Chronic Obstructive Pulmonary Disease (COPD)
A VA Clinician’s Guide
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Key Messages

Evaluate all patients with symptoms and/or a history of exposure to risk factors for COPD and use spirometry to make the diagnosis. 4

Encourage all patients to quit smoking regardless of COPD severity. 6

Give all Veterans with COPD the influenza vaccine annually and pneumococcal vaccines as indicated by age. 7

Use a LAMA or LABA as initial therapy for most patients in Group A and Group B. Short-acting agents, SAMA or SABA, should only be used for immediate relief of symptoms. 10

Use LAMA as first line therapy for patients in Group C and D. Progress to combination therapy, usually LAMA + LABA, if monotherapy is not effective. 11

Treat an exacerbation with short-acting beta-agonist(s), continue long-acting bronchodilator(s), and give short courses of oral corticosteroids (5-days) and antibiotics (5–7 days) when indicated. 21
**Key Facts**

Almost 16 million Americans have been diagnosed with chronic obstructive pulmonary disease (COPD). The actual prevalence is likely much higher since many people with low pulmonary function are not aware of their condition and remain undiagnosed.\(^1\),\(^2\),\(^3\)

COPD was the 4\(^{th}\) leading cause of death in the United States in 2017 and the 2\(^{nd}\) most common cause of admission for an ambulatory care sensitive condition (ACSC) from 2018–2019.\(^4\),\(^5\)

**Figure 1. One Person Dies Every Four Minutes from Complications Related to COPD**\(^6\)

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**The Importance of COPD Exacerbations**

An acute COPD exacerbation is any worsening of a patient’s dyspnea, cough, or sputum from their baseline symptom variability.\(^7\) Acute exacerbations are significant since the risk of death increases as the number and severity of exacerbations increase.\(^7\),\(^8\)

**Figure 2. Trajectory of COPD After Experiencing Exacerbations**\(^7\),\(^8\)
Initial Assessment and Diagnosis

COPD should be considered in any patient with symptoms (e.g., chronic cough, dyspnea) or a history of exposure to risk factors.\textsuperscript{9} Airway obstruction is the hallmark of COPD, which is typically confirmed using spirometry in patients with risk factors and symptoms consistent with COPD.

Figure 3. Risk Factors for and Symptoms of COPD\textsuperscript{9–12}

<table>
<thead>
<tr>
<th>Risk Factors</th>
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<tbody>
<tr>
<td>• Smoking tobacco</td>
</tr>
<tr>
<td>• Occupational dust or fumes</td>
</tr>
<tr>
<td>• Environmental (e.g., smoke from fires)</td>
</tr>
<tr>
<td>• Genetic: alpha-1 antitrypsin deficiency (AATD)*</td>
</tr>
</tbody>
</table>

OR

<table>
<thead>
<tr>
<th>Symptoms</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Chronic cough</td>
</tr>
<tr>
<td>• Shortness of breath/dyspnea</td>
</tr>
<tr>
<td>• Frequent respiratory infections</td>
</tr>
<tr>
<td>• Fatigue</td>
</tr>
<tr>
<td>• Sputum production</td>
</tr>
<tr>
<td>• Wheezing/chest tightness</td>
</tr>
</tbody>
</table>

Spirometry Testing**

COPD is confirmed by a \( FEV_1 < 0.70 \frac{FVC}{FVC} \)

OR

If the Veteran’s results are below the Lower Limit of Normal (LLN) they have COPD.

\*Testing (serum and/or genetic) is required to diagnose AATD. Consider testing in patients < age 45 at onset of symptoms who have minimal exposure to tobacco or other environmental risk factors. **Tested after administration of bronchodilator. If FEV\(_1\)/FVC is between 0.6 to 0.8 range, repeat spirometry to confirm diagnosis. FEV\(_1\) = forced expiratory volume in one second; FVC = forced vital capacity.

