ASTHMA & COPD UPDATE 2023

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OKC VAMD and OUHSC

ASTHMA & COPD UPDATE

- Asthma- Diagnosis and intervention
- Management of the complex asthma patient
- COPD- diagnosis and management
- Additional considerations for the patient with severe COPD

ASTHMA

- GINA (Global Initiative for Asthma) ginasthma.org is an organization that provides yearly updates to asthma care
- Majority of the review today is from the 2023 GINA report

ASTHMA

- The Global Initiative for Asthma defines asthma as follows : "Asthma is a heterogeneous disease, usually characterized by chronic airway inflammation. It is defined by the history of respiratory symptoms such as wheeze, shortness of breath, chest tightness, and cough that vary over time and in intensity, together with variable expiratory airflow limitation.“
- Asthma has been defined by the National Asthma Education and Prevention Program(NAEPP) as "a common chronic disorder of the airways that is complex and characterized by variable and recurring symptoms, airflow obstruction, bronchial hyperresponsiveness, and an underlying inflammation. The interaction of these features of asthma determines the clinical manifestations and severity of asthma and the response to treatment"

ASTHMA

- 1-29% of the population is affected by asthma, depending upon the country
- Triggers of worsening symptoms can include exercise, allergen exposure, change in weather or viral respiratory infections
- Symptoms can be absent for weeks or months at a time
- Exacerbations can be life-threatening, with most asthma deaths in low and middle income countries
- Airway responsiveness and chronic airway inflammation can persist even when symptoms are absent and lung function is normal

ASTHMA

- Approximately 25 million people in the U.S. have asthma. This equals about 1 in 13 people.
- About 20 million U.S. adults age 18 and older have asthma.
- Asthma rates are highest in Black adults in the U.S.
- Asthma is more common in female adults than male adults. Around 9.8% of female adults have asthma, compared to 6.1% of male adults.
- It is a leading chronic disease in children. Currently, there are about 5.1 million children under the age of 18 with asthma.
- Black children are nearly three times more likely to have asthma compared to white children- healthcare disparity.
- Asthma is more common in male children than female children. Around 8.4% of male children have asthma, compared to 5.5% of female children.

ASTHMA

- On average, 11 people in the U.S. die from asthma each day. In 2020, 4,145 people died from asthma. Nearly all of these deaths are avoidable with the right treatment and care.
  - In 2020, deaths due to asthma rose for the first time in 20 years.
- Adults are five times more likely to die from asthma than children.
- Female adults are more likely to die from asthma than male adults, and male children are more likely than female children.
- Black people in the U.S. are nearly three times more likely to die from asthma than white people in the U.S.
- When sex is factored in, Black females have the highest rate of fatality due to asthma. In 2020, Black females were nearly four times more likely to die from asthma than white males

ASTHMA

- In 2018, asthma accounted for 5.8 million doctors' office visits.
- In 2018, asthma accounted for 178,530 discharges from hospital inpatient care and 1.6 million emergency department visits.
- Black people in the U.S. are nearly five times more likely than white people in the U.S. to visit the emergency department due to asthma.
- Medical costs for people with asthma are estimated to be $3,266 higher per year (in 2015 U.S. dollars) compared to medical costs for people without asthma.
- Among children ages 5 to 17, asthma is one of the top causes of missed school days. In 2013, it accounted for more than 13.8 million missed school days.

Asthma:

- Heterogenous
- chronic airway disease with inflammation
- reversible airflow obstruction
- clinical symptoms such as wheezing/cough/shortness of breath
- Status asthmaticus can lead to death

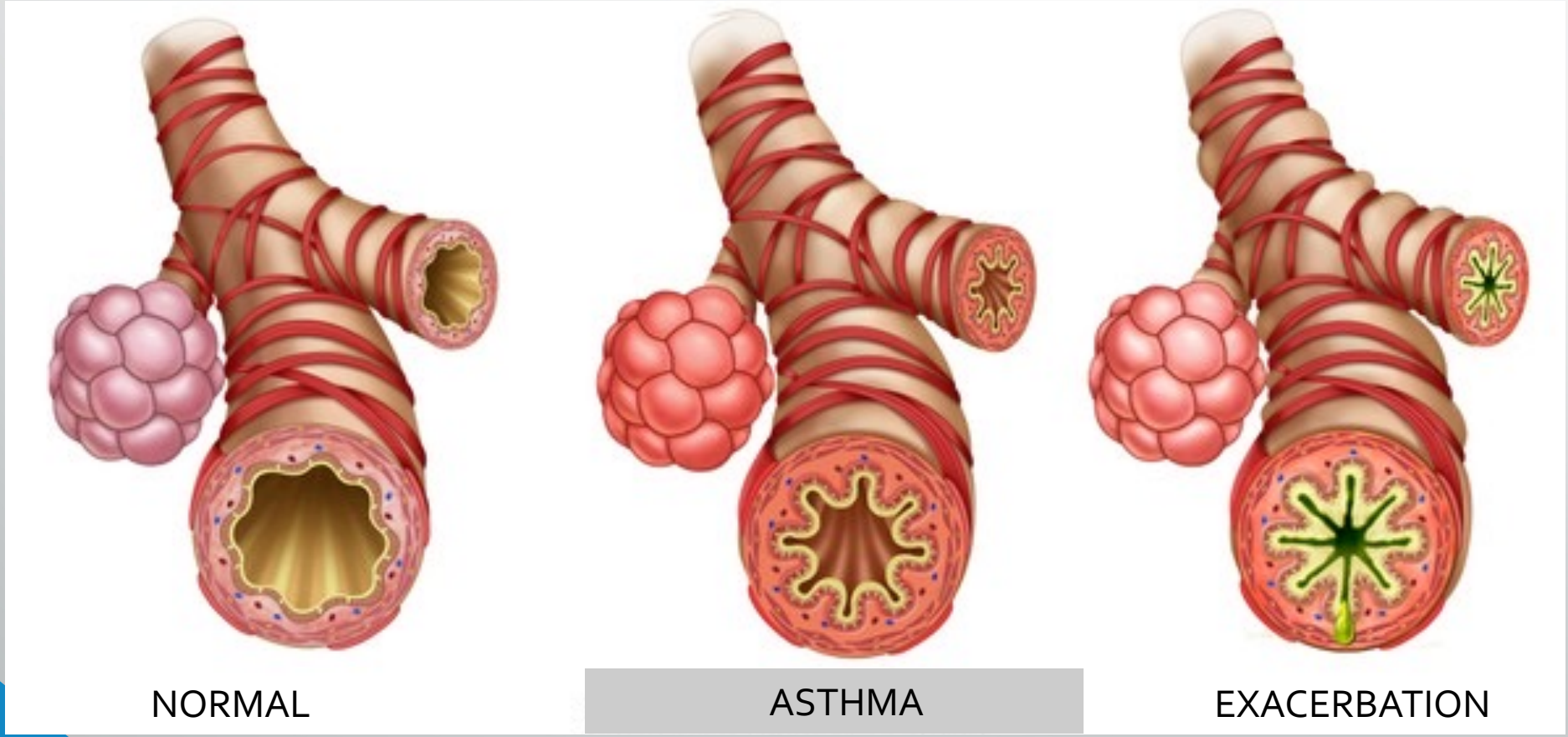
ASTHMA

Respiratory symptoms that are typical of asthma:

- Asymptomatic at baseline
- Intermittent episodes of coughing, wheezing, tachypnea, dyspnea
- Can experience hypoxemia
- Decreased inspiratory/expiratory ratio
- Mucous plugging
- Severe attacks can lead to pulsus paradoxus

