Stepwise Approach to Managing COPD

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Class of 2010

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Objectives

- COPD Prevalence
- Social and economic burden
- Diagnosis
- COVID and COPD
- Pharmacological treatment
- Proper use of inhalers

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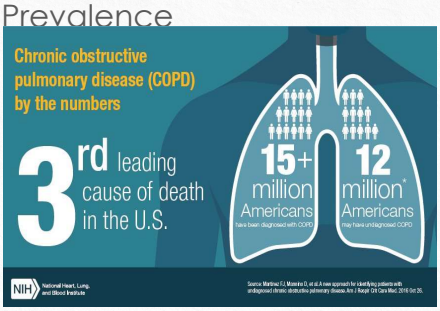
COPD Prevalence



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Background

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Economic Burden

- $ 49 **BILLION**
- Who pays
- Direct vs indirect costs

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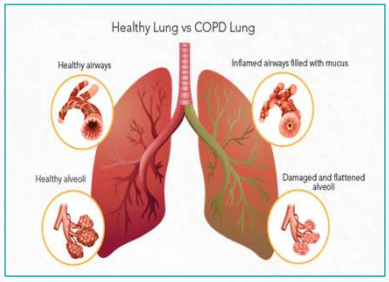
COPD



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Pathway to Diagnosis of COPD

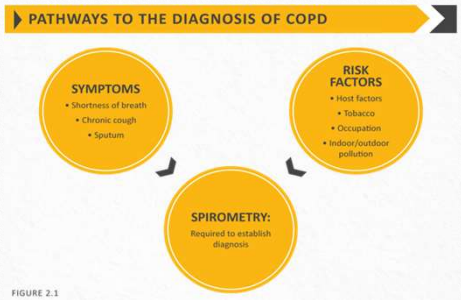

FIGURE 2.1

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Spirometry

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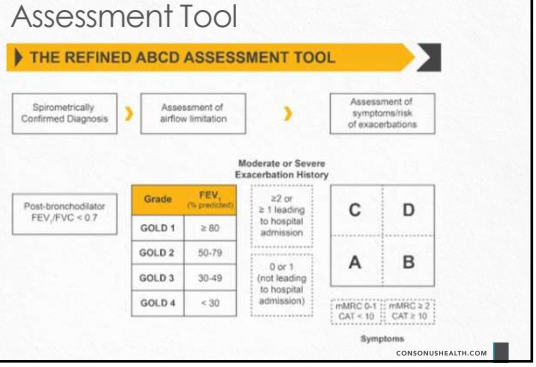
Assessment Tool



Tips for improving COPD Care

- **Focus** both short and long term
- **Remove** causes
- **Prevent** respiratory infections
- **Relieve** symptoms with COPD drugs
- **Prevent** exacerbations with COPD drugs

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Vaccines in Adults

- Pneumococcal Vaccines
- Influenza vaccination
- Tdap
- COVID vaccine

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Differential Diagnosis of COPD

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Alpha-1 Kids

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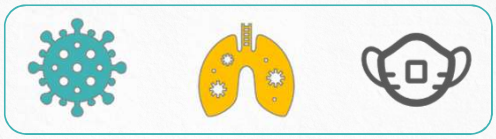
COVID-19 and COPD

- Hospital Admissions
- GOLD recommendations
- COPD and COVID infection risk



Resource: https://doi.org/10.1016/j.amjmed.2021.05.008

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Pharmacological Treatment

- SABA (Ventolin)
- LABA (Serevent)
- SAMA (Atrovent)
- LAMA (Spiriva)
- ICS (Flovent)
- Delivery options

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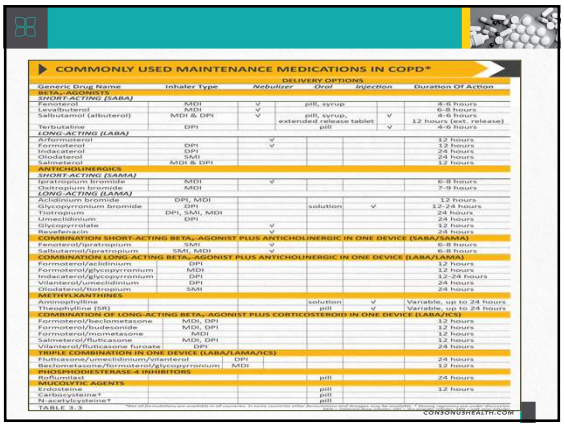