Chronic inhalation of anything combustible can cause COPD. This includes cannabis and tobacco in any inhaled forms or respiratory routes of administration (e.g., pipe, cigarette, water pipe/hookah, and vaping).\textsuperscript{13,14} Eliminating exposure to tobacco smoke and reducing exposure to air pollution can prevent COPD in most individuals.\textsuperscript{7,9}

Did You Know

Evaluate all patients with symptoms and/or a history of exposure to risk factors for COPD and use spirometry to make the diagnosis.
Developing a Treatment Plan for COPD

Simply prescribing an inhaler for a patient with COPD is not a treatment plan. Treatment decisions for COPD patients should be individualized, multi-modal, and guided by symptoms, symptom severity, comorbidities, and the frequency of acute exacerbations.\(^9\) (Note: a patient’s ability to use an inhaler device and their preference should be incorporated into the treatment plan.)

**Figure 4. Elements of a COPD Treatment Plan\(^9\)**

<table>
<thead>
<tr>
<th>Smoking Cessation</th>
<th>Quitting has the greatest impact on slowing COPD progression.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaccines</td>
<td>Influenza vaccine helps reduce COPD exacerbations and hospitalizations. Pneumococcal vaccine PPSV23 reduces the rates of community-acquired pneumonia in patients with COPD.</td>
</tr>
<tr>
<td>Pharmacotherapy for COPD</td>
<td>Pharmacotherapy reduces symptoms, frequency and severity of exacerbations, and improves exercise tolerance and health status.</td>
</tr>
<tr>
<td>Non-pharmacologic Therapies</td>
<td>Proper nutrition, exercise, and use of pulmonary rehabilitation helps improve quality of life and reduce exacerbations.</td>
</tr>
<tr>
<td>Treating Other Comorbidities</td>
<td>The most common cause of death in Veterans with COPD is cardiovascular disease. Addressing this, along with other common comorbidities, like depression, lung cancer, obesity, and osteoporosis, is vital to the overall health of patients with COPD.</td>
</tr>
</tbody>
</table>

**Smoking Cessation**

Ask every patient with COPD if they smoke tobacco. If they do, smoking cessation should be addressed. Smoking cessation improves survival in patients with COPD, including older patients.\(^15\) Veterans who say they are ready to quit in the next 30 days should receive pharmacotherapy support (e.g., nicotine replacement, bupropion, or varenicline).\(^16\)
Figure 5. Pathway for Addressing Tobacco Use – The 5 A’s

- **Ask — About Tobacco Use**
  - Ask about type of tobacco, how much used daily, and prior experience in quitting.

- **Advise — To Quit Now**
  - Focus on benefits of quitting for COPD and other health concerns like cardiovascular disease.

- **Assess — Is the Patient Ready to Quit**
  - Is the patient ready to quit in the next 30 days? If “Yes,” then proceed. If “No,” then encourage quitting.

- **Assist — Offer and Connect to Treatment**
  - Prescribe pharmacotherapy and offer behavioral support.*

- **Arrange — Follow Up in 1 to 2 Weeks**
  - If patient accepts treatment, follow up in 1 to 2 weeks. If patient declines treatment, continue to encourage cessation at every visit.

*Behavioral supports with evidence for benefit include individual sessions, group sessions, or provider support via telephone or Quitline (the VA National Quitline is: 1-855-QUIT-VET (1-855-784-8838). See the Academic Detailing Service (ADS) Tobacco Use Disorder Provider Guide and ADS Tobacco Use Disorder Quick Reference Guide for more detailed information on pharmacotherapy for tobacco cessation (www.pbm.va.gov).

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If the patient is not a current smoker or quits smoking, reducing exposure to secondhand smoke is essential. Encourage a no smoking policy for home, car and work settings to reduce exposure to secondhand smoke and prevent relapse.

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Encourage all patients to quit smoking regardless of COPD severity.
Annual influenza vaccination can significantly reduce the incidence of lower respiratory infections and death in people with COPD. The pneumococcal vaccine PPSV23 (23-valent) reduces the incidence of community-acquired pneumonia in COPD patients under 65 with an FEV <40% and in those with comorbidities. Pneumococcal vaccines (13- or 23-valent), are recommended for all patients 65 years and older.

Figure 6. Vaccine Timing for Adults with COPD

*If received PPSV23 at <65 years and patient is now ≥65 years, wait 5 years between PPSV23 vaccinations for second PPSV23 dose. **Patients who are immunocompromised or asplenic also need PVC13 one time when <65 years. PCV13: 13-valent pneumococcal conjugate vaccine (Prevnar®); PPSV23: 23-valent pneumococcal polysaccharide vaccine (Pneumovax®), Tdap: tetanus, diphtheria, pertussis vaccine; Td: tetanus and diphtheria vaccine. For specific recommendations, see the Advisory Committee on Immunization Practices (ACIP): [https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf](https://www.cdc.gov/vaccines/vpd/pneumo/downloads/pneumo-vaccine-timing.pdf).

