

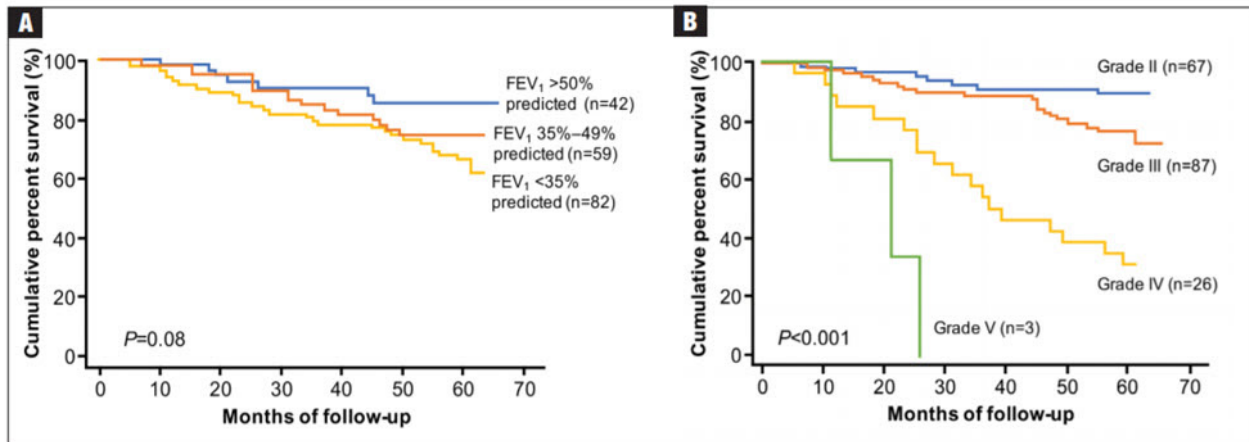
Pulmonary disease

Assessments, tests, and screenings

In this section we jump into pulmonary disease, specifically Chronic obstructive pulmonary disease (COPD): predicting mortality by dyspnea and the use of palliative care, guidelines for COPD management, and new management strategy for mild, persistent asthma.

Predicting mortality in COPD

It's been shown that we cannot predict mortality in COPD based on FEV1, because people can tolerate a low level of FEV1 for quite some time. In order to more accurately predict, we should be using the dyspnea scale.



(A) Grades determined by 1995 American Thoracic Society staging guideline, which is categorized according to percentage of predicted FEV₁. (B) Grades determined by an adapted version of the Medical Research Council grading system (distinct from the modified Medical Research Council scale, which is used widely and cited in the GOLD report,⁵ in which dyspnea is classified from Grade 0 to Grade 4), developed by Fletcher et al²⁵: Grade I, I get breathless at times other than when doing strenuous exercise; Grade II, I am short of breath when hurrying on the level or walking up a slight hill; Grade III, I have to walk slower than most people on the level and I have to stop after a mile or so (or after 1/4 hour) on the level at my own pace; Grade IV, I have to stop for breath after walking about 100 yards (or after a few minutes) on the level; Grade V, I am too breathless to leave the house, or breathless after undressing.

