

Chronic Obstructive Pulmonary Disease (COPD)

MSHS Ambulatory Care Pathway



Commonly Used Maintenance Medications in COPD

TYPES OF DELIVERY OPTIONS					
Generic Drug Name	Inhaler Type	Nebulizer	Oral	Injection	Duration of Action
BETA₂-AGONISTS					
Short-Acting (SABA)					
Levalbuterol	MDI	Yes			6-8 hours
Albuterol	MDI & DPI	Yes	Pill, syrup, ext. release tablet	Yes	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		Pill	Yes	4-6 hours
Long-Acting (LABA)					
Formoterol	DPI	Yes			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
ANTICHOLINERGICS					
Short-Acting (SAMA)					
Ipratropium bromide	MDI	Yes			6-8 hours
Long-Acting (LAMA)					
Acidinium bromide	DPI, MDI				12 hours
Glycopyrronium bromide	DPI		Solution	Yes	12-24 hours
Tiotropium	DPI, SMI				24 hours
Umeclidium	DPI				24 hours
COMBINATION LONG-ACTING-BETA₂-AGONIST PLUS ANTICHOLINERGIC IN ONE DEVICE (LABA/LAMA)					
Formoterol/acclidium	DPI				12 hours
Formoterol/glycopyrronium	MDI				12 hours
Indacaterol/ glycopyrronium	DPI				12-24 hours
Vilanterol /umeclidium	DPI				24 hours
Olodaterol/tiotropium	SMI				24 hours
METHYLXANTHINES					
Theophylline (SR)			Pill	Yes	Variable, up to 24 hrs
COMBINATION OF LONG-ACTING BETA₂-AGONIST PLUS CORTICOSTEROIDS IN ONE DEVICE (LABA/ICS)					
Formoterol/budesonide	MDI, DPI				12 hours
Formoterol/mometasone	MDI				12 hours
Salmeterol/fluticasone	MDI, DPI				12-24 hours
Vilanterol/fluticasone furoate	DPI				24 hours
TRIPLE COMBINATION IN ONE DEVICE (LABA/LAMA/ICS)					
Fluticasone/umeclidium/vilanterol	DPI				
PHOSPHODIESTERASE-4 INHIBITORS					
Roflumilast			Pill		

Abbreviations: FEV₁, forced expiratory volume in 1 second; ICS, inhaled corticosteroids; LABA, long-acting β₂-agonist; LAMA, long-acting muscarinic receptor antagonist. Reproduced with permission from the Global Initiative for Obstructive Lung Disease (GOLD), Global Strategy for the Diagnosis, Management and Prevention of COPD, 2017.

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Pharmacologic Treatment Algorithms by GOLD Grade

APPROACH:

- Classify by GOLD Criteria using Modified Medical Research Council (MMRC), COPD Assessment Test (CAT), and # of exacerbations and hospitalizations.
- Patients must see a doctor at least four times (4x) per year for COPD management.

The Modified Medical Research Council (MMRC) Dyspnea Scale

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

Source: Mahler DA, Wells CK. Evaluation of clinical methods for rating dyspnea. Chest 1988; 93:580-586

COPD Assessment Test (CAT)