Give all Veterans with COPD the influenza vaccine annually and pneumococcal vaccines as indicated by age.
Pharmacotherapy can reduce symptoms, decrease the risk and severity of exacerbations, and improve health status and exercise tolerance. Review the Veteran’s exacerbation history and assess his or her symptoms to guide pharmacotherapy initiation and the need for medication changes.

Determining Treatment Group (GOLD A, B, C or D)\textsuperscript{9,23–26}

The most widely used therapeutic strategy for treating COPD is from the Global Initiative for Chronic Obstructive Lung Disease (GOLD).\textsuperscript{9}

**Figure 7. ABCD Assessment Tool – GOLD Groups\textsuperscript{25,26}**

For this diagram, think of the Exacerbation History as the Y-axis and Symptoms as the X-axis.
- Groups A and C have a lower symptom burden (lower mMRC and CAT scores).
- Groups B and D have a greater symptom burden.
- Groups A and B have infrequent exacerbations.
- Groups C and D have frequent exacerbations.

To categorize a patient into a group (A–D), include both exacerbation history and symptoms. For example, if a patient has had three exacerbations in the past year and a CAT score of nine, they would be in group C.

CAT = COPD Assessment Test; mMRC = Modified Medical Research Council Breathlessness Scale; See Appendix for the full questionnaires. Exacerbation history is the number of exacerbations in the past year.
### Table 1. Initial Treatment by GOLD Group\(^9\)

<table>
<thead>
<tr>
<th>Exacerbation History</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>0 or 1 exacerbations not leading to hospital admission</td>
<td>≥2 exacerbations or ≥1 leading to hospital admission</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Assessment of Symptoms/Risk of Exacerbations</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Milder Symptoms</strong></td>
</tr>
<tr>
<td>mMRC 0–1 or CAT &lt;10</td>
</tr>
<tr>
<td><strong>Group A</strong></td>
</tr>
<tr>
<td>Bronchodilator (long-acting or short-acting)</td>
</tr>
<tr>
<td>Persistent symptoms – use a LAMA or LABA</td>
</tr>
<tr>
<td>Occasional dyspnea – use a SAMA or SABA</td>
</tr>
</tbody>
</table>

**Group C**

**Group D**

LAMA or LAMA + LABA*

**Group C**

LAMA

**Group D**

LAMA or LAMA + LABA*

Short-acting agents (SAMA or SABA) should be considered for patients on long-acting bronchodilators who need immediate relief.

*Consider starting with LAMA + LABA if patient is highly symptomatic (e.g., CAT >20). Consider starting with LABA + ICS if patient has a history of asthma or CAT score >20 and eosinophil count (eos) ≥300 cells/µL or eos ≥100 cells/µL and ≥2 moderate exacerbations or >1 hospitalization. ICS = inhaled corticosteroid; LABA = long-acting beta\(_2\) agonist; LAMA = long-acting muscarinic antagonist; SABA = short-acting beta\(_2\) agonist; SAMA = short-acting muscarinic antagonist.

Long-acting bronchodilators are preferred over short-acting agents for initial treatment in Group A patients with persistent symptoms because they improve lung function, dyspnea, and health status as well as reduce exacerbations while short-acting agents only improve dyspnea and temporarily improve lung function.\(^9,27–30\)

- First line: LAMA or LABA for persistent symptoms.
- SAMA or SABA can be considered in patients with only occasional dyspnea.
- SAMA or SABA can be added to long-acting bronchodilators in patients who need immediate relief, prescribed on an as-needed schedule.\(^9\)
In Group B patients, there is no evidence to recommend one class of long-acting bronchodilator over another for initial treatment.\textsuperscript{9}

LAMA + LABA can be used in patients whose symptoms are not controlled on monotherapy. Inhaled corticosteroids (ICS) should be reserved for patients with asthma or if symptoms are not controlled on LAMA + LABA.

