

Adult Chronic Obstructive Pulmonary Disease (COPD) Practice Guideline

Patient presents with respiratory signs/symptoms consistent with COPD

Symptoms include dyspnea on exertion, chronic cough or sputum production, and/or history of disease risk factors (e.g. smoking) (**TABLE A**)



Diagnosis requires testing and assessment (TABLE B) including spirometry with a post bronchodilator FEV1/FVC < 0.70 (actual). Goals of assessment are to determine disease severity, impact on patient's life, and risk of future events.

Assess the following to guide therapy:

- Symptoms:
 - Use COPD Assessment Test (CAT) (**Appendix A**) preferred or mMRC (**TABLE C**); optimal CAT number is < 10
 - Increase in CAT # of 2 or more from baseline may require intervention
- Degree of airflow limitation using spirometry (**TABLE D**)
- Risk of exacerbations (≥ 2 treated events/year indicates higher risk)
- Comorbidities: cardiovascular disease, osteoporosis, depression/anxiety, skeletal muscle dysfunction, metabolic syndrome, lung cancer, obstructive sleep apnea (OSA), etc., may influence mortality and hospitalizations
- Alpha-1 antitrypsin screening for all newly diagnosed patients and established ones at risk (**Table A**)



Manage stable COPD based on GOLD combined assessment (TABLE E). Patient education and self-management techniques are important aspects of care. Consider consultation with pulmonologist in GOLD spirometry stage II-IV.

Effective management should be aimed at:

- Reducing symptoms
 - Pharmacologic therapy (**TABLE F**)
 - Other respiratory treatments as indicated i.e. airway clearance and/or home oxygen (**TABLE G**). Perform oximetry at rest with every visit. Do activity oximetry if having exertional dyspnea.
 - Regular exercise; consider outpatient pulmonary rehab for GOLD Spirometry Severity Stage II-IV
 - Optimal nutrition
 - Palliative care/advanced directives/end of life discussions should be considered in GOLD Patient Groups C and D
- Reducing risk
 - Prevent disease progression through smoking cessation/irritant avoidance
 - Prevent exacerbations: yearly influenza vaccination, Pneumovax for > 64 year olds or FEV1 < 40% (booster after 5-7 years)
 - Treat exacerbations early: written COPD Home Management of Care Plan (**Appendix B**)



Reassess: Follow up in 1-3 months after initial diagnosis or treatment

- Rate symptoms (CAT) and make adjustments in treatment plan based on need to reduce symptoms and/or reduce risk
- Review and update Home Management Plan of Care (including inhaled medication technique, home oxygen needs, airways clearance techniques, smoking cessation/irritant avoidance, and exercise) at every visit



- Follow up at 6 month intervals with spirometry yearly and other testing as indicated (**TABLE B**). As disease progresses, visits may become more frequent.
- Update Home Management Plan of Care yearly and as needed
- Rate symptoms and rest oximetry at every visit
- Osteoporosis evaluation if on chronic oral steroids
- Hematocrit if suspect chronic hypoxemia

Yes



Is patient stable?
Is CAT score stable?

No



- Treat exacerbations with Home Management Plan of Care and/or outpatient intervention as needed (**TABLE H**)
- Reassess medication adherence/needs
- Evaluate inhaled medication technique (**TABLE I**) and/or airway clearance needs and home oxygen needs every visit or as indicated
- Check adherence to environmental control and smoking cessation
- Investigate other possible precipitating factors/co-morbid conditions (e.g. other lung diseases, allergens, GERD, sinus infection, Beta-blocker use, CHF, malignancy, heart disease, sleep apnea, etc.)
- Consider consultation with pulmonologist in Stage II-IV as indicated
- Consider palliative care

TABLE A: Risk Factors

- Tobacco smoke
- Occupational dusts and chemicals (vapors, irritants, fumes)
- Indoor air pollution: biomass fuel used for cooking & heating in poorly vented dwellings
- Genetic: Alpha-1 antitrypsin deficiency (consider esp. in non-smokers and/or early onset)

TABLE B: Testing and Assessment

- Spirometry: initial, yearly, and as needed
- Lung volumes and diffusion: optional studies to document hyperinflation and symptoms that are out of proportion to spirometry results
- Oximetry: each visit (minimum annually), with exercise for exertional dyspnea, with sleep as needed
- Chest X-ray: as indicated; baseline
- CAT (impact on life): each visit
- Arterial Blood Gas (ABG): FEV1 < 50%, signs of right heart failure, or chronic respiratory failure
- Alpha-1 antitrypsin screening: early onset diagnosis; if positive, consider replacement therapy and/or genetic counseling

**TABLE C: Medical Research Council Dyspnea (MRC) Scale
(Assesses Functional Dyspnea)**

- 0 Not troubled with breathlessness except with strenuous exercise
- 1 Troubled by shortness of breath when hurrying or walking up a slight hill
- 2 Walks slower than people of the same age due to breathlessness or has to stop for breath when walking at own pace on the level
- 3 Stops for breath after walking ~100 m or after a few minutes on the level
- 4 Too breathless to leave the house or breathless when dressing or undressing

