U.S. Department of Veterans Affairs
Veterans Health Administration
PBM Academic Detailing Service

A QUICK REFERENCE GUIDE (2019)

COPD

Chronic Obstructive Pulmonary Disease (COPD)

VA PBM Academic Detailing Service

Real Provider Resources

Real Patient Results

Your Partner in Enhancing Veteran Health Outcomes

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

VA PBM Academic Detailing Service SharePoint Site
https://vaww.portal2.va.gov/sites/ad

VA PBM Academic Detailing Public Website
http://www.pbm.va.gov/PBM/academicdetailingservicehome.asp

Table of Contents

Abbreviations

CAT = COPD Assessment Test

DPI = Dry Powder Inhaler

HF = Heart Failure

HTN = Hypertension

ICS = Inhaled Corticosteroid

IIV = Inactivated Influenza Vaccine

LABA = Long-Acting Beta$_2$ Agonists

LAMA = Long-Acting Muscarinic Antagonist

MDI = Metered Dose Inhaler

mMRC = Modified Medical Research Council Breathlessness Scale

NRT = Nicotine Replacement Therapy

RIV = Recombinant Influenza Vaccine

RZV = Recombinant Zoster Vaccine

SABA = Short-Acting Beta$_2$ Agonists

SAMA = Short-Acting Muscarinic Antagonist

SaO_2 = Oxygen Saturation

SMI = Soft Mist Inhaler

ZVL = Zoster Vaccine Live

Elements of a COPD Treatment Plan[1,2]

Smoking Cessation	Quitting has the greatest impact on slowing COPD progression.
Vaccines	Influenza vaccine helps reduce COPD exacerbations and hospitalizations. Pneumococcal vaccine PPSV23 reduces the rates of community-acquired pneumonia in patients with COPD.
Pharmacotherapy for COPD	Pharmacotherapy reduces symptoms, frequency and severity of exacerbations, and improves exercise tolerance and health status.
Non-pharmacologic Therapies	Proper nutrition, exercise, and use of pulmonary rehabilitation helps improve quality of life and reduce exacerbations.
Treating Other Comorbidities	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.

Brief Tobacco Cessation Counseling – the 5 As[3]

All Providers are Involved

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 (**www.pbm.va.gov**).

Not Ready to Quit in the Next 30 Days? – Try Using the 5 Rs to Build Motivation[3]

RELEVANCE

What are some things that concern you about smoking?

For example, heath concerns, affect on family, finances, etc.

RISKS

What effect has tobacco had on your health?

Reviewing risks of using tobacco and then discussing the benefits of quitting helps increase motivation to quit. Focus on the health improvements from quitting.

REWARDS

What will you gain by quitting tobacco?

Awareness of rewards helps maintain motivation during the quit attempt.

ROADBLOCKS

What barriers do you see that may impact your ability to quit?

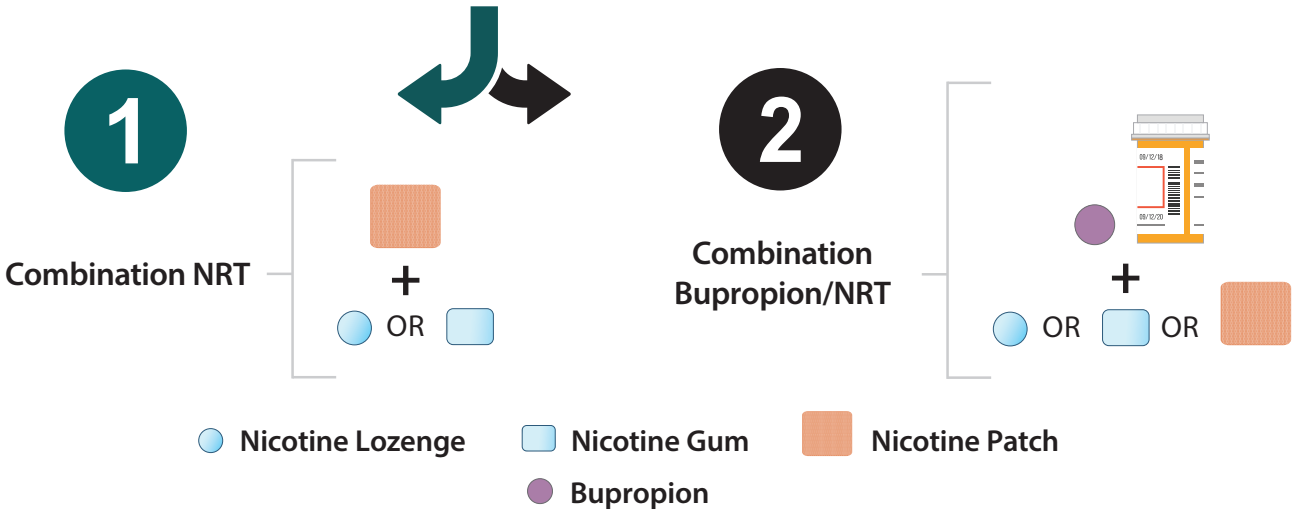
Common barriers are withdrawal symptoms, fear of failure, lack of support, depression, and being around other smokers. Identifying barriers and what has contributed to relapse in the past, can help in planning for the next quit attempt.