Figure 8. Reduced Annual Rate of Exacerbations and Increased Time to First Exacerbation with Tiotropium (LAMA) Monotherapy Compared to Salmeterol (LABA)\textsuperscript{31}

Tiotropium Reduced Annual Rate of Exacerbations by 11\% and Severe Exacerbations by 27\% 

Tiotropium Increased the Time to First Exacerbation by 42 Days

POET-COPD trial comparing tiotropium to salmeterol in patients with moderate-to-very-severe COPD and a history of exacerbations in the previous year (p <0.05 for all comparisons in figures).
- First line: LAMA, consider LAMA + LABA if patient has more severe symptoms (e.g., CAT score >20)\textsuperscript{9,33}
  - Combination of LAMA + LABA reduced COPD exacerbations and increases the time to first exacerbation compared to LABA + ICS.\textsuperscript{33}
- Initial therapy with LABA + ICS can be considered in patients with:\textsuperscript{9}
  - A history of asthma
  - Severe symptoms and eos ≥300 cells/µL
  - Blood eos ≥100 cells/µL and ≥2 moderate exacerbations or >1 hospitalization

**Figure 9.** Combination of LAMA + LABA Reduced COPD Exacerbations and Increased the Time to First Exacerbation Compared to LABA + ICS\textsuperscript{33}

FLAME trial evaluating indacaterol-glycopyrrolate (LABA+LAMA) compared to salmeterol-fluticasone (LABA+ICS) in patients with COPD and a history of at least one exacerbation in the previous year. The trial was designed to evaluate the annual rate of all COPD exacerbations (p <0.001 for all comparisons in figure).

Use LAMA as first line therapy for patients in Group C and D. Progress to combination therapy, usually LAMA + LABA, if monotherapy is not effective.
Follow Up Assessment and Treatment of COPD

Follow up treatment is based on how the patient responded:

✓ If the patient had an adequate response to the initial treatment, then maintain it.

✗ If not, modify treatment based on whether patient is having continued dyspnea or if they are having exacerbations. If they are having both, then follow the recommendations for exacerbations.

Figure 10. Assessing Treatment Response for All GOLD Groups

Figure 11. Proper Inhaler Technique is Critical for Effective COPD Pharmacotherapy

✓ Provide instructions and demonstrate proper technique when prescribing an inhaler device.

✓ Spacers improve drug delivery when used with metered dose inhalers (MDI).

✓ Inhaler technique and adherence to therapy should be assessed before considering dose adjustments and/or changing therapy. (Links to VA Instructional Videos in the Veteran Health Library: Combivent Respimat, Pressurized Metered Dose Inhaler, HandiHaler, Mometasone Twisthaler, How to Use a Nebulizer)
### Table 2. At Follow-up Visit, Modify Treatment Based on Dyspnea and/or Exacerbations\(^9,10,34,35\)

<table>
<thead>
<tr>
<th>Dyspnea Pathway</th>
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<tbody>
<tr>
<td><strong>Initial Treatment</strong></td>
</tr>
<tr>
<td>LAMA or LABA</td>
</tr>
<tr>
<td>LABA + ICS</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Exacerbation Pathway</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Initial Treatment</strong></td>
</tr>
<tr>
<td>LAMA or LABA</td>
</tr>
<tr>
<td>LABA + ICS</td>
</tr>
<tr>
<td>• In patients with a history of asthma(^9)</td>
</tr>
<tr>
<td>LABA + ICS</td>
</tr>
<tr>
<td>LABA + ICS</td>
</tr>
</tbody>
</table>

\(^9\)Consider if eos ≥300 cells/µL or if eos ≥100 cells/µL and ≥2 moderate exacerbations or >1 hospitalization. eos = blood eosinophil count; ICS = inhaled corticosteroid; LABA = long-acting beta\(_2\) agonist; LAMA = long-acting muscarinic antagonist.