**TABLE D: G.O.L.D. Severity Stage of Airflow Limitation in COPD Based on Post-Bronchodilator FEV1
Patients must have an actual FEV1/FVC < 0.70**

GOLD 1	Mild	FEV1 ≥ 80% predicted
GOLD 2	Moderate	FEV1 50-79% predicted
GOLD 3	Severe	FEV1 30-49% predicted
GOLD 4	Very Severe	FEV1 < 30% predicted or FEV1 < 50% predicted plus chronic respiratory failure

TABLE E: Combined Assessment of COPD – Spirometer + Exacerbations/year + Symptoms

Patient A	Low Risk (Gold 1-2, ≤ 1 exacerbations/year), Less symptoms (MRC 0-1 or CAT < 10)
Patient B	Low Risk (Gold 1-2, ≤ 1 exacerbations/year), More symptoms (MRC ≥ 2 or CAT ≥ 10)
Patient C	High Risk (GOLD 3-4, ≥ 2 exacerbations/year), Less Symptoms (MRC 0-1 or CAT < 10)
Patient D	High Risk (GOLD 3-4, ≥ 2 exacerbations/year), More symptoms (MRC ≥ 2 or CAT ≥ 10)

TABLE F: Pharmacologic Therapy for Stable COPD (listed alphabetically)

Patient Group	Recommended First Choice	Alternate Choice	Other possible treatments used alone or in combo from First or Alternate Choices
Patient A: Low Risk; Less Symptoms			
<ul style="list-style-type: none"> GOLD spiro 1-2 (FEV1 $\geq 50\%$) < 2 flares/yr mMRC 0-1 or CAT < 10 	SAMA prn OR SABA prn	LAMA OR LABA OR SABA AND SAMA	Theophylline
Patient B: Low Risk; More Symptoms			
<ul style="list-style-type: none"> GOLD spiro 1-2 (FEV1 $\geq 50\%$) < 2 flares/yr mMRC > 1 or CAT > 9 	LAMA OR LABA	LAMA AND LABA	SABA AND/OR SAMA Theophylline
Patient C: High Risk; Less Symptoms			
<ul style="list-style-type: none"> GOLD spiro 3-4 (FEV1 $\leq 49\%$) > 1 flares/yr mMRC 0-1 or CAT < 10 	ICS + LABA OR LAMA	LAMA and LABA OR LAMA and PDE-4 inhibitor OR LABA AND PDE-4 Inhibitor	SABA AND/OR SAMA Theophylline
Patient D: High Risk; More Symptoms			
<ul style="list-style-type: none"> GOLD spiro 3-4 (FEV1 $\leq 49\%$) > 1 flares/yr mMRC > 1 or CAT > 9 	ICS + LABA AND/OR LAMA	ICS + LABA AND LAMA OR ICS + LABA AND PDE-4 inhibitor OR LAMA AND LABA OR LAMA AND PDE-4 inhibitor	Carbocysteine SABA AND/OR SAMA Theophylline

Drug Abbreviation Key:

SABA: Short Acting Beta Agonist
 LABA: Long Acting Beta Agonist
 ICS: Inhaled Corticosteroid
 PDE-4: Phosphodiesterase-4

SAMA: Short Acting Muscarinic Antagonist
 LAMA: Long Acting Muscarinic Antagonist

TABLE G: Oxygen Therapy

<ul style="list-style-type: none"> Initiate if PaO₂ ≤ 55 or SaO₂ $\leq 88\%$ or for patients whose arterial PO₂ is 56-59 mm Hg or whose arterial blood oxygen saturation is 89%, if there is evidence of: <ul style="list-style-type: none"> Dependent edema suggesting congestive heart failure Pulmonary hypertension or cor pulmonale determined by measurement of pulmonary artery pressure, gated blood pool scan Echocardiogram or "P" pulmonale on EKG (P wave greater than 3 mm in standard leads II, III, or AVFL) Erythrocythemia with a hematocrit greater than 55 percent Recheck ABG's or oximetry after 30-90 days if oxygen was started during an exacerbation to document continued need Select home system to match patient's needs and not hinder ambulation If does not qualify for oxygen at rest, consider testing with sleep and activity

REFERENCE INFORMATION

TABLE H: Inhaled Medications

Nebulizer vs. Inhaler

Document: Has patient tried and failed on inhaler due to technique or patient response?

- If yes, consider use of nebulizer holding chamber with MDI. Document rationale.
- If inspiratory flow rate too low, avoid dry powder inhalers

TABLE I: Outpatient Management of Exacerbations

Bronchodilators: Increase dose and/or frequency of existing short-acting bronchodilator therapy, preferably with β_2 -agonists. If not already used, add anticholinergics until symptoms improve.