Typical triggers can include viral URI, allergens, stress

ASTHMA



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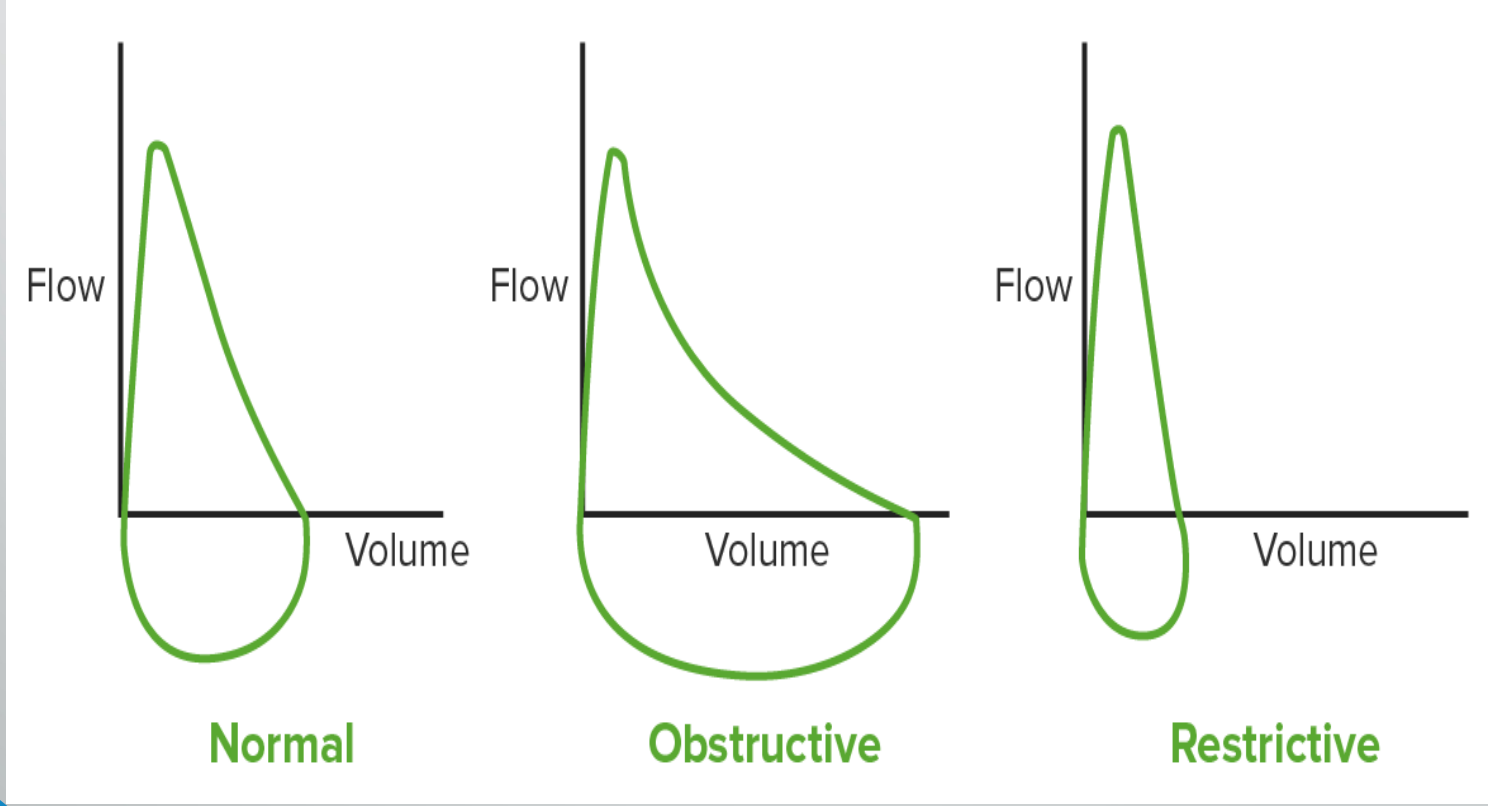
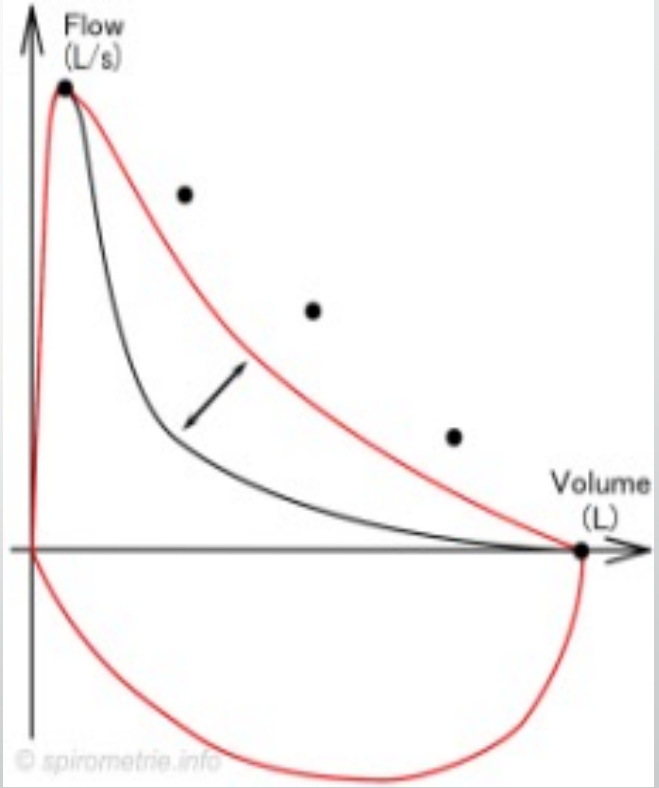
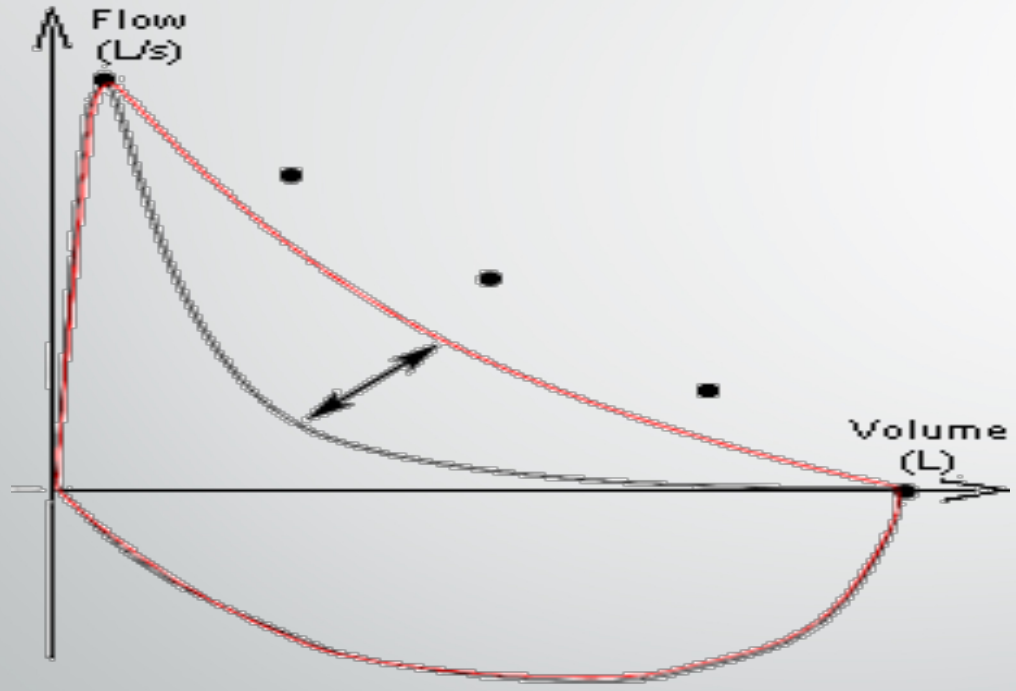




Reversibility

ASTHMA



- This is an example of airway reversibility
- Blue is prior to medication inhalation
- “scooping” of expiratory limb is c/w obstructive lung disease
- Red is after medication- NORMAL
- This reversibility is consistent with asthma
- Airflow limitation can be persistent in severe cases

Spirometry.guru

ASTHMA

Phenotypes of asthma:

Allergic asthma- common presentation/usually starts in childhood/associated with personal or family history of allergic disease. Usually eosinophilic constipation

