergics
 - Use spacers or air-driven nebulizers
- Add oral or intravenous corticosteroids
- Consider antibiotics (oral or occasionally intravenous) when signs of bacterial infection
- Consider noninvasive mechanical ventilation
- At all times:
 - Monitor fluid balance and nutrition
 - Consider subcutaneous heparin or low molecular weight heparin
 - Identify and treat associated conditions (e.g., heart failure, arrhythmias)
 - Closely monitor condition of the patient

• COPD exacerbations can often be prevented. Smoking cessation, influenza and pneumococcal vaccination, knowledge of current therapy including inhaler technique, and treatment with long acting inhaled bronchodilators, with or without inhaled corticosteroids, and treatment with a phosphodiesterase-4 inhibitor are all interventions that reduce the number of exacerbations and hospitalizations.

KEY POINTS: Chapter 6: COPD and Comorbidities

- COPD often coexists with other diseases (comorbidities) that may have a significant impact on prognosis.
- In general, the presence of comorbidities should not alter COPD treatment and comorbidities should be treated as if the patient did not have COPD.

7

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- Cardiovascular disease is a major comorbidity in COPD and probably both the most frequent and most important disease coexisting with COPD.
- Osteoporosis and depression are also major comorbidities in COPD, are often under-diagnosed, and are associated with poor health status and prognosis.
- Lung cancer is frequently seen in patients with COPD and has been found to be the most frequent cause of death in patients with mild COPD.
- Gastroesophageal reflux (GERD) is associated with an increased risk of exacerbations and poorer health status.

Please reference this document as follows:

From the *Global Strategy for the Diagnosis, Management and Prevention of COPD*, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2016. Available from:
<http://www.goldcopd.org/>.

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