REPETITION

Ask readiness to quit at each encounter.

Ask permission to check in at the next visit. The more healthcare providers talk about tobacco cessation, the greater the likelihood a patient may try to stop.

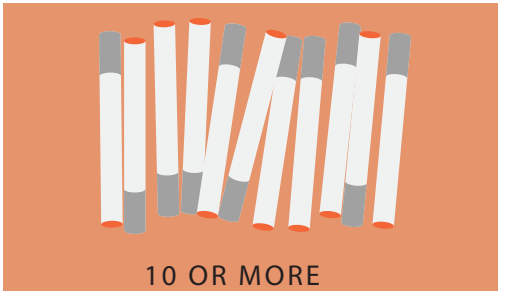
First-line Therapies for Tobacco Cessation



Monotherapy with Nicotine Replacement Therapy (NRT) or bupropion can be considered for patients who are unable to tolerate combination therapy or wish to use monotherapy; however, cessation rates may be lower.

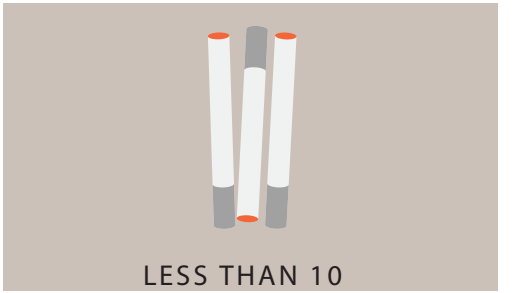
Recommended Starting Dose for Combination NRT[4]

DAILY CIGARETTE CONSUMPTION



21MG PATCH + OR

2MG LOZENGES* 2MG GUM

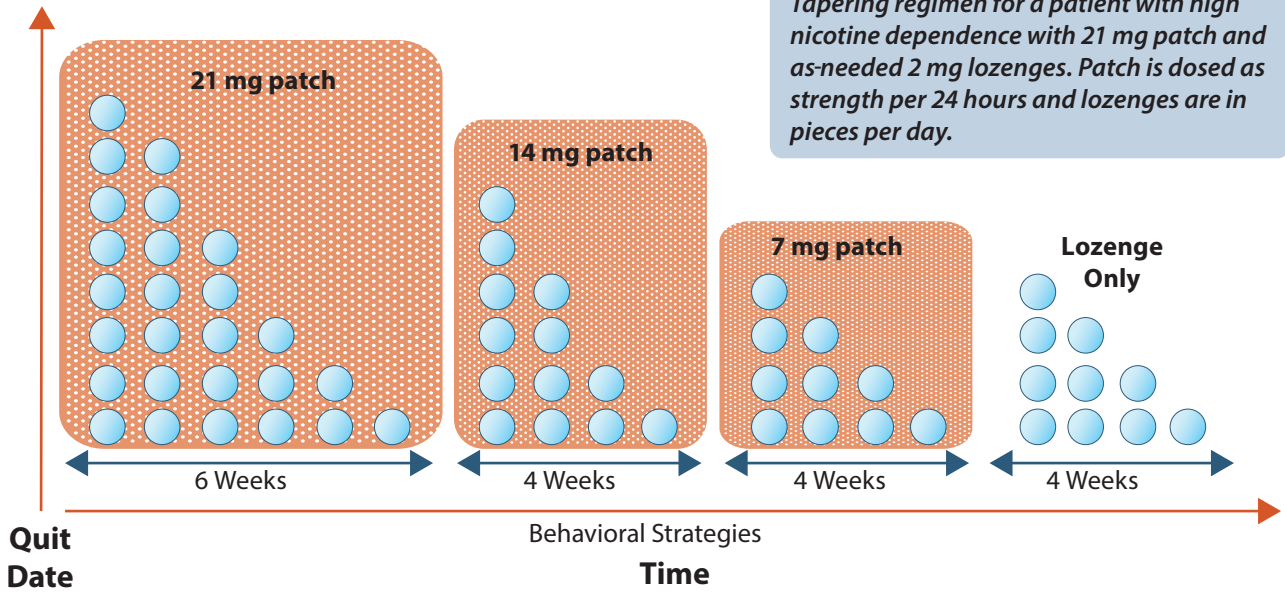


14 MG PATCH + OR

2MG LOZENGES 2MG GUM

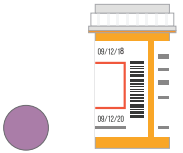
*4MG LOZENGES OR GUM CAN BE CONSIDERED IN HIGHLY DEPENDENT PATIENTS

Tapering Examples for Combination NRT[2,4]



Tapering regimen for a patient with high nicotine dependence with 21 mg patch and as-needed 2 mg lozenges. Patch is dosed as strength per 24 hours and lozenges are in pieces per day.