Non allergic asthma- can be neutrophilic or eosinophilic or paucicellular

Adult onset asthma- more common in women, usually non allergic

ASTHMA

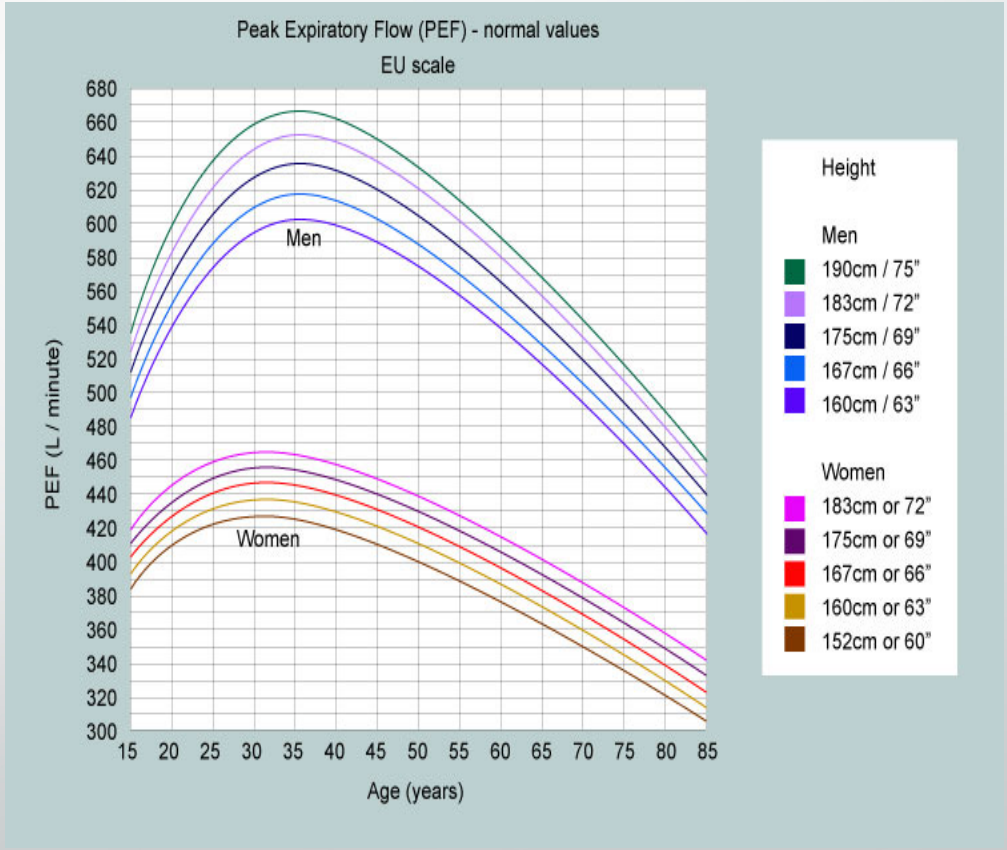
- History of variable respiratory symptoms
  - More than 1 type of symptom
  - Variable symptom severity
  - Worse at night or with waking
  - Triggered by allergens, exercise, cold air
  - Appear or worsen with viral illness

Confirmed variable airflow limitation (can be PFTS or peak flow)

- Improved FEV1 of > 12% and 200 cc in adults
- PEF variability over 2 weeks > 10% in adults, > 13% in children
- Improved lung function with 4 weeks tx
- Positive exercise challenge or bronchial challenge test

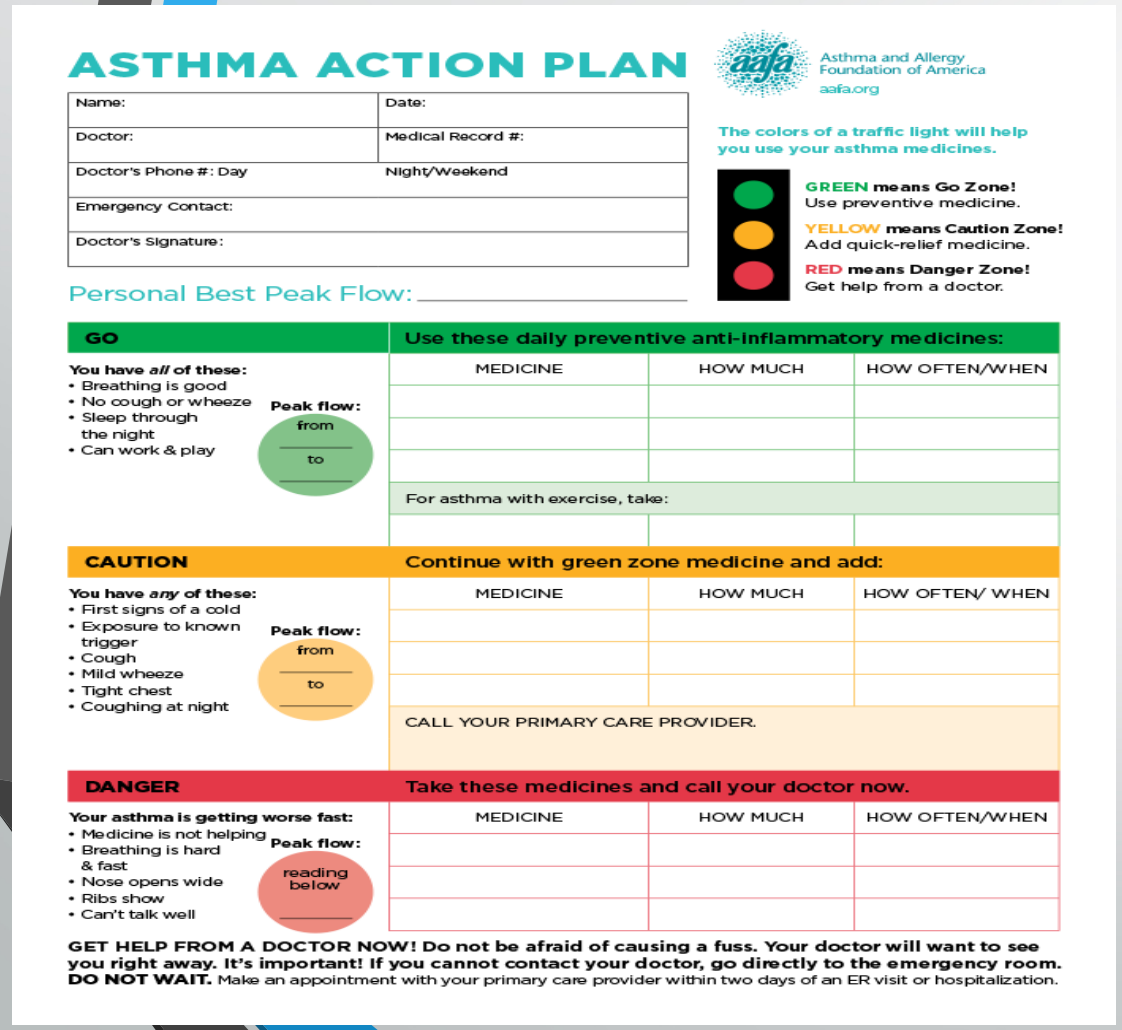
ASTHMA

Peak Expiratory Flow Device



Since PFT availability can be limited in some countries, WHO suggests use of PEF to evaluate patients.

ASTHMA



ASTHMA ACTION PLAN

Asthma and Allergy Foundation of America
aafa.org

Name:	Date:
Doctor:	Medical Record #:
Doctor's Phone #: Day	Night/Weekend
Emergency Contact:	
Doctor's Signature:	

Personal Best Peak Flow: _____

The colors of a traffic light will help you use your asthma medicines.

GREEN means Go Zone! Use preventive medicine.

YELLOW means Caution Zone! Add quick-relief medicine.

RED means Danger Zone! Get help from a doctor.