COMMONLY USED MAINTENANCE MEDICATIONS IN COPD*

Generic Drug Name	Inhaler Type	DELIVERY OPTIONS Nebulizer	Oral	Injection	Duration Of Action
BETA2-AGONISTS					
SHORT-ACTING (SABA)					
Fenoterol	MDI	√	pill, syrup		4-6 hours
Levalbuterol	MDI	√			6-8 hours
Salbutamol (albuterol)	MDI & DPI	√	pill, syrup, extended release tablet	√	4-6 hours 12 hours (ext. release)
Terbutaline	DPI		pill	√	4-6 hours
LONG-ACTING (LABA)					
Arformoterol		√			12 hours
Formoterol	DPI	√			12 hours
Indacaterol	DPI				24 hours
Olodaterol	SMI				24 hours
Salmeterol	MDI & DPI				12 hours
ANTICHOLINERGICS					
SHORT-ACTING (SAMA)					
Ipratropium bromide	MDI	√			6-8 hours
Oxitropium bromide	MDI				7-9 hours
LONG-ACTING (LAMA)					
Aclidinium bromide	DPI, MDI				12 hours
Glycopyrronium bromide	DPI		solution	√	12-24 hours
Tiotropium	DPI, SMI, MDI				24 hours
Umeclidinium	DPI				24 hours
Glycopyrrolate		√			12 hours
Revefenacin		√			24 hours
COMBINATION SHORT-ACTING BETA2-AGONIST PLUS ANTICHOLINERGIC IN ONE DEVICE (SABA/SAMA)					
Fenoterol/ipratropium	SMI	√			6-8 hours
Salbutamol/ipratropium	SMI, MDI	√			6-8 hours
COMBINATION LONG-ACTING BETA2-AGONIST PLUS ANTICHOLINERGIC IN ONE DEVICE (LABA/LAMA)					
Formoterol/aclidinium	DPI				12 hours
Formoterol/glycopyrronium	MDI				12 hours
Indacaterol/glycopyrronium	DPI				12-24 hours
Vilanterol/umeclidinium	DPI				24 hours
Olodaterol/tiotropium	SMI				24 hours
METHYLXANTHINES					
Aminophylline			solution	√	Variable, up to 24 hours
Theophylline (SR)			pill	√	Variable, up to 24 hours
COMBINATION OF LONG-ACTING BETA2-AGONIST PLUS CORTICOSTEROID IN ONE DEVICE (LABA/ICS)					
Formoterol/beclometasone	MDI, DPI				12 hours
Formoterol/budesonide	MDI, DPI				12 hours
Formoterol/mometasone	MDI				12 hours
Salmeterol/fluticasone	MDI, DPI				12 hours
Vilanterol/fluticasone furoate	DPI				24 hours
TRIPLE COMBINATION IN ONE DEVICE (LABA/LAMA/ICS)					
Fluticasone/umeclidinium/vilanterol	DPI				24 hours
Beclometasone/formoterol/glycopyrronium	MDI				12 hours
PHOSPHODIESTERASE-4 INHIBITORS					
Roflumilast			pill		24 hours
MUCOLYTIC AGENTS					
Erdosteine			pill		12 hours
Carbocysteine†			pill		
N-acetylcysteine†			pill		

TABLE 3.3

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Adverse Reactions

- ICS
- Albuterol
- Spiriva

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Pharmacological Treatment

Factors to consider when initiating ICS treatment in combination with one or two long-acting bronchodilators (note the scenario is different when considering ICS withdrawal):

· STRONG SUPPORT ·	· CONSIDER USE ·	· AGAINST USE ·
• History of hospitalization(s) for exacerbations of COPD#	• 1 moderate exacerbation of COPD per year#	• Repeated pneumonia events
• ≥ 2 moderate exacerbations of COPD per year#	• Blood eosinophils 100-300 cells/μL	• Blood eosinophils <100 cells/μL
• Blood eosinophils >300 cells/μL		• History of mycobacterial infection
• History of, or concomitant, asthma		

#despite appropriate long-acting bronchodilator maintenance therapy (see Table 3.4 and Figure 4.3 for recommendations);

*note that blood eosinophils should be seen as a continuum; quoted values represent approximate cut-points; eosinophil counts are likely to fluctuate.