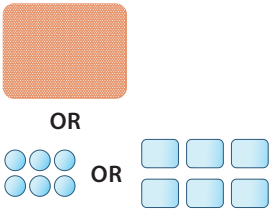
Combination Bupropion/NRT[5,6]



SEVEN TO 14 DAYS BEFORE QUIT DAY

Start bupropion at 150mg SR once daily for three days then increase to 150mg SR twice daily.

NRT is not started until quit day.



QUIT DAY

Start NRT:
Nicotine patch, lozenge, or gum.*

Continue bupropion 150mg SR twice daily.

WHEN TO STOP

Continue bupropion for eight to 12 weeks or longer, if appropriate.**

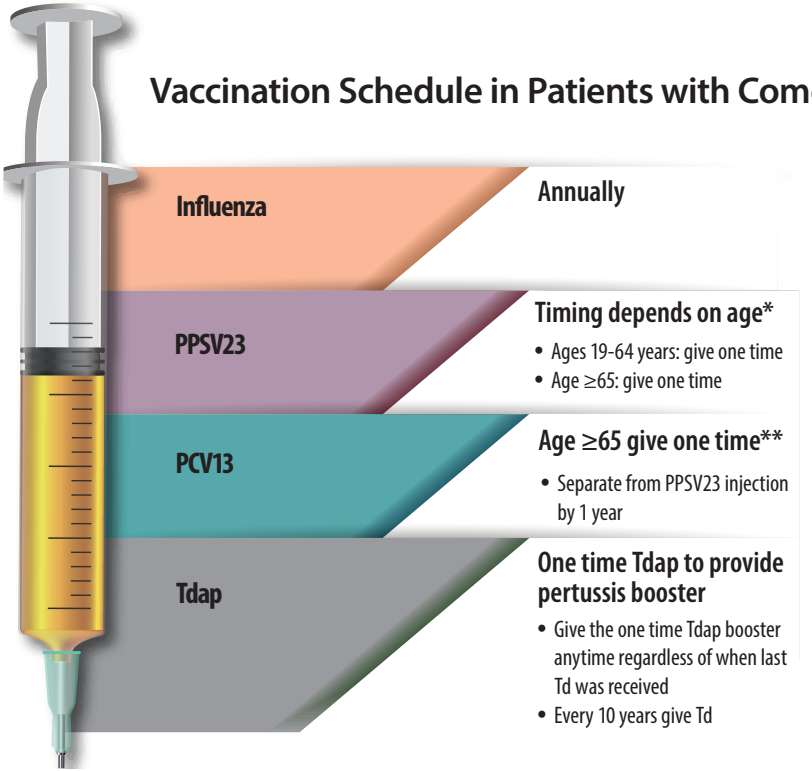
Stop nicotine patch at the same time as bupropion. If using nicotine lozenge or gum, then taper using the same schedule as combination NRT.

*Only use one form of NRT when used in combination therapy with bupropion. Current evidence does not show that using multiple forms of NRT with bupropion is more effective. Nicotine lozenge or nicotine gum in combination with bupropion may be more effective than nicotine patch in combination with bupropion, based on current clinical evidence. **Bupropion may help with depressive symptoms, so some patients may benefit from longer term use.

Vaccines in Patients with COPD[1,2,9]

Vaccine	Why in COPD?	Adverse Effects	Scheduling
Influenza (IIV, RIV)	Reduces incidence of lower respiratory infections and death	Injection site reactions, myalgia, headache, diarrhea	1 dose annually
Pneumococcal Polysaccharide (PPSV23)	Reduces incidence of community-acquired pneumonia	Fatigue, loss of appetite, injection site reactions, fever, headache	Age 19–64: 1 dose Age 65+: 1 dose
Pneumococcal Conjugate (PCV13)	Reduces incidence of bacteremia and invasive pneumococcal disease	Fatigue, loss of appetite, injection site reactions, fever, headache	Age 65+: 1 dose
Zoster (RZV, ZVL)	Increased risk of shingles in patients with COPD.	Injection site reactions, myalgia, headache, nausea, shivering	Ages 50+: 2 doses given 2–6 months apart
Tetanus, Diphtheria (Td), Pertussis (Tdap)	Increased severity of pertussis infection in patients with COPD.	Injection site reactions, GI upset, fatigue, headache	One-time booster dose with Tdap then give Td every 10 years

Vaccination Schedule in Patients with Comorbid COPD[1,2,9]



*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**.