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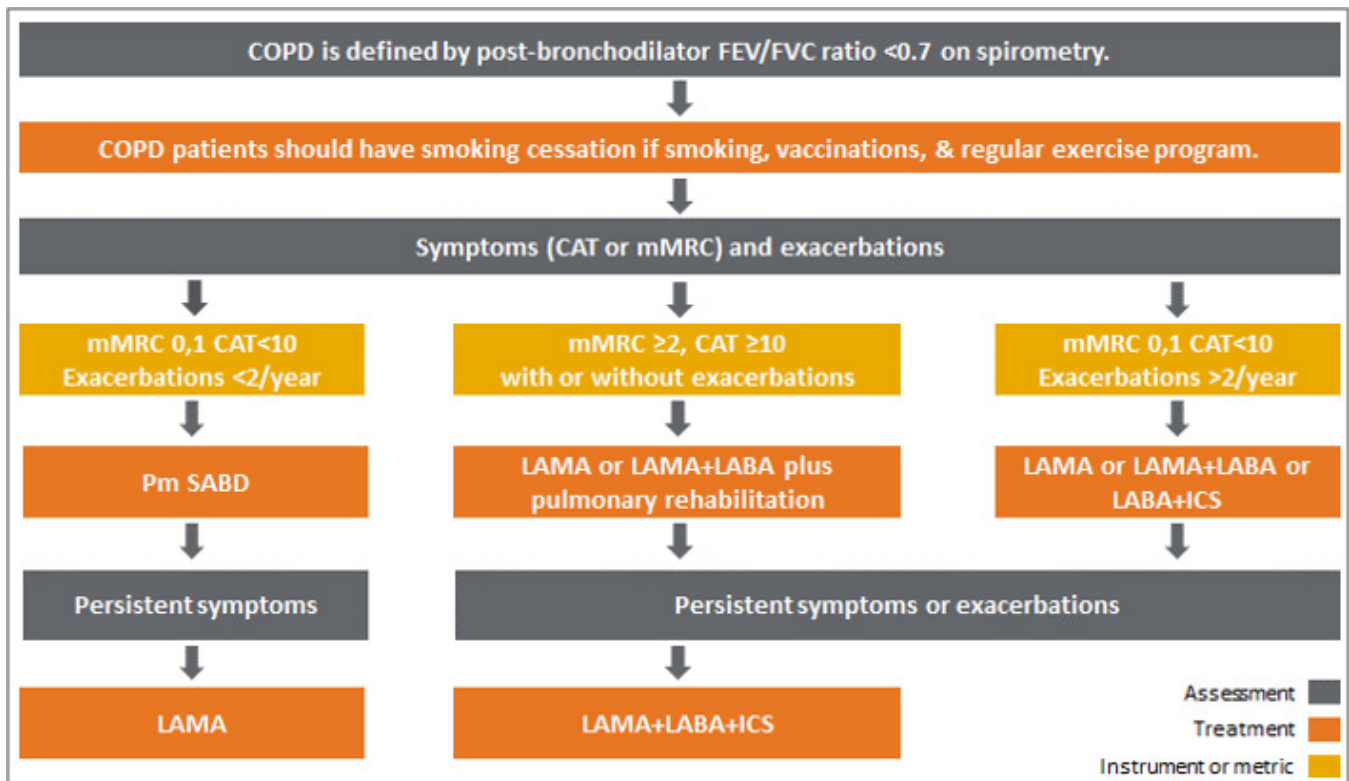
MRC dyspnea scale

Grade	Degree of breathlessness related to activity
1	Not troubled by breathlessness except during strenuous exercise
2	Short of breath when hurrying on level ground or when walking up a slight hill
3	Walks slower than most people on level ground, stops after a mile or so, or stops after 15 minutes walking at own pace
4	Stops for breath after walking; 100 yards, or after a few minutes on level ground
5	Too breathless to leave the house, or breathless when dressing/undressing

COPD guideline

You've more than likely seen the Global Initiative for Chronic Obstructive Lung Disease (GOLD) Guideline when treating COPD. Though it's accurate, it's not straightforward and hard to use in day-to-day practice. Instead, we should be the COPD Foundation Guide (**below**) to help manage COPD. It is easy to follow and essentially has the same outcome as GOLD.

The question is who gets triple therapy? It used to be as things progressed, we would just throw on an ICS. However, it turns out that's not optimal care.