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Pharmacological Treatment

Initial pharmacological treatment

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	Group C: LAMA	Group D: LAMA or LAMA + LABA* or ICS + LABA**
0 or 1 moderate exacerbations (not leading to hospital admission)	Group A: A bronchodilator	Group B: A long acting bronchodilator (LABA or LAMA)
	mMRC 0-1, CAT < 10	mMRC ≥ 2, CAT ≥ 10

*Consider if highly symptomatic (e.g. CAT > 20)
**Consider if blood eosinophil count in cells per microliter ≥ 300

mMRC: modified Medical Research Council dyspnea questionnaire
CAT: COPD Assessment Test™
LABA: long-acting beta-2 agonist
LAMA: long-acting muscarinic antagonist
ICS: inhaled corticosteroid

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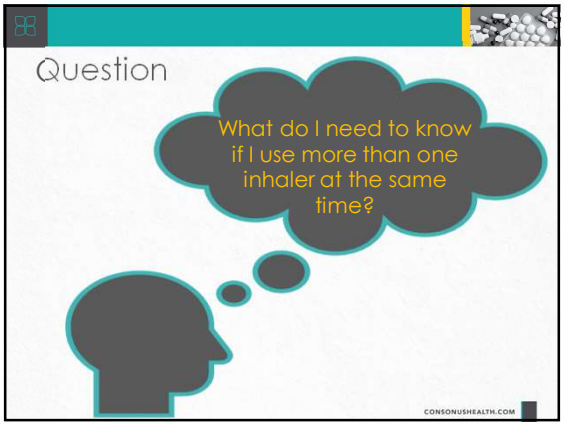
Question



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Answer

What do I need to know if I use more than one inhaler at the same time?

Albuterol > Advair

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Question

How do I know if my inhaler is running out?

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Answer

How do I know if my inhaler is running out?

Most inhalers have counters to keep track of how many doses are left. If your inhaler does not have a counter, keep track of how many doses you have used. Don't remove inhalers from original packaging until you need them. Some expire a few weeks or months after removal from the foil pouch.

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Inhaler Technique

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Inhaler Technique

It is now increasingly widely recognized that a successful treatment outcome in chronic obstructive pulmonary disease depends as much on the inhaler device as it does on the drug. Inhaler choice in chronic obstructive pulmonary disease should take into account whether the patient is likely to use it correctly, as well as patient preference and the likelihood of adherence to treatment.

S. P. Newman, Scientific Consultant, Nottingham, UK.

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How to choose the best inhaler

- Only 50% of people using inhalers have proper technique.

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Metered dose inhaler technique

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Metered Dose Inhalers

Pros:

- Portable (small and compact)
- Rapid medication delivery

Cons:

- Hand- Breath coordination required
- Propellant
- Spacers

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Dry Powder Inhaler Technique

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Dry Powder Inhalers

Pros:

- Breath actuated
- No propellant used
- Less drug remains in the mouth or pharynx

Cons:

- Rapid and forceful inhalation is needed
- Dose needs to be loaded correctly (capsule handling problems)
- Moisture sensitive

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Soft Mist Inhaler Technique

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Soft Mist Inhalers

Pros:

- More medicine gets into lungs than MDI or DPI, so you can use lower dose
- Mist comes out slowly
- Doesn't require coordination

Cons:

- Assembly and priming
- Cost

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Nebulizers

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Nebulizers

Pros:

- Easy to inhale
- Doesn't require coordination

Cons:

- Operating time
- Cost
- Requires power source

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Questions/Discussion

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Resources

- Global Initiative for Chronic Obstructive Lung Disease (GOLD) Guidelines and resources http://goldcopd.org
- WHO
- CDC
- COPD.NHLBI
- IBM Micromedex