Pharmacotherapy Initiation[1,2,7,8]

Exacerbation History			
0 or 1 exacerbations not leading to hospital admission		≥2 exacerbations or ≥1 leading to hospital admission	
Assessment of Symptoms/Risk of Exacerbations			
Milder Symptoms	Worsening Symptoms	Milder Symptoms	Worsening Symptoms
mMRC 0–1 or CAT <10	mMRC ≥2 or CAT ≥10	mMRC 0–1 or CAT <10	mMRC ≥2 or CAT ≥10

*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$_2$ agonists; LAMA = long-acting muscarinic antagonist; SABA = short-acting beta$_2$ agonists; SAMA = short-acting muscarinic antagonist.

continued from page 11 (Pharmacotherapy Initiation1,2,7,8)

<table>
<tr><th colspan="4">Exacerbation History</th></tr>
<tr><th>Group A</th><th>Group B</th><th>Group C</th><th>Group D</th></tr>
<tr><td>Bronchodilator (long-acting or short-acting)</td><td>LAMA or LABA</td><td>LAMA</td><td>LAMA or LAMA + LABA*</td></tr>
<tr><td>Persistent symptoms – use a LAMA or LABA

Occasional dyspnea – use a SAMA or SABA</td><td colspan="2">If persistent symptoms on long-acting monotherapy then use LAMA + LABA</td><td>If persistent symptoms on maximal inhaler therapy, consultation with a pulmonologist is recommended.</td></tr>
<tr><td colspan="4">Short-acting agents (SAMA or SABA) should be considered for patients on long-acting bronchodilators who need immediate relief.</td></tr>
</table>

*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$_2$ agonists; LAMA = long-acting muscarinic antagonist; SABA = short-acting beta$_2$ agonists; SAMA = short-acting muscarinic antagonist.

Rescue Inhalers (Use only for Intermittent Symptoms)[1,2,10–14]

Inhaler Formulations	Duration of Action	Dosing	Comments
Short-Acting Beta$_2$ Agonists (SABA)			
Albuterol $	4–6 hours	MDI, DPI: 2 inhalations every 4–6 hours as needed. Nebulizer*: 2.5 mg every 6–8 hours as needed.	Monitor for sinus tachycardia, tremors, nervousness, hypokalemia.
Levalbuterol $	6–8 hours	MDI: 2 inhalations every 4–6 hours as needed. Nebulizer*: 0.63 mg every 6–8 hours as needed, 3 times per day.	
Short-Acting Muscarinic Antagonist (SAMA)			
Ipratropium $	6–8 hours	MDI: 2 inhalations up to 4 times per day. Nebulizer*: 500 mcg every 6–8 hours.	Monitor for dry mouth and urinary symptoms. Monitor for increased side effects in combination with LAMAs.

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+
*May be more convenient for patients who are acutely ill or patients unable to use inhaler devices; patients not responding may benefit from increased dosage. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 13 (Rescue Inhalers (Use only for Intermittent Symptoms)1,2,10–14)

Inhaler Formulations	Duration of Action	Dosing	Comments
Combination SABA/SAMA			
Albuterol/ Ipratropium $	6–8 hours	SMI: 1 inhalation up to 4 times daily. Nebulizer*: one 3 mL vial 4 times daily.	Superior to either medication alone. Monitor for side effects of individual components.

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+
*May be more convenient for patients who are acutely ill or patients unable to use inhaler devices; patients not responding may benefit from increased dosage. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

Why Use Long-acting Bronchodilators Over Short-acting Bronchodilators for Persistent Symptoms®?

Long-acting Bronchodilators

- Improve lung function
- Improve dyspnea
- Improve health status
- Reduce exacerbations

Short-acting Bronchodilators

- Improve dyspnea
- Temporarily improve lung function

Maintenance Inhalers[1,2,10–14,15]

Inhaler Formulations	Duration of Action	Dosing	Comments
Long-Acting Muscarinic Antagonist (LAMA)			
Tiotropium $	24 hours	DPI: 2 inhalations of contents of 1 capsule daily. SMI: 2 inhalations once daily.	Monitor for increased side effects in combination with SAMAs. May be used as initial monotherapy in all groups. Monitor for dry mouth and urinary symptoms. Use soft mist inhaler (e.g., Respimat®) as first line formulation since it is easier to use.
Glycopyrrolate $$	12–24 hours	DPI: Inhale contents of 1 capsule twice daily. Nebulizer: 25 mcg every 12 hours.	
Umeclidinium $$$$	24 hours	DPI: 1 inhalation once daily.	
Aclidinium $$$$	12 hours	DPI: 1 inhalation twice daily.	
Revefenacin $$$$	24 hours	Nebulizer: 175 mcg once daily.	