GO — Use these daily preventive anti-inflammatory medicines:

You have *all* of these:
- Breathing is good
- No cough or wheeze
- Sleep through the night
- Can work & play

Peak flow: from ____ to ____

MEDICINE	HOW MUCH	HOW OFTEN/WHEN
For asthma with exercise, take:		

CAUTION — Continue with green zone medicine and add:

You have *any* of these:
- First signs of a cold
- Exposure to known trigger
- Cough
- Mild wheeze
- Tight chest
- Coughing at night

Peak flow: from ____ to ____

MEDICINE	HOW MUCH	HOW OFTEN/ WHEN
CALL YOUR PRIMARY CARE PROVIDER.		

DANGER — Take these medicines and call your doctor now.

Your asthma is getting worse fast:
- Medicine is not helping
- Breathing is hard & fast
- Nose opens wide
- Ribs show
- Can't talk well

Peak flow: reading below ____

MEDICINE	HOW MUCH	HOW OFTEN/WHEN

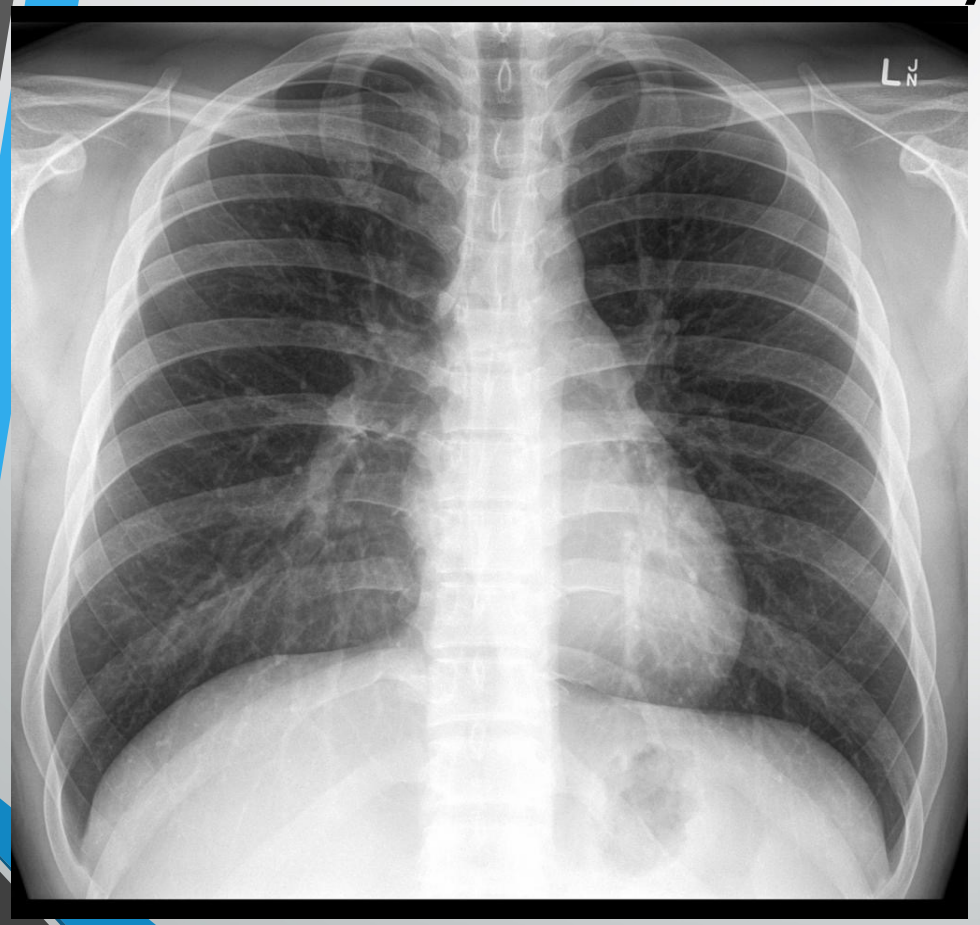
GET HELP FROM A DOCTOR NOW! Do not be afraid of causing a fuss. Your doctor will want to see you right away. It's important! If you cannot contact your doctor, go directly to the emergency room. DO NOT WAIT. Make an appointment with your primary care provider within two days of an ER visit or hospitalization.

- Involves use of peak flow meter
- Adults- diurnal PEF variability > 10% is significant
- Children- PEF variability > 13% is significant

ASTHMA

- **Green Zone**: 80 to 100 percent of your usual or "normal" peak flow rate signals **all clear**. A reading in this zone means that your asthma is in good control. Keep using the medicines as directed.
- **Yellow Zone**: 50 to 80 percent of your usual or "normal" peak flow rate signals **caution**. This zone indicates that your airways are narrowing, and you need to take action. Take the additional medicine(s) listed in the yellow zone of your asthma action plan. Call your doctor and let them know.
- **Red Zone**: Less than 50 percent of your usual or "normal" peak flow rate signals a **medical alert**. This zone indicates that there is severe airway narrowing. Take your quick-relief medicine right away. Contact your healthcare provider right away and if symptoms don’t improve, call 911 or go the nearest emergency room.

ASTHMA



ASTHMA

ASTHMA

HOW IS YOUR PATIENT DOING?

CONTROL

1. Assess symptom control over last 4 weeks (numerical tools can be used)
2. Identify risk factors for exacerbations
3. Measure lung function at diagnosis then with addition of therapy, then periodically

TREATMENT ISSUES

1. Document treatment step
2. Watch inhaler use
3. Confirm written action plan
4. **Ask about goals for asthma and medication**

COMORBIDITIES

1. Rhinitis, GERD, OSA, depression, anxiety can all contribute to symptoms, poor quality of life and even poor asthma control

Asthma Control Test™ (ACT)

1. In the past **4 weeks**, how much of the time did your **asthma** keep you from getting as much done at work, school or at home?

All of the time	1	Most of the time	2	Some of the time	3	A little of the time	4	None of the time	5

2. During the past **4 weeks**, how often have you had shortness of breath?

More than once a day	1	Once a day	2	3 to 6 times a week	3	Once or twice a week	4	Not at all	5

3. During the past **4 weeks**, how often did your **asthma** symptoms (wheezing, coughing, shortness of breath, chest tightness or pain) wake you up at night or earlier than usual in the morning?

4 or more nights a week	1	2 or 3 nights a week	2	Once a week	3	Once or twice	4	Not at all	5

4. During the past **4 weeks**, how often have you used your rescue inhaler or nebulizer medication (such as albuterol)?

3 or more times per day	1	1 or 2 times per day	2	2 or 3 times per week	3	Once a week or less	4	Not at all	5

5. How would you rate your **asthma** control during the **past 4 weeks**?

Not controlled at all	1	Poorly controlled	2	Somewhat controlled	3	Well controlled	4	Completely controlled	5