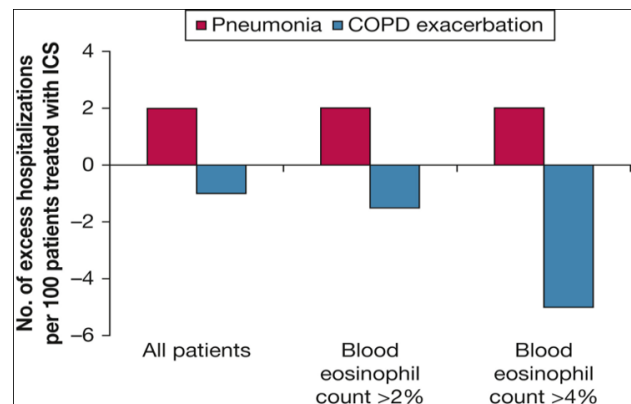


Managing COPD

Let's take a closer look at managing COPD.

ICS use in COPD guided by eosinophil percentage

We've known for some time that once put on a steroid, the rate of bacterial pneumonia goes up. This study quantifies that increase as a function of improvement in COPD exacerbation and stratifies it by blood eosinophil count. If you put all severe COPD patients on triple therapy, you are going to create about 3 pneumonia cases for every one COPD exacerbation that you save. If you only put those that have eosinophil counts greater than 2%, it begins to balance out. Once you get to an eosinophil count greater than 4%, you've identified a group where the savings in COPD exacerbation far outweigh the number of bacterial pneumonias. Using the eosinophil data in a broad population of COPD patients, 70% on average are on an ICS and shouldn't be on one.



Suissa, S., & Ernst, P. (2017). Precision medicine urgency: The case of the inhaled corticosteroids in COPD. *Chest*, 152(2), 227-231.

COPD management by COPD phenotype

When you think about it, the easiest way to manage COPD is by accounting for phenotype. Look at how the patient presents.

Two important types:

Asthma/COPD overlap phenotype	Non Atopic COPD
<ul style="list-style-type: none"> • Typically, there is a history of asthma • Eosinophil percentage >4% • Significant reversibility on PFT's • Best managed with an ICS/LABA combination – prn or daily based upon symptom burden 	<ul style="list-style-type: none"> • Absence of asthma, eosinophil percentage <4% • Therapy cascade: <ul style="list-style-type: none"> • SABA prn (Short Acting Beta Agonist) • Daily LAMA (Long Acting Muscarinic Antagonist) • LAMA/LABA (Long Acting Beta Agonist)

With non-atopic COPD patients, there is no value in adding a steroid to their treatment.

COPD management — General principles

- Treatment is for symptoms and exacerbation prevention: studies have not shown mortality improvement or significant lung function improvement with available therapies
- LAMA is slightly superior to LABA as monotherapy
- ICS only for “atopic” subtype with eosinophils >4%
- Triple inhaler therapy slightly better than LABA/LAMA for advanced disease with frequent exacerbations however, it is associated with increased pneumonia risk (Lancet and NEJM)
- Daytime oxygen therapy of no value with moderate hypoxia (NEJM)

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Mild, persistent asthma — New strategy

Mild, persistent asthma accounts for 50 to 75 percent of all asthma and 40 percent of all severe exacerbations.

Syigma 1 & 2 trials

Consisted of 8,000 patients randomized into two arms:

1. Daily ICS with prn SABA (current standard of care)
2. ICS/LABA *as needed* regimen

Results

- ICS use was 75-83% lower in the *as needed* ICS/LABA regimens compared to the ICS with prn SABA arm.
- Asthma symptom control and pulmonary function were both slightly better in the maintenance arm.

New recommendation (based on the results)

- Initiate treatment for mild persistent asthma with the *as needed*, ICS/LABA regimen.
- If symptoms persist, change to the daily ICS with prn SABA regimen

Why?

Using the *as needed* regimen will:

- markedly decrease ICS consumption
- reduce bone loss from long-term ICS use
- save ~\$1 billion nationally in asthma care



Behaviors to change

Consider the following when moving forward:

- MRC Dyspnea scale is the best predictor of mortality and use of palliative care/hospice
- Use *phenotypic* management of COPD to select optimal pharmacotherapy
- Avoid the overuse of ICS
- Follow new recommendations for mild asthma management