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 15 (Maintenance Inhalers1,2,10–14,15)

Inhaler Formulations	Duration of Action	Dosing	Comments
Long-Acting Beta$_2$ Agonists (LABA)			
Olodaterol $	24 hours	SMI: 2 inhalations once daily.	May be used as initial monotherapy in groups A and B, however using tiotropium (LAMA) first line is a more cost-effective approach. Monitor for sinus tachycardia, tremors, hypokalemia. *Do not use as monotherapy in patients with asthma. These patients should also be using an inhaled corticosteroid (ICS).*
Indacaterol $$	24 hours	DPI: Inhale contents of 1 capsule daily.	
Salmeterol $$$$	12 hours	DPI: 1 inhalation twice daily.	
Arformoterol $$$	12 hours	Nebulizer: 15 mcg every 12 hours.	
Formoterol $$$$	12 hours	Nebulizer: 20 mcg every 12 hours.	

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 15 (Maintenance Inhalers1,2,10–14,15)

Inhaler Formulations	Duration of Action	Dosing	Comments
Inhaled Corticosteroids (ICS)*			
Mometasone $	No bronchodilation effects – dosing based on study dosing and varied drug half-lives.	MDI: 2 inhalations twice daily. DPI: 1–2 inhalations once to twice daily.	*Not to be used as monotherapy in patients without asthma component. Monitor for increased risk of pneumonia, oral candidiasis (thrush), hoarse voice. Rinse mouth with water after use, do not swallow water. Beclomethasone is the only ICS that can be safely used in combination with protease inhibitors.
Ciclesonide $$		MDI: 1–2 inhalations by mouth twice daily.	
Fluticasone Furoate $$$		DPI: 1 inhalation once daily.	
Fluticasone Propionate $$$		MDI: 2 inhalations twice daily. DPI: 1 inhalation twice daily.	
Budesonide $$$		DPI: 2 inhalations twice daily.	
Beclomethasone $$$		MDI: 1 inhalation twice daily.	

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 15 (Maintenance Inhalers1,2,10–14,15)

Inhaler Formulations	Duration of Action	Dosing	Comments
Combination LABA/LAMA			
Olodaterol/ Tiotropium $$	24 hours	SMI: 2 inhalations once daily.	May be used as initial therapy in group D. Do not use with other LABAs or LAMAs. Monitor for side effects of individual components.
Indacaterol/ Glycopyrrolate $$	12–24 hours	DPI: Inhale contents of 1 capsule twice daily.	
Vilanterol/ Umeclidinium $$$$	24 hours	DPI: 1 inhalation once daily.	
Formoterol/ Glycopyrrolate $$$$	12 hours	MDI: 2 inhalations twice daily.	

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 15 (Maintenance Inhalers1,2,10–14,15)

Inhaler Formulations	Duration of Action	Dosing	Comments
Combination LABA/Inhaled Corticosteroid (ICS)			
Formoterol/ Budesonide $	12 hours	MDI: 2 inhalations twice daily.	May be used as initial therapy in group D for patients with asthma. Monitor for side effects of individual components.
Formoterol/ Mometasone $	12 hours	MDI: 2 inhalations twice daily.	
Salmeterol/ Fluticasone $	12 hours	DPI: 1 inhalation twice daily. MDI: 2 inhalations twice daily.	
Vilanterol/ Fluticasone $$$$	24 hours	DPI: 1 inhalation once daily.	
Combination LAMA/LABA/ICS			
Umeclidinium/ Vilanterol/ Fluticasone $$$$	24 hours	DPI: 1 inhalation once daily.	Monitor for side effects of individual components.

Cost for 30-days supply: $ = $0-$49; $$ = $50-$99, $$$ = $100-$199, $$$$ = $200+. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

Types of Inhalers and Use[1,2,10–14]

Inhaler	
Metered Dose Inhalers (MDI)*	
1. Remove cap 2. Shake well prior to use *if using spacer, insert inhaler into spacer 3. Exhale away from inhaler 4. Close lips around inhaler 5. Depress inhaler while inhaling slowly 6. Using with a spacer is highly recommended	**SABA**
	Albuterol (ProAir HFA®, Ventolin HFA®, Proventil HFA®)
	Levalbuterol (Xopenex HFA®)
	SAMA
	Ipratropium (Atrovent HFA®)
	ICS
	Mometasone (Asmanex HFA®)
	Beclomethasone (QVAR Redihaler®)
	Fluticasone (Flovent HFA®)
	Ciclesonide (Alvesco HFA®)