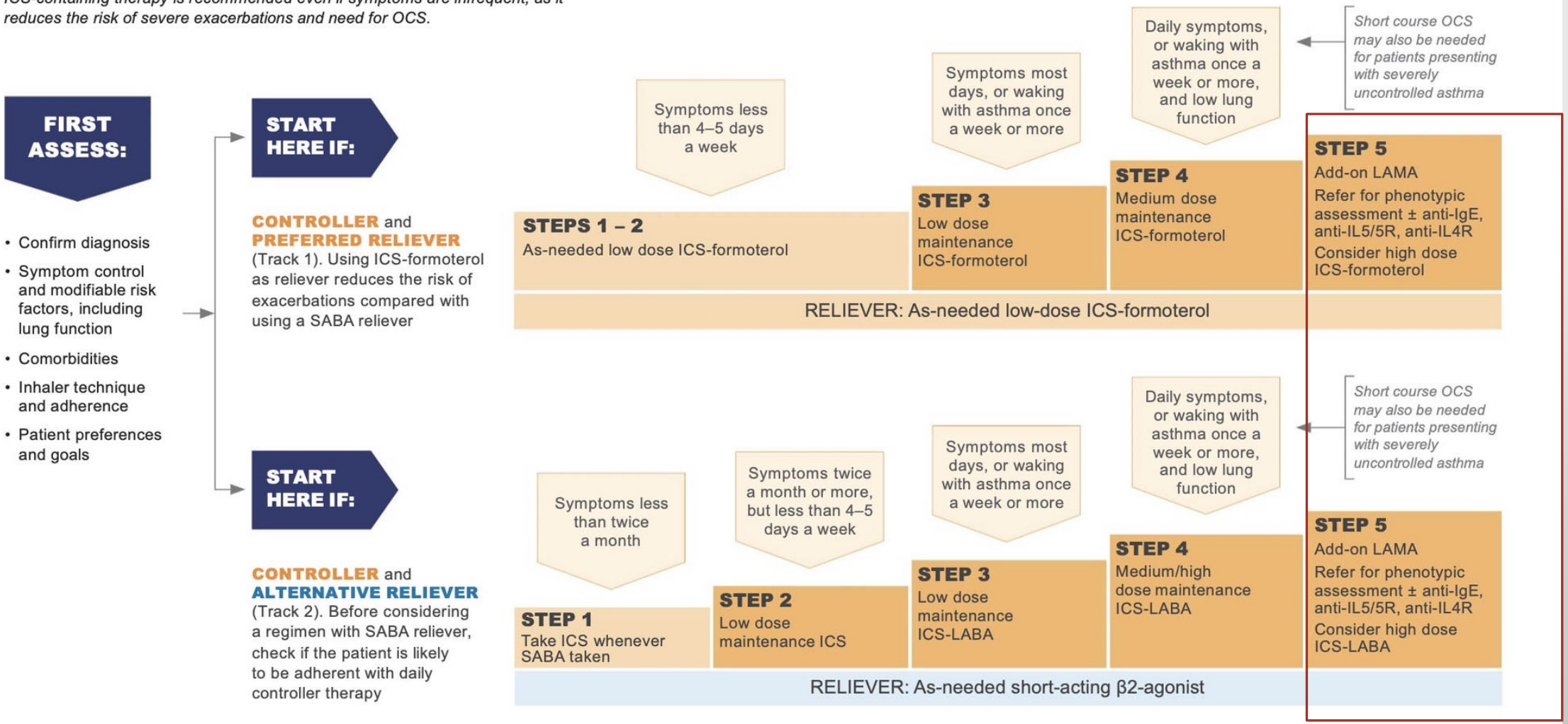
SCORE
TOTAL

Score of 19 or less indicates suboptimal control

STARTING TREATMENT

in adults and adolescents with a diagnosis of asthma

Track 1 is preferred if the patient is likely to be poorly adherent with daily controller ICS-containing therapy is recommended even if symptoms are infrequent, as it reduces the risk of severe exacerbations and need for OCS.



GINA 2021, Box 3-4Bi

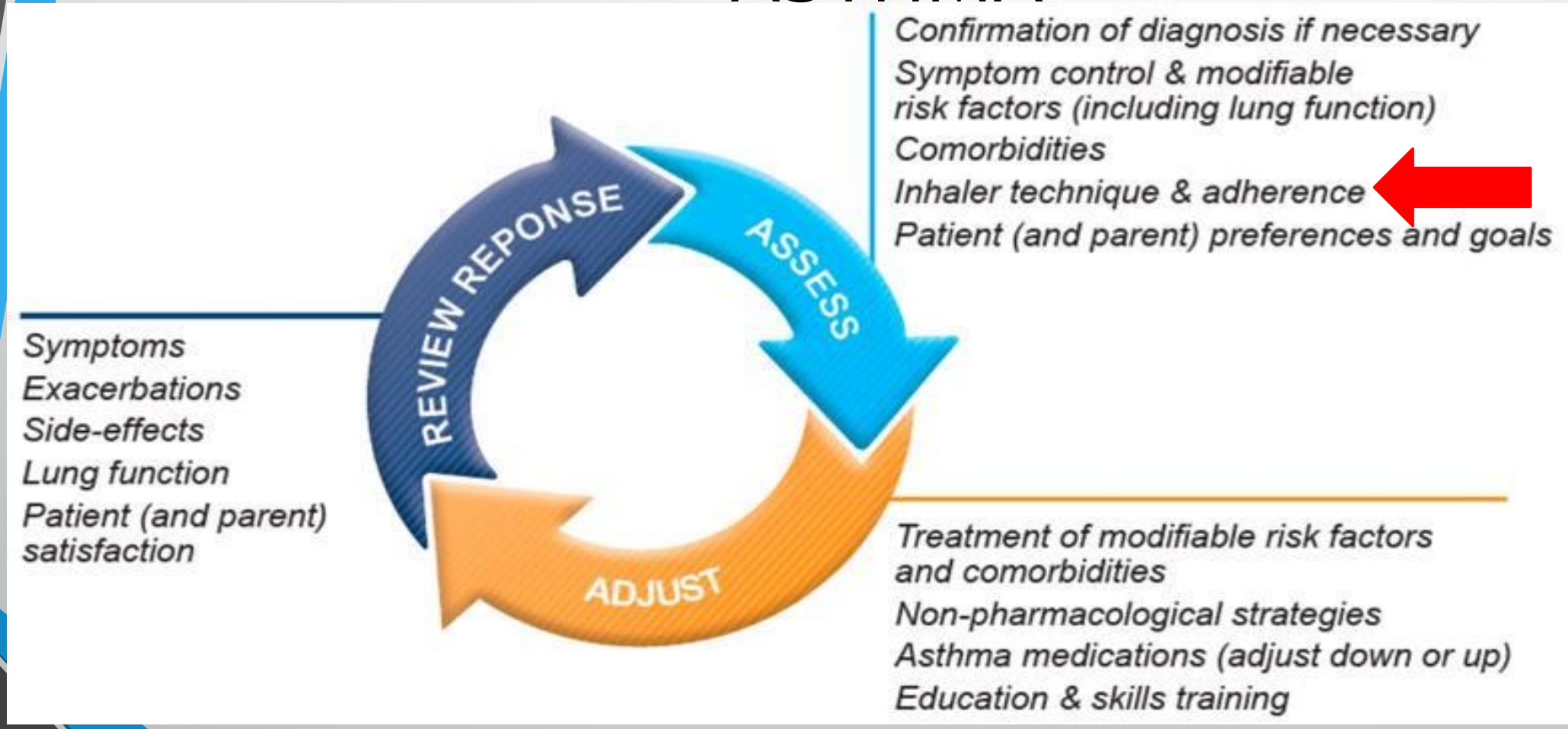
Any thing beyond high dose ICS LABA- consult a specialist

ASTHMA

What to do at STEP 5:

- Can do high dose ICS/LABA
- Add on a LAMA (long acting anti muscarinic)
- Add azithro 3X/week- after specialist referral
- Add on biologic therapy
- Low dose steroids if no other options

ASTHMA


Confirmation of diagnosis if necessary
Symptom control & modifiable risk factors (including lung function)
Comorbidities
Inhaler technique & adherence
Patient (and parent) preferences and goals
ASSESS
ADJUST
REVIEW REPONSE
Symptoms
Exacerbations
Side-effects
Lung function
Patient (and parent) satisfaction
Treatment of modifiable risk factors and comorbidities
Non-pharmacological strategies
Asthma medications (adjust down or up)
Education & skills training

ASTHMA

NSAID exacerbated respiratory disease (NERD)

- Frequently noted to be aspirin induced
- Prevalent in patients with both nasal polyposis and chronic sinusitis
- More common in patients with severe asthma
- Asthma symptoms (bronchoconstriction) typically start 20 min to 3 hrs after taking
- Cause is partly inhibition of cyclooxygenase, leading to overproduction of leukotrienes

ASTHMA

- Providers should be assessing asthma control at every appointment
- Use of inhaler and observed technique should be checked at every appointment
- Co-morbidities such as OSA, GERD, depression, anxiety should be assessed at each appointment
- Frequency of reliever inhaler dose and query on refill habits, particularly in the poorly controlled patient
- Questionnaires such as ACT (asthma control test) should be used to standardize monitoring
- Check for any medication side effects

BIOLOGIC THERAPIES FOR ASTHMA

- Anti IGE (omalizumab) for severe allergic asthma
- Anti interleukin 5/5r(subcutaneous mepolizumab ≥ age 6, IV reslizumab ≥ 18 or subcutaneous benralizumab for ≥ 12) for severe eosinophilic asthma
- Anti interleukin 4R(subcutaneous dupilumab) for patients with severe eosinophilic/Type 2 asthma or for adults requiring oral steroids