### Table 3. Considerations for Starting Treatment with Inhaled Corticosteroids (ICS)\(^9,36\)

<table>
<thead>
<tr>
<th>Encourage Use</th>
<th>Consider Use</th>
<th>Advise Against Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>• History of asthma</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• History of hospitalization(s) for exacerbations of COPD</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• ≥2 moderate exacerbations of COPD/year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Blood eosinophils &gt;300 cells/µL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• 1 moderate exacerbation of COPD/year</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Blood eosinophils 100–300 cells/µL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Repeated pneumonia events</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• Blood eosinophils &lt;100 cells/µL</td>
<td></td>
<td></td>
</tr>
<tr>
<td>• History of mycobacterial infection</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Patient should be appropriately using one or two long-acting bronchodilators as maintenance therapy prior to considering ICS.
Use of Inhaled Corticosteroids

Monotherapy with ICS is not recommended in patients with COPD unless the patient also has asthma, since it does not improve FEV₁ or decrease exacerbations. Evidence shows that inhaled corticosteroids are most effective when used with long-acting bronchodilators in patients with severe COPD (Grades C and D). Blood eosinophil counts (eos) may help predict response to ICS (eos >300 cells/µL = greater likelihood to respond, eos <100 cells/µL = lower likelihood to respond).

ICS inhalers have adverse effects which need to be considered and discussed before prescribing. ICS adverse effects include:

- Oral candidiasis
- Hoarse voice
- Skin bruising
- Pneumonia

Patients at highest risk of pneumonia related to ICS include patients:
- Who smoke
- Are >55 years of age
- Have a history of pneumonia
- Have a body mass index <25 kg/m²
- Have severe airflow limitation

Figure 12. Triple Therapy Versus Dual Therapy in Patients with Grade C or D COPD

Lower Exacerbation Rate Using LAMA/LABA/ICS

<table>
<thead>
<tr>
<th>Treatment</th>
<th>Exacerbation Rate Per Year</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAMA/LABA</td>
<td>1.21</td>
</tr>
<tr>
<td>LABA/ICS</td>
<td>1.07</td>
</tr>
<tr>
<td>LAMA/LABA/ICS</td>
<td>0.91</td>
</tr>
</tbody>
</table>

Greatest reduction in exacerbation rate with LAMA/LABA/ICS (triple therapy) was seen in patients with eos ≥150 cells/µL

Rate of Moderate or Severe COPD Exacerbation Per Year

IMPACT trial evaluated the use of LAMA/LABA, LABA/ICS, and LAMA/LABA/ICS (single inhaler triple combination) in patients with COPD. LAMA/LABA/ICS had the lowest rate of exacerbations at 0.91/year (p< 0.001). In a sub-group analysis, patients with an eos ≥150 cells/µL showed the greatest reduction in exacerbation rates using LAMA/LABA/ICS.

LAMA/LABA = umeclidinium (LAMA)/ vilanterol (LABA); LABA/ICS = vilanterol (LABA)/fluticasone furoate (ICS); LAMA/LABA/ICS = umeclidinium (LAMA)/vilanterol (LABA)/fluticasone furoate (ICS).
Withdrawal of Inhaled Corticosteroids

Corticosteroid inhalers may need to be discontinued. The dose should be slowly tapered to avoid worsening of symptoms. Caution should be used when withdrawing ICS in patients with blood eos ≥300 cells/µL due to a higher risk of experiencing more exacerbations after stopping ICS.\textsuperscript{9,40–42}

Possible candidates for ICS discontinuation include patients with:\textsuperscript{9}

- Pneumonia
- Inappropriate original indication for ICS
- Lack of response to ICS
- Stable COPD without exacerbation in past year

Figure 13. Tapering Inhaled Corticosteroids\textsuperscript{43–44}

Use Optimal Bronchodilation with LAMA + LABA

ICS High Dose

ICS Medium Dose

6–12 Weeks

ICS Low Dose

6–12 Weeks

ICS Free

• Monitor every 3 months
• Step up ICS gradually if symptoms worsen and patient has ≥2 exacerbations or >1 hospitalization
**When Inhalers are not Enough**

In patients with continued exacerbations despite maximizing inhaler therapy, a referral to a pulmonologist is recommended. Roflumilast or azithromycin may be indicated.\(^9\)