*May require priming before initial use, follow device specific instructions for use. **May come as a capsule, follow device-specific instructions for use. ***Follow device-specific instructions for use. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 20 (Types of Inhalers and Use1,2,10–14)

<table>
<tr><th colspan="2">Inhaler</th></tr>
<tr><th colspan="2">Metered Dose Inhalers (MDI)*</th></tr>
<tr><td rowspan="8">7. Hold breath for at least 5 seconds
8. Exhale away from inhaler
*Remove from spacer if using
9. Repeat if more than one dose needed
10. Place cap back onto inhaler</td><td>LABA/LAMA</td></tr>
<tr><td>Formoterol/glycopyrrolate (Bevespi Aerosphere®)</td></tr>
<tr><td>LABA/ICS</td></tr>
<tr><td>Formoterol/budesonide (Symbicort HFA®)</td></tr>
<tr><td>Formoterol/mometasone (Dulera HFA®)</td></tr>
<tr><td>Salmeterol/fluticasone (Advair HFA®)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
<tr><th colspan="2">Dry Powder Inhalers (DPI)**</th></tr>
<tr><td rowspan="6">1. Ensure doses remaining (dose counter or capsules)
2. Remove cap/open mouthpiece
3. Load the medication and keep inhaler level</td><td>SABA</td></tr>
<tr><td>Albuterol (ProAir RespiClick®)</td></tr>
<tr><td>LABA</td></tr>
<tr><td>Indacaterol (Arcapta Neohaler®), Salmeterol (Serevent Diskus®)</td></tr>
<tr><td colspan="2"></td></tr>
<tr><td colspan="2"></td></tr>
</table>

*May require priming before initial use, follow device specific instructions for use. **May come as a capsule, follow device-specific instructions for use. ***Follow device-specific instructions for use. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 20 (Types of Inhalers and Use1,2,10–14)

Inhaler	
Dry Powder Inhalers (DPI)**	
4. Exhale away from inhaler 5. Close lips around inhaler and inhale quickly for as long as possible 6. Hold breath for at least 5 seconds 7. Exhale away from inhaler 8. Close inhaler and avoid moisture 9. Repeat if more than one dose needed 10. Close cap/mouthpiece 	**LAMA**
	Tiotropium (Spiriva HandiHaler®), Glycopyrrolate (Seebri Neohaler®), Umeclidinium (Incruse Ellipta®), Aclidinium (Tudorza Pressair®)
	ICS
	Mometasone (Asmanex Twisthaler®), Fluticasone (Flovent Diskus®, Arnuity Ellipta®), Budesonide (Pulmicort Flexhaler®)
	LABA/LAMA
	Indacaterol/glycopyrrolate (Utibron Neohaler®), Vilanterol/umeclidinium (Anoro Ellipta®)
	LABA/ICS
	Vilanterol/fluticasone (Breo Ellipta®), Salmeterol/fluticasone (Wixela Inhub™, Advair Diskus®)
	LAMA/LABA/ICS
	Umeclidinium/vilanterol/fluticasone (Trelegy Ellipta®)

*May require priming before initial use, follow device specific instructions for use. **May come as a capsule, follow device-specific instructions for use. ***Follow device-specific instructions for use. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

continued from page 20 (Types of Inhalers and Use1,2,10–14)

Inhaler	
Soft Mist Inhaler (SMI)* **	
1. Hold inhaler upright, with cap closed, turn base in direction of arrows on label 2. Open cap and exhale away from inhaler 3. Close lips around inhaler, avoid covering air vents with hands 4. Inhale slowly and deeply while depressing inhaler's dose button 5. Hold breath for at least 5 seconds 6. Exhale away from inhaler 7. Close inhaler cover 8. Repeat if more than one dose needed	SABA/SAMA Albuterol/Ipratropium (Combivent Respimat®) LABA Olodaterol (Striverdi Respimat®) LAMA Tiotropium (Spiriva Respimat®) LABA/LAMA Olodaterol/Tiotropium (Stiolto Respimat®) 

*May require priming before initial use, follow device specific instructions for use. **May come as a capsule, follow device-specific instructions for use. ***Follow device-specific instructions for use. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

Anti-Inflammatory Medications[1,2,10,11]

Phosphodiesterase-4 (PDE4) Inhibitors	
Dosing	**Comments**
Roflumilast orally once daily Initiate at 250 mcg x 4 weeks then maintenance dose of 500 mcg once daily	Reserve for patients whose inhaler therapy has been optimized. Indicated for patients with FEV <50% with > one exacerbation requiring systemic steroids, unscheduled healthcare contact, or hospitalization in the previous year. Prescribed only by pulmonologist or designated expert. Monitor for nausea, diarrhea, abdominal discomfort, unexplained weight loss, insomnia, and headaches. Avoid use in patients with depression. May increase the risk of suicide. Contraindicated in moderate to severe liver impairment. Extensive hepatic metabolism, so need to monitor for drug interactions.