ASTHMA

Additional therapies to consider:

- Allergen immunotherapy
- Subcutaneous immunotherapy or Sublingual immunotherapy
- Routine vaccinations
- Smoking cessation/ no secondhand smoke
- Encourage routine physical activity
- Avoid work exposures
- Weight reduction

COPD

- GOLD (Global Initiative for chronic obstructive Lung Disease) provides a yearly update of best practices for diagnosis and management of COPD
- Majority of my review is from the 2023 report
- goldcopd.org

COPD UPDATE

- 384 million cases of COPD in 2010, with global prevalence of 11.7%
- Globally, 3 million deaths annually
- Prevalence is expected to rise over the next 30 years

Jl of Global Health 2015; 5(2)
Lancet 2015; 381 (9963): 117-71
Eur Resp J 2006; 27(2): 397-412

Prevalence of COPD:

- Higher in smokers and non-smokers than never smokers
- Higher in patients $\geq$ 40 than < 40
- Men > Women

Eur Resp J ;2006 (3): 523-32

COPD UPDATE

Emphysema

- Abnormal and permanent enlargement of the airspaces distal to the terminal bronchioles that is accompanied by destruction of the airspace walls, without obvious fibrosis

Chronic Bronchitis

- Chronic productive cough for three months in each of two successive years in a patient in whom other causes of chronic cough have been excluded

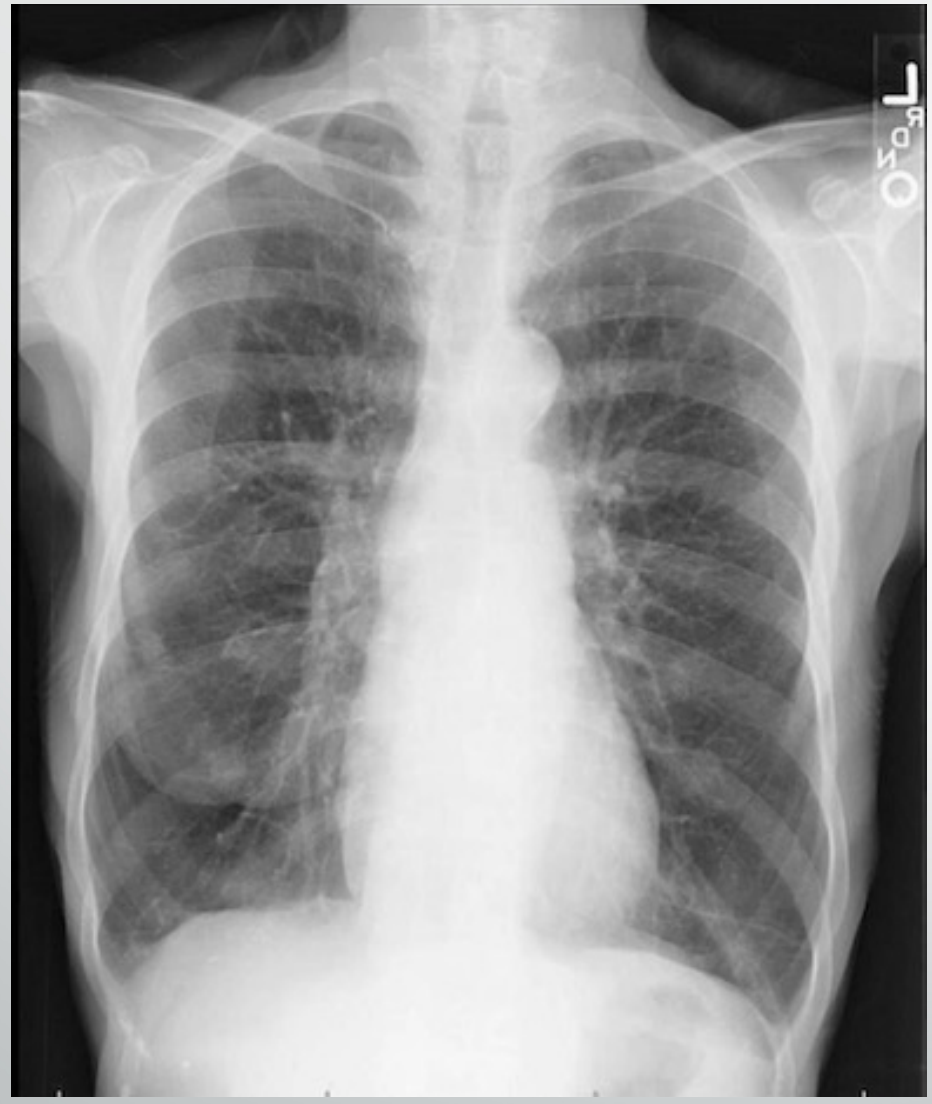
- No COPD unless airflow obstruction is present

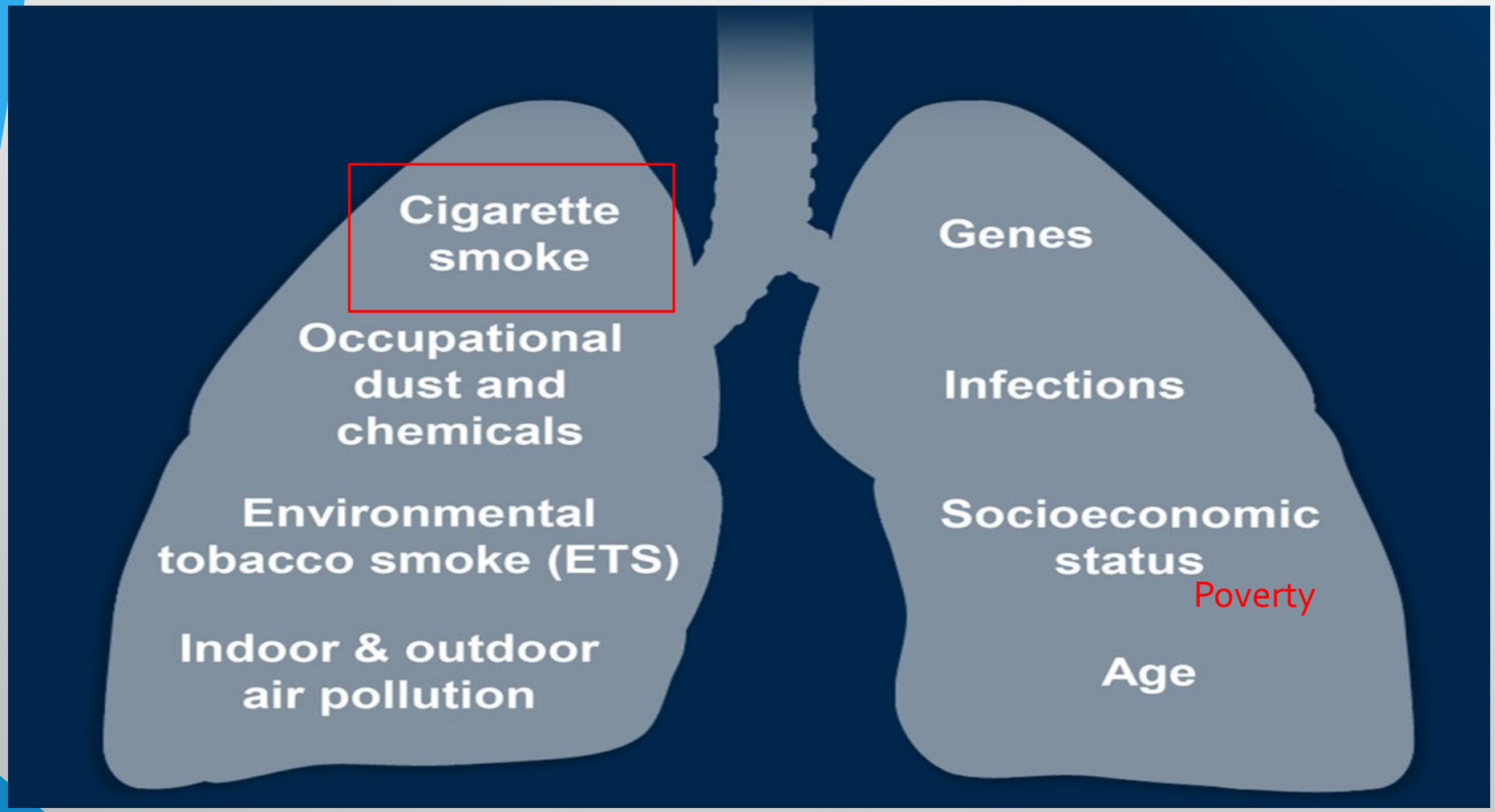
Common COPD symptoms:

- Dyspnea(most debilitating symptom)
- Cough (most frequent initial complaint)
- Sputum production
- Wheezing/chest tightness

SEVERE DISEASE:

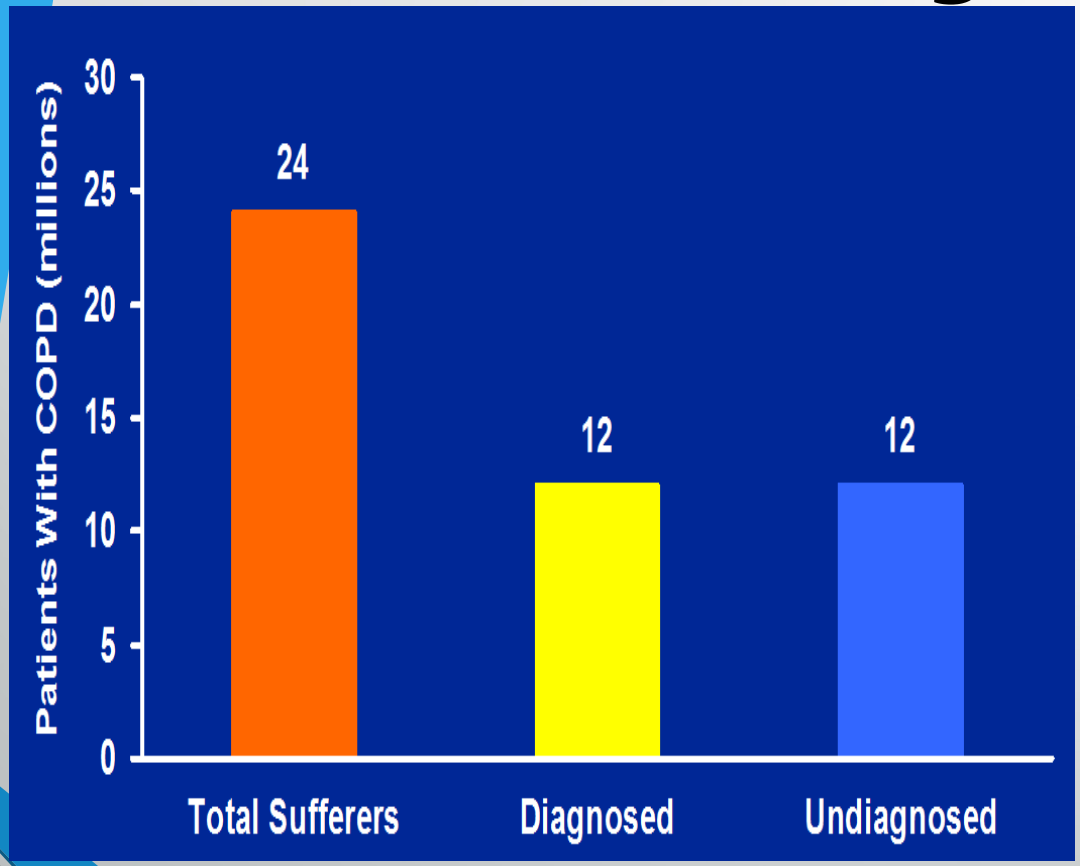
- ✓ Fatigue
- ✓ Weight loss
- ✓ Anorexia

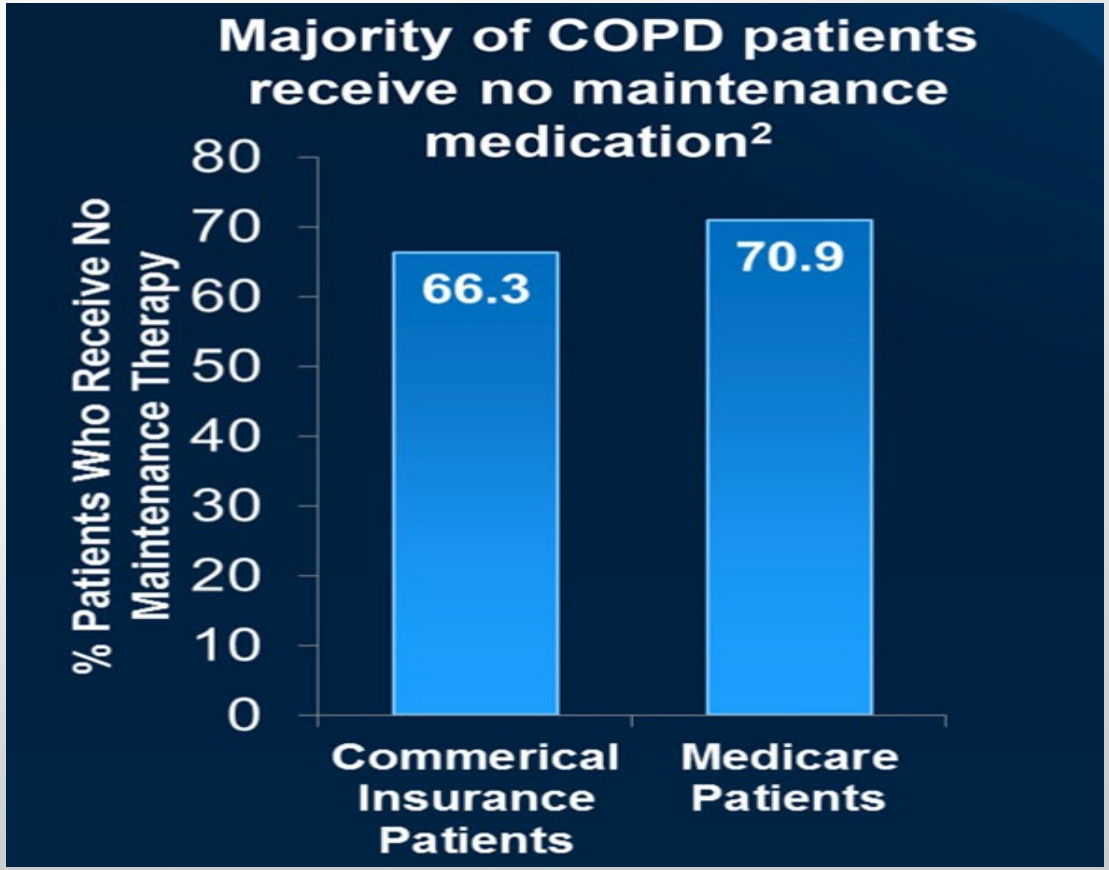




Global initiative for Chronic Obstructive Pulmonary Disease

COPD: Underdiagnosed and Undertreated





NIH, NHLBI. Morbidity and Mortality: 2009 Chartbook on Cardiovascular, Lung and Blood diseases.
Make B, et al. Int J Chron Obstruct Pulmon Dis. 2012;7:1-9.