**Table 4. Options for Group D Patients on LABA + LAMA +/- ICS who Still Have Exacerbations\(^9,45–47\)**

<table>
<thead>
<tr>
<th><strong>Roflumilast</strong></th>
<th><strong>Macrolide Antibiotic</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Indicated for patients with FEV &lt;50% with &gt;1 recorded exacerbation requiring systemic steroids, unscheduled healthcare contact, or hospitalization in the previous year.</td>
<td>Azithromycin is the macrolide of choice for this indication. Best evidence is for use in patients who are former smokers. May reduce exacerbation rates in some patients.</td>
</tr>
<tr>
<td>Patients should be on optimal bronchodilatory therapy (LAMA + LABA) +/- ICS. Prescribing should be done by a pulmonologist or designated expert.</td>
<td>Patients should be on optimal bronchodilatory therapy (LAMA + LABA) +/- ICS. Prescribing should be done by a pulmonologist or designated expert.</td>
</tr>
<tr>
<td>Avoid use in patients with depression; may increase risk of suicide. Contraindicated in patients with moderate to severe liver impairment.</td>
<td>Associated with an increased incidence of bacterial resistance, prolongation of QTc interval, and impaired hearing tests.</td>
</tr>
<tr>
<td>Roflumilast 500 mg tablet orally once daily; may initiate at 250 mg daily for 4 weeks to reduce adverse effects.</td>
<td>Azithromycin 250 mg orally once daily or 500mg three times weekly.</td>
</tr>
</tbody>
</table>

Figure 14. Non-pharmacologic Treatments Recommended by Group Classification

Non-pharmacologic Therapies

**Groups** A B C D

- Smoking cessation
- Increasing physical activity
- Ensuring adequate sleep
- Healthy diet

**Groups** B C D

- Learning to self-manage breathlessness
- Energy conservation techniques
- Stress management strategies
- Pulmonary Rehabilitation

**Groups** C D

- Avoiding aggravating factors
- Monitoring and managing symptoms
- Using a written action plan
- Communicating regularly with care team

**Groups** D

- Discussing palliative strategies
- Preparing advanced care directives

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**Non-pharmacologic Treatments Benefit Everyone!**

Non-pharmacologic treatments are a vital part of the treatment plan for all patients with COPD.

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**Pulmonary Rehabilitation**

Pulmonary rehabilitation is an evidence-based, multidisciplinary intervention for patients with chronic respiratory disease who are symptomatic and have a reduction in daily life activities.9,12,50,51

Pulmonary Rehabilitation:

- Reduces symptoms, optimizes functional status, increases participation, and reduces healthcare costs through stabilizing or reversing systemic manifestations of the disease.
- May benefit patients with COPD groups B, C, and D\(^9\)
- Should be provided at diagnosis, at discharge after hospitalization for an exacerbation, or when symptoms are progressively deteriorating\(^9\). Check with your local facility about the referral process for Pulmonary Rehabilitation.

**Oxygen Therapy**

Using supplemental oxygen long-term (>15 hours a day) increases survival in patients with chronic respiratory failure and severe chronic resting hypoxemia.\(^52\) In patients with stable COPD and moderate resting or exercise-induced arterial desaturation, however, long-term oxygen does not prolong survival or time to first hospitalization or provide sustained benefit in health status, lung function, or 6-minute walk distance.\(^53\)

**Figure 15. Oxygen is Indicated When Oxygen Saturation (\(\text{SaO}_2\)) Falls Below 88%\(^9,12\)**

- \(\text{SaO}_2 < 88\%\) +/- Hypercapnia
- \(\text{SaO}_2\) of 89 to 90% + pulmonary HTN, peripheral edema from HF, or polycythemia*

\(\text{CHF} =\) congestive heart failure; \(\text{HTN} =\) hypertension; \(\text{SaO}_2 =\) Oxygen saturation. *Polycythemia defined as hematocrit >55%.

Recheck \(\text{SaO}_2\) 60 to 90 days after starting oxygen therapy to decide if:
- Supplemental oxygen is still indicated
- Prescribed supplemental oxygen is effective

**Acute Exacerbations**

A COPD exacerbation is defined as an acute worsening of respiratory symptoms that requires additional therapy. This section will focus on medication management and will not include non-invasive or invasive ventilation techniques for severe exacerbations of COPD.
Exacerbations can be classified as:\textsuperscript{6,9,12}
- Mild – treated with short-acting bronchodilators only
- Moderate – treated with short-acting bronchodilators plus antibiotics and/or oral corticosteroids
- Severe – requires hospitalization or visit to the emergency department