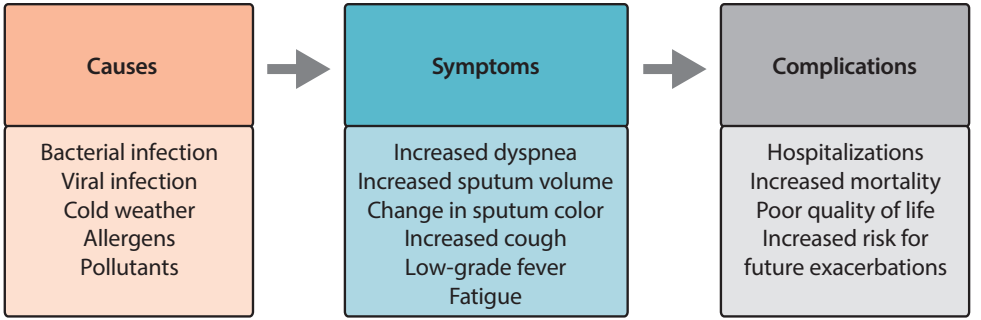
Criteria for use of roflumilast is available at **https://www.pbm.va.gov**. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

Chronic Antibiotics[1,2,10,11]

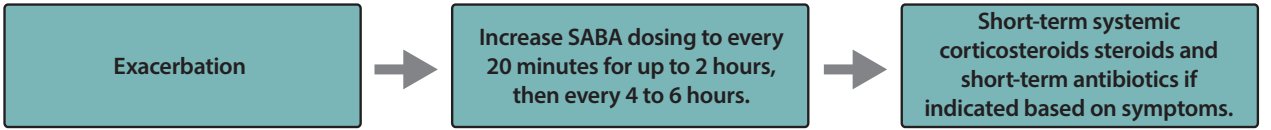
Chronic Azithromycin	
Dosing	**Comments**
Azithromycin 250 mg PO once daily 500 mg PO 3x/weekly	Indicated for patients on LABA/LAMA or LABA/LAMA/ICS with recurrent exacerbations. Associated with increased bacterial resistance, hearing impairments, QTc prolongation. No data showing benefit beyond one-year of treatment. Only use in patients who are former smokers.

VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

COPD Exacerbations[1,2]



Treatment



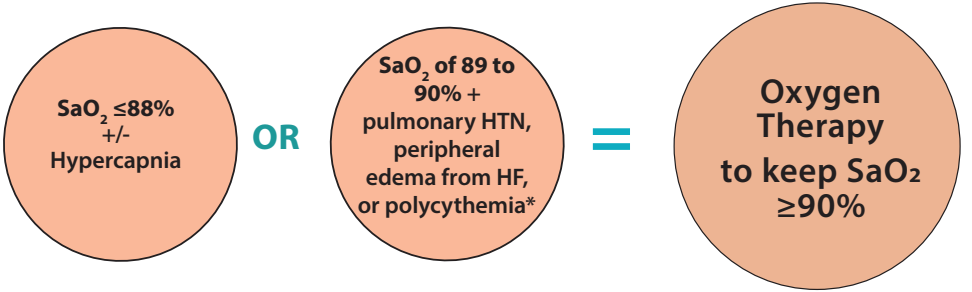
Medications for Acute Exacerbations[*1,2]

Drug	Dose	Comments
Short-term Oral Antibiotics ***Antibiotics may be indicated in the following scenarios: increased sputum purulence, sputum volume, and dyspnea; ≥2 symptoms with at least one being increased sputum purulence; exacerbations requiring mechanical ventilation.***		
Doxycycline	100 mg twice daily	Recommended length of therapy for all antibiotic use in exacerbation is 5–7 days.
Amoxicillin/clavulanate	500 mg every 8 hours OR 875 mg every 12 hours	
Azithromycin	500 mg on day 1, then 250 mg on days 2–5	
Cefuroxime	500 mg twice daily	
Oral Corticosteroids ***In most cases, oral steroids are equally effective as intravenous steroids.***		
Prednisone	40 mg once daily	Recommended length of therapy for steroids is 5 days.
Methylprednisolone	40–60 mg once daily or in two divided doses	

*Increased use of rescue inhaler is appropriate during exacerbations. Do not discontinue maintenance medications. **Use intravenous steroids when exacerbation is considered life-threatening. VA Formulary information at: **www.pbm.va.gov/apps/VANationalFormulary**.