Glucocorticosteroids: If baseline FEV1 < 50% predicted, add 30-40 mg oral prednisolone per day for 5-10 days to the bronchodilator regimen. Nebulized budesonide may be an alternative to oral glucocorticosteroids in treatment of nonacidotic exacerbations.

Antibiotics: start with increased sputum purulence and/or increased dyspnea and/or increased sputum volume.

Indications for hospital admission: marked increase in intensity of symptoms (sudden resting dyspnea), severe background of COPD, onset of new physical signs (cyanosis, peripheral edema), failure to respond to initial medical management, significant comorbidities, frequent exacerbations, newly occurring arrhythmias, diagnostic uncertainty, older age, insufficient home support.

Clinical Pearls

- The optimal care of the COPD patient requires an individualized, integrated and collaborative approach to address all aspects of the disease
- Spirometry is needed to diagnosis COPD
- Assessment of symptoms, exacerbations, and yearly spirometry help guide treatment
- LABA or LAMA inhaled medications are preferred over SABA for daily use
- Smoking cessation is a key therapeutic intervention
- Recommend influenza and pneumococcal vaccinations
- Routine use of antibiotics typically are not indicated in stable COPD except for treating infectious exacerbations
- Offer pulmonary rehab if have patient has dyspnea on exertion
- Make sure inhaled medication techniques are correct and hypoxemia is treated
- Actively look for and treat comorbidities

References

1. GlaxoSmithKline. (2009). COPD Assessment Test (CAT).
2. Global Strategy for the Diagnosis, Management and Prevention of COPD, Global Initiative for Chronic Obstructive Lung Disease (GOLD) 2014. Available from: <http://www.goldcopd.org/>.

APPENDIX A: COPD Assessment Test™ (CAT)

Your name:

Today's date:



How is your COPD? Take the COPD Assessment Test™ (CAT)

This questionnaire will help you and your healthcare professional measure the impact COPD (Chronic Obstructive Pulmonary Disease) is having on your wellbeing and daily life. Your answers, and test score, can be used by you and your healthcare professional to help improve the management of your COPD and get the greatest benefit from treatment.

For each item below, place a mark (X) in the box that best describes you currently. Be sure to only select one response for each question.

Example: I am very happy (0) **(X)** (1) (2) (3) (4) (5) I am very sad

			SCORE
I never cough	(0) (1) (2) (3) (4) (5)	I cough all the time	
I have no phlegm (mucus) in my chest at all	(0) (1) (2) (3) (4) (5)	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	(0) (1) (2) (3) (4) (5)	My chest feels very tight	
When I walk up a hill or one flight of stairs I am not breathless	(0) (1) (2) (3) (4) (5)	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	(0) (1) (2) (3) (4) (5)	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	(0) (1) (2) (3) (4) (5)	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	(0) (1) (2) (3) (4) (5)	I don't sleep soundly because of my lung condition	
I have lots of energy	(0) (1) (2) (3) (4) (5)	I have no energy at all	
			TOTAL SCORE

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REFERENCE INFORMATION

APPENDIX B: COPD Home Management Plan of Care

Name *** DOB ***
 Doctor Name & phone number ***

Date of Plan ***

In control when:

Able to do usual activities
 Have usual amounts of phlegm
 Sleeping well at night
 Appetite is good

Action (every day) →

Take daily controller medicines ***
 Use oxygen as instructed: ***at rest *** with activity *** with sleep
 Use mucus clearing devices if ordered by your doctor ***
 Continue regular exercise & diet plan; get plenty of rest
 Stay away from lung irritants especially cigarette smoke (Call 1-800-QUITNOW for quit smoking help)
 Get yearly influenza shot. Keep pneumonia vaccine up-to-date.
 Consider doing an outpatient pulmonary rehabilitation program (call 605-328-1890 or local hospital)

Need relief when any of the following occur:

Having a harder time breathing than usual
 Coughing or wheezing more than usual
 Lung phlegm is thicker, darker, or more in amount
 Use of quick-relief medicine is more than usual
 Breathing is upsetting sleep and eating
 Ankles are more swollen

Action →

Use oxygen as instructed.
 Do slow controlled breathing. Exhale slowly through puckered lips.
 Use reliever inhaler or nebulizer up to every 4 hours ***
 If still needing to use more frequently than usual after 2 days, contact doctor.
 If having increased cough with changes in lung phlegm (increase amount, color change, thicker and harder to cough up), contact doctor or start antibiotic prescribed by doctor. If using a mucus clearing device, increase use to help clear mucus.
 Other: ***

Need help right away if any of these serious signs are present:

Very hard time breathing even when not moving
 Not able to do any activity
 Not able to sleep
 Fever or shaking chills
 Feeling confused or very sleepy
 Chest pains
 Coughing up blood

Action →

Take reliever inhaler or nebulizer
 Contact doctor right away (phone number) *** or
 Call 911 or go to nearest hospital
 Other ***

***wild card option – fill in or autofill in OneChart. This form has not been built in OneChart yet.

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