The most common causes of exacerbations are respiratory tract infections. Long-term prognosis following hospitalization for COPD exacerbation is poor with a 5-year mortality rate of about 50%.\textsuperscript{54–57}

**Figure 16. Factors Associated with Poor Outcome After an Exacerbation\textsuperscript{54–57}**

Patients with these factors should have close follow-up since they are at higher risk for another exacerbation.
Figure 17. **Recommended Approach to Managing COPD Exacerbations**

- **Systemic corticosteroids for no more than 5 to 7 days.** Prednisone 40 mg daily for 5 days is recommended.
- **Antibiotics when indicated for no more than 5 to 7 days.**
- **Do not use theophylline due to lack of evidence for benefit and significant side effects.**

**When Indicated Based on Symptoms:**

- **Oral Steroid Use**
  - Typical oral steroid regimen is prednisone 40 mg orally daily for 5 days.
  - Steroid use >5 days was not shown to improve outcomes and will increase side effects.
  - Use for patients with a poor response to bronchodilators.
  - Prednisone does not need to be tapered when using a 5-day course.

**All Patients:**

- Short-acting inhaled beta2-agonist (SABA) with or without short-acting muscarinic antagonist (SAMA).
- Continue long-acting bronchodilators.

**Oral Steroid Use**

- Systemic corticosteroids for no more than 5 to 7 days. Prednisone 40 mg daily for 5 days is recommended.
- Antibiotics when indicated for no more than 5 to 7 days.
- Do not use theophylline due to lack of evidence for benefit and significant side effects.

**Figure 18. Re-exacerbation Rates are Similar Using Prednisone for 5 Days Compared to 14 Days**

![Graph showing re-exacerbation rates](image.png)

- Percentage of Patients with Re-exacerbation in 180 Days
- 5 Day Course: 37.2%
- 14 Day Course: 38.4%
Antibiotics are indicated when there is an increase in sputum purulence along with increased dyspnea or an increase in sputum volume.

**Figure 19. When to Use Antibiotics**

- Increased Sputum Purulence
- Increased Dyspnea or Sputum Volume

Antibiotics

Choice of antibiotic should be based on local resistance patterns, but empirical therapy is usually amoxicillin + clavulanic acid, macrolide (e.g., azithromycin), or second generation cephalosporin (e.g., cefuroxime).

---

**Figure 20. Interventions that May Reduce the Frequency of COPD Exacerbations**

<table>
<thead>
<tr>
<th>Long-acting Bronchodilators</th>
<th>Corticosteroid-containing Regimens</th>
<th>Anti-inflammatory (non-steroid)</th>
<th>Anti-infectives</th>
<th>Non-pharmacologic</th>
</tr>
</thead>
<tbody>
<tr>
<td>LAMA</td>
<td>LABA + ICS</td>
<td>Roflumilast</td>
<td>Vaccines</td>
<td>Smoking Cessation</td>
</tr>
<tr>
<td>LABA</td>
<td>LAMA + LABA + ICS</td>
<td></td>
<td>Long-term Macrolides</td>
<td>Pulmonary Rehabilitation</td>
</tr>
<tr>
<td>LAMA + LABA</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Treat an exacerbation with short-acting beta-agonist(s), continue long-acting bronchodilator(s), and give short courses of oral corticosteroids (5-days) and antibiotics (5–7 days) when indicated.**

---

**Did You Know**

In the VA COPD CARE Service Project, having a clinical pharmacy specialist and a registered nurse involved in seeing patients after hospital discharge for a COPD exacerbation resulted in 0% of patients being readmitted to the hospital or emergency department with a COPD exacerbation at 30-days post discharge.58
Treating comorbidities is very important for optimal management of COPD. Conditions that are of greatest concern:

Figure 21. Important Comorbidities to Treat for Optimal COPD Management

- Heart Failure
- Ischemic Heart Disease
- Osteoporosis
- Obesity
- Arrhythmias
- Pulmonary Embolism
- Depression and Anxiety
- Obstructive Sleep Apnea
- Lung Cancer
Summary of Treatment Approaches

Prevention and treatment of exacerbations involves many different types of pharmacologic and non-pharmacologic treatments. Ensuring that all patients diagnosed with COPD receive the recommended treatments will help reduce exacerbations and hospitalizations. When a Veteran does have a COPD exacerbation, providing evidence based treatments can reduce the rates of future exacerbations and readmissions. A summary of the recommendations are listed below.