EXAMPLE ▶ I am very happy 0 ~~1~~ 2 3 4 5 I am very sad

Statement	0	1	2	3	4	5	Score
I never cough	0	1	2	3	4	5	I cough all the time
I have no phlegm (mucus) on my chest at all	0	1	2	3	4	5	My chest is 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 a flight of stairs I am not out of breath	0	1	2	3	4	5	When I walk up a hill or a flight of stairs I am completely out of breath
I am not limited to doing any activities at home	0	1	2	3	4	5	I am completely limited to doing all activities at home
I am confident leaving my home despite my lung condition	0	1	2	3	4	5	I am not confident leaving my home at all because of my lung condition
I sleep soundly	0	1	2	3	4	5	I do not 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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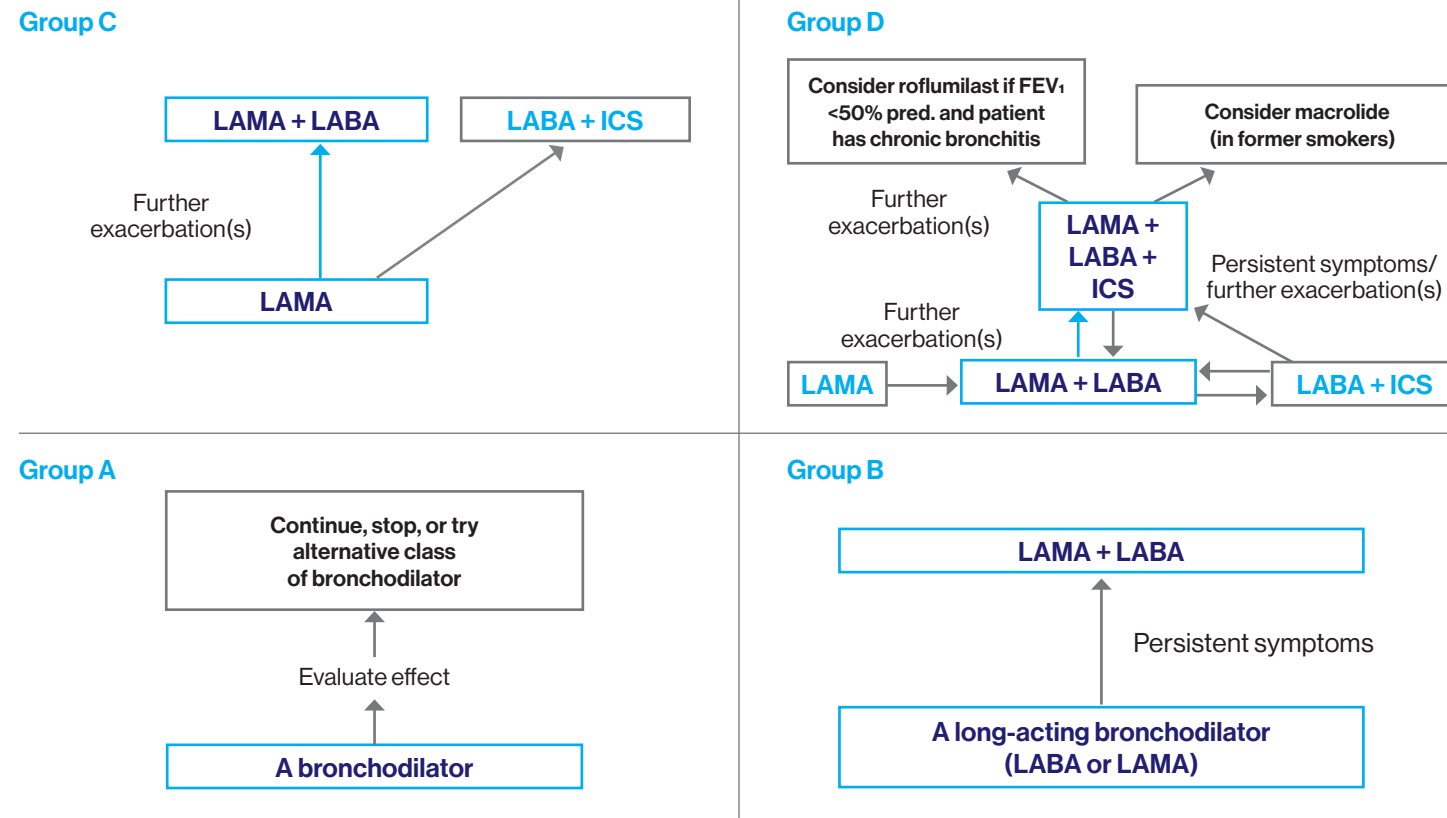
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Medication Guidelines (Groups A-D) Based on GOLD Classification

INITIAL PHARMACOLOGICAL TREATMENTS		
≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	Group C LAMA	Group D LAMA or LAMA + LABA* or ICS + LABA** <small>* Consider if highly symptomatic (e.g. CAT > 20) ** Consider if eos ≥ 300</small>
0 or 1 moderate exacerbations (not leading to hospitalization)	Group A A Bronchodilator	Group B A Long Acting Bronchodilator (LABA or LAMA)
	Dyspnea scale 0-1, CAT <10	Dyspnea scale ≥ 2, CAT ≥ 10

FOLLOW-UP PROTOCOLS



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Non-Pharmacologic Management of COPD

Patients Group	Essential	Recommended	Depending on Local Guidelines
A	Smoking cessation (can include pharmacologic treatment)	Physical activity	Flu vaccine Pneumococcal vaccination
B-D	Smoking cessation (can include pharmacologic treatment) Pulmonary rehabilitation	Physical activity	Flu vaccine Pneumococcal vaccination

Prescription of Supplemental Oxygen to COPD Patients

Arterial hypoxemia defined as: PaO ₂ < 55 mmHg (8 kPa) or SaO ₂ < 88% or PaO ₂ > 55 but 60 mmHg (> 8 but < 8.5 kPa with right heart failure or erythrocytosis)	Prescribe supplemental oxygen and titrate to keep SaO ₂ ≥ 90%	Recheck in 60 to 90 days to assess: <ul style="list-style-type: none"> If oxygen is still indicated If prescribed supplemental oxygen is effective
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Care Coordination in COPD at MSHS

All patients should be evaluated by care management.

- Email mshpcmreferral@mountsinai.org or call 212-241-7228.
- Use the **MSHP Care Management Referral in Epic (order #391414)**.

Behavioral Health

Patients should be screened for depression using the PHQ-2/PHQ-9 and referred to psychiatric services through their current care pathway depending on their clinic.

Clinical Pharmacist

Pharmacists can be a **key part of the care team for chronic disease management**. They are **credentialed providers that can prescribe and adjust medications** through the Collaborative Drug Treatment Model.

Palliative Care Referral Options within Mount Sinai Health System

Patients with COPD may be referred to one of two practices. The services provided at each location are identical; please choose the location that is most convenient to your patient.

Mount Sinai Health System Palliative Care Practices:

- To make a referral to the **Martha Stewart Center for Living** at 1440 Madison Avenue, please call: **212-241-1446**
- To make a referral to the **Martha Stewart Center for Living Downtown** at Union Square, please call: **212-844-1712**