Oxygen Therapy[1,15–17]

Using supplemental oxygen long-term (>15 hours a day) for patients with chronic respiratory failure increases survival in patients who also have severe chronic resting hypoxemia. Oxygen is indicated when oxygen saturation (SaO_2) decreases to ≤88%. Recheck SaO_2 in 60 to 90 days after starting oxygen therapy to determine if supplemental oxygen is effective and still indicated.



*Polycythemia defined as hematocrit >55%. 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.

References

1. Global Initiative for Chronic Obstructive Lung Disease. Global strategy for the diagnosis, management, and prevention of chronic obstructive pulmonary disease. Updated 2020. Global initiative for Chronic Obstructive Lung Disease website. Accessed 11/12/2019. **https://goldcopd.org/wp-content/uploads/2019/11/GOLD-2020-REPORT-ver1.0wms.pdf**
2. Global Initiative for Chronic Obstructive Lung Disease (GOLD). GOLD 2019 Pocket Guide to COPD Diagnosis, Management and Prevention: A Guide for Healthcare Professionals. **https://goldcopd.org/wp-content/uploads/2018/11/GOLD-2019-POCKET-GUIDE-DRAFT-v1.7-14Nov2018-WMS.pdf**. Published 2019. Accessed March 20, 2019.
3. Fiore MC, Jaén CR, Baker TB, et al. Treating Tobacco Use and Dependence: 2008 Update. Clinical Practice Guideline. Rockville, MD: U.S. Department of Health and Human Services. Public Health Service. May 2008.
4. Hsia SL, Myers MG, Chen TC. Combination nicotine replacement therapy: strategies for initiation and tapering. *Preventive Medicine*. 2017; 97:45–49.
5. Piper, M. E., Smith, S. S., Schlam, T. R., et.al. A randomized placebo-controlled clinical trial of 5 smoking cessation pharmacotherapies. *Archives of General Psychiatry*. 2009; 66(11):1253–1262.
6. Smith, S. S., McCarthy, D. E., Japunitch, S. J., et.al. Comparative effectiveness of 5 smoking cessation pharmacotherapies in primary care clinics. *Archives of Internal Medicine*. 2009; 169(22), 2148 2155.
7. Jones PW, Harding G, Berry P, et al. Development and first validation of the COPD Assessment Test. *Eur Respir J*. 2009;34(3):648–54.
8. Fletcher CM. Standardised questionnaire on respiratory symptoms: a statement prepared and approved by the MRC Committee on the Aetiology of Chronic Bronchitis (MRC breathlessness score). *BMJ*. 1960; 2:1662.

continued from page 29 (References)

9. CDC's Vaccine Information for Adults with Lung Disease. Centers for Disease Control and Prevention. **https://www.cdc.gov/vaccines/adults/rec-vac/health-conditions/lung-disease.html**. Published 2019. Accessed March 2019.
10. Clinical Pharmacology [Internet]. Tampa (FL): Elsevier. c2016- [cited 2019 March]. Available from: **http://www.clinicalpharmacology.com**.
11. Micromedex Solutions. Truven Health Analytics, Inc. Ann Arbor, MI. Available at: **http://www.micromedexsolutions.com**. Accessed March 2019.
12. Clinical Resource, Inhaled Medications for COPD. Pharmacist's Letter/Prescriber's Letter. April 2019.
13. Clinical Resource, Correct Use of Inhalers. Pharmacist's Letter/Prescriber's Letter. January 2017.
14. National Asthma Council of Australia. Inhaler Technique for People with Asthma Or COPD. National Asthma Council Australia; 2019. **https://assets.nationalasthma.org.au/resources/Inhaler-Technique-info-paper-20180607-web**. Accessed March 2019.
15. Saberi P, Phengrasamy T, Nguyen DP. Inhaled corticosteroid use in HIV-positive individuals taking protease inhibitors: a review of pharmacokinetics, case reports and clinical management. *HIV Med*. 2013;14(9):519–529. doi:10.1111/hiv.12039.
16. Cranston JM, Crockett AJ, Moss JR, et.al. Domiciliary oxygen for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev*. 2005; (4): CD001744.
17. Long-term Oxygen Treatment Trial Research Group. A randomized trial of long-term oxygen for COPD with moderate desaturation. *NEJM*. 2016; 375(17):1617.

U.S. Department of Veterans Affairs

This reference guide was created to be used as a tool for VA providers and is available to use from the Academic Detailing SharePoint. These are general recommendations only; specific clinical decisions should be made by the treating provider based on an individual patient's clinical condition.

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

VA PBM Academic Detailing Service SharePoint Site
https://vaww.portal2.va.gov/sites/ad/SitePages/Home.aspx

VA PBM Academic Detailing Public Website
http://www.pbm.va.gov/PBM/academicdetailingservicehome.asp

Revised November 2019

IB 10-1156, P96918

www.va.gov