Figure 22. Review of the Recommendations for Patients with Stable COPD and Those with COPD Exacerbations

All Patients with Stable COPD
- Smoking Cessation
- Spirometry for diagnosis
- Long-acting bronchodilators
  - LAMA
  - LABA
- Influenza vaccine
- Short-acting beta-agonist for acute symptoms
- Pulmonary Rehabilitation
- Oxygen therapy
  - For severe resting hypoxemia

All Patients Having a COPD Exacerbation
- Short-acting and long-acting bronchodilators
- Corticosteroids
- Antibiotics if indicated
  - After the exacerbation
    - Pulmonary rehabilitation
    - Escalation of therapy
      - Adding second long-acting bronchodilator
      - If on LAMA and LABA, then add ICS

Therapies that May be Overused:
- Oxygen in non-severe resting hypoxemia, especially after an exacerbation
- Inhaled corticosteroids (ICS)
- Antibiotics in treatment of exacerbations
### Appendix A

Your name:______________________

Today’s date:______________________

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

This questionnaire will help you and your healthcare professional to measure the impact that 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 gain the greatest benefit from the treatment.

For each item below, place a mark (X) in the box that best describes your current situation. Please ensure that you only select one response for each question.

**Example:** I am very happy [X] 2 3 4 5 I am very sad

<table>
<thead>
<tr>
<th>Item</th>
<th>Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>I never cough</td>
<td></td>
</tr>
<tr>
<td>I cough all the time</td>
<td></td>
</tr>
<tr>
<td>I have no phlegm (mucus) on my chest at all</td>
<td></td>
</tr>
<tr>
<td>My chest is full of phlegm (mucus)</td>
<td></td>
</tr>
<tr>
<td>My chest does not feel tight at all</td>
<td></td>
</tr>
<tr>
<td>My chest feels very tight</td>
<td></td>
</tr>
<tr>
<td>When I walk up a hill or a flight of stairs I am not out of breath</td>
<td></td>
</tr>
<tr>
<td>When I walk up a hill or a flight of stairs I am completely out of breath</td>
<td></td>
</tr>
<tr>
<td>I am not limited to doing any activities at home</td>
<td></td>
</tr>
<tr>
<td>I am completely limited to doing all activities at home</td>
<td></td>
</tr>
<tr>
<td>I am confident leaving my home despite my lung condition</td>
<td></td>
</tr>
<tr>
<td>I am not confident leaving my home at all because of my lung condition</td>
<td></td>
</tr>
<tr>
<td>I sleep soundly</td>
<td></td>
</tr>
<tr>
<td>I do not sleep soundly because of my lung condition</td>
<td></td>
</tr>
<tr>
<td>I have lots of energy</td>
<td></td>
</tr>
<tr>
<td>I have no energy at all</td>
<td></td>
</tr>
</tbody>
</table>

**TOTAL SCORE** 

A COPD assessment test was developed by an interdisciplinary group of international COPD experts with support from GSK. GSK’s activities in connection with the COPD assessment test are monitored by a supervisory council that includes external, independent experts, one of which is chair of the council.

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## Modified Medical Research Council Breathlessness Scale

<table>
<thead>
<tr>
<th>Grade</th>
<th>Description of Breathlessness</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>I only get breathless with strenuous exercise</td>
</tr>
<tr>
<td>1</td>
<td>I get short of breath when hurrying on level ground or walking up a slight hill</td>
</tr>
<tr>
<td>2</td>
<td>On level ground, I walk slower than people of the same age because of breathlessness, or have to stop for breath when walking at my own pace</td>
</tr>
<tr>
<td>3</td>
<td>I stop for breath after walking about 100 yards or after a few minutes on level ground</td>
</tr>
<tr>
<td>4</td>
<td>I am too breathless to leave the house or I am breathless when dressing</td>
</tr>
</tbody>
</table>
REFERENCES


This reference guide was created as a tool for VA providers and is available from the Academic Detailing Service SharePoint.

These are general recommendations only. The treating provider should make clinical decisions based on an individual patient’s clinical condition.

VA PBM Academic Detailing Service Email Group
PharmacyAcademicDetailingProgram@va.gov

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