OTHER CAUSES OF CHRONIC COUGH

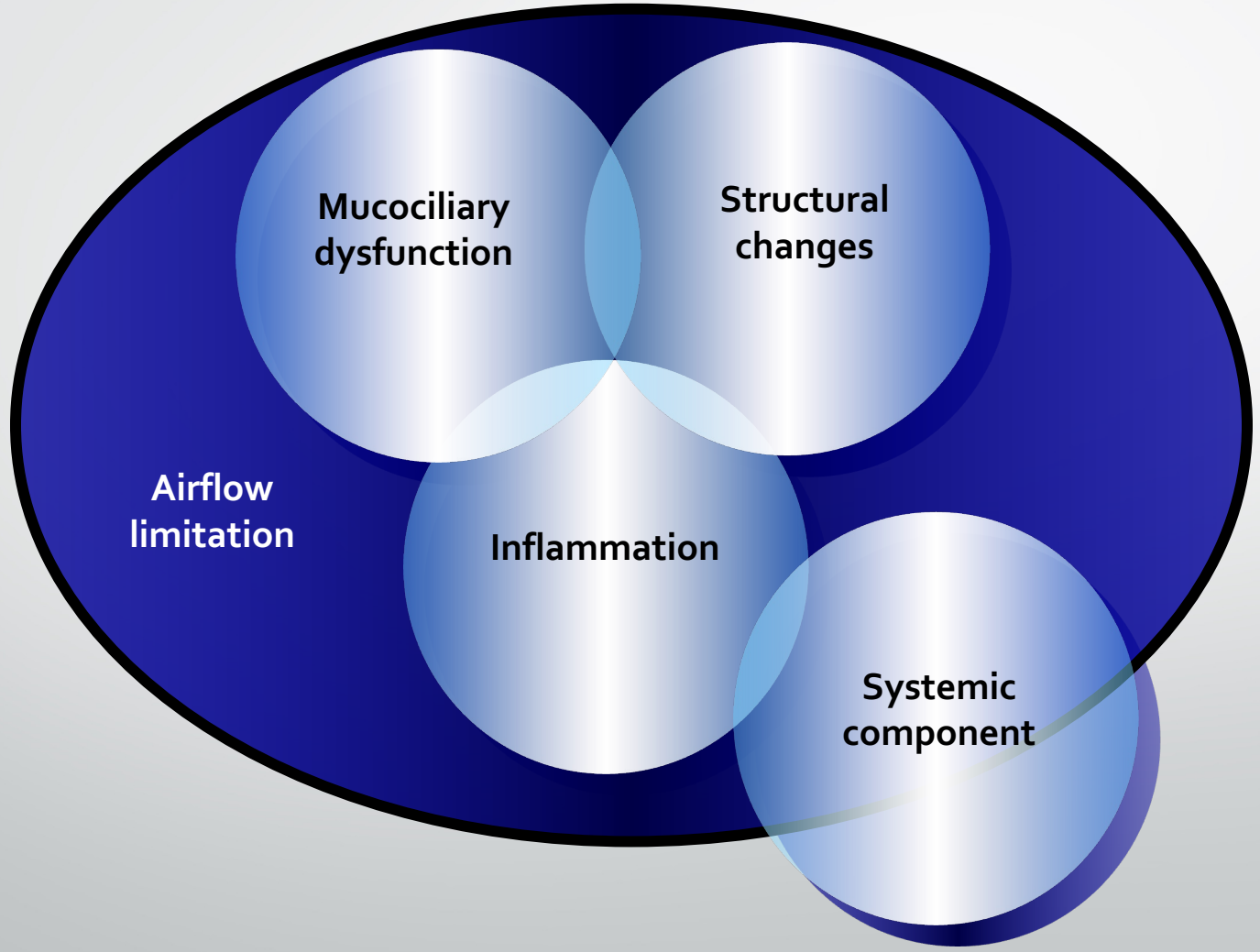
INTRATHORACIC

- Asthma
- Lung Cancer
- Tuberculosis
- Bronchiectasis
- Left Heart Failure
- Interstitial Lung Disease
- Cystic Fibrosis
- Idiopathic Cough

EXTRATHORACIC

- Chronic Allergic Rhinitis
- Post Nasal Drip Syndrome (PNDS)
- Upper Airway Cough Syndrome (UACS)
- Gastroesophageal Reflux
- Medication (e.g. ACE Inhibitors)

COPD: A Multicomponent Disease



Rodríguez-Roisin R. COPD: J COPD. 2005;2:253-262.

COPD UPDATE

$FEV_1/FVC < 0.70$ → Airflow limitation

Airflow limitation → COPD

GOLD guidelines

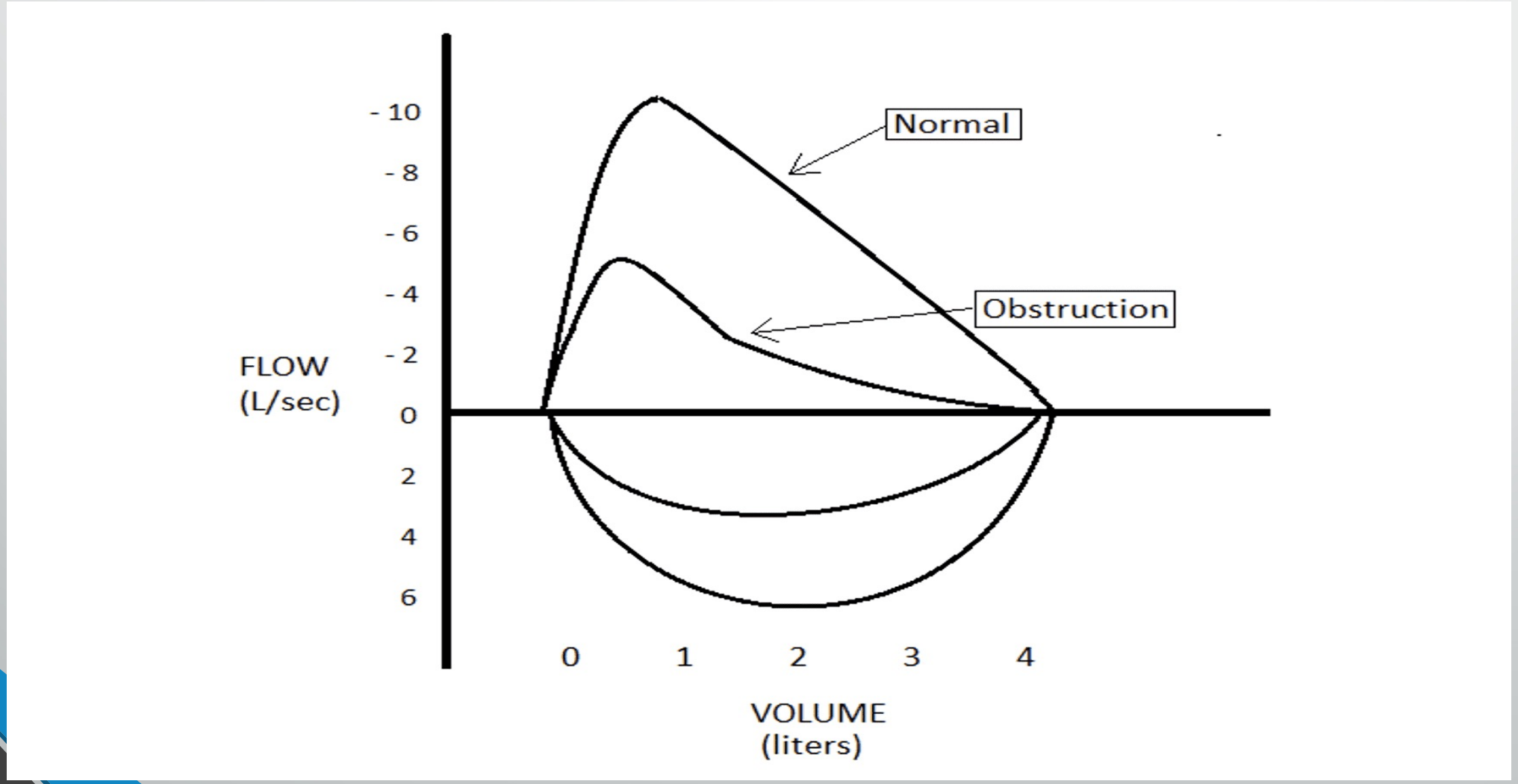
GOLD Grades and Severity of Airflow Obstruction in COPD (based on post-bronchodilator FEV1)

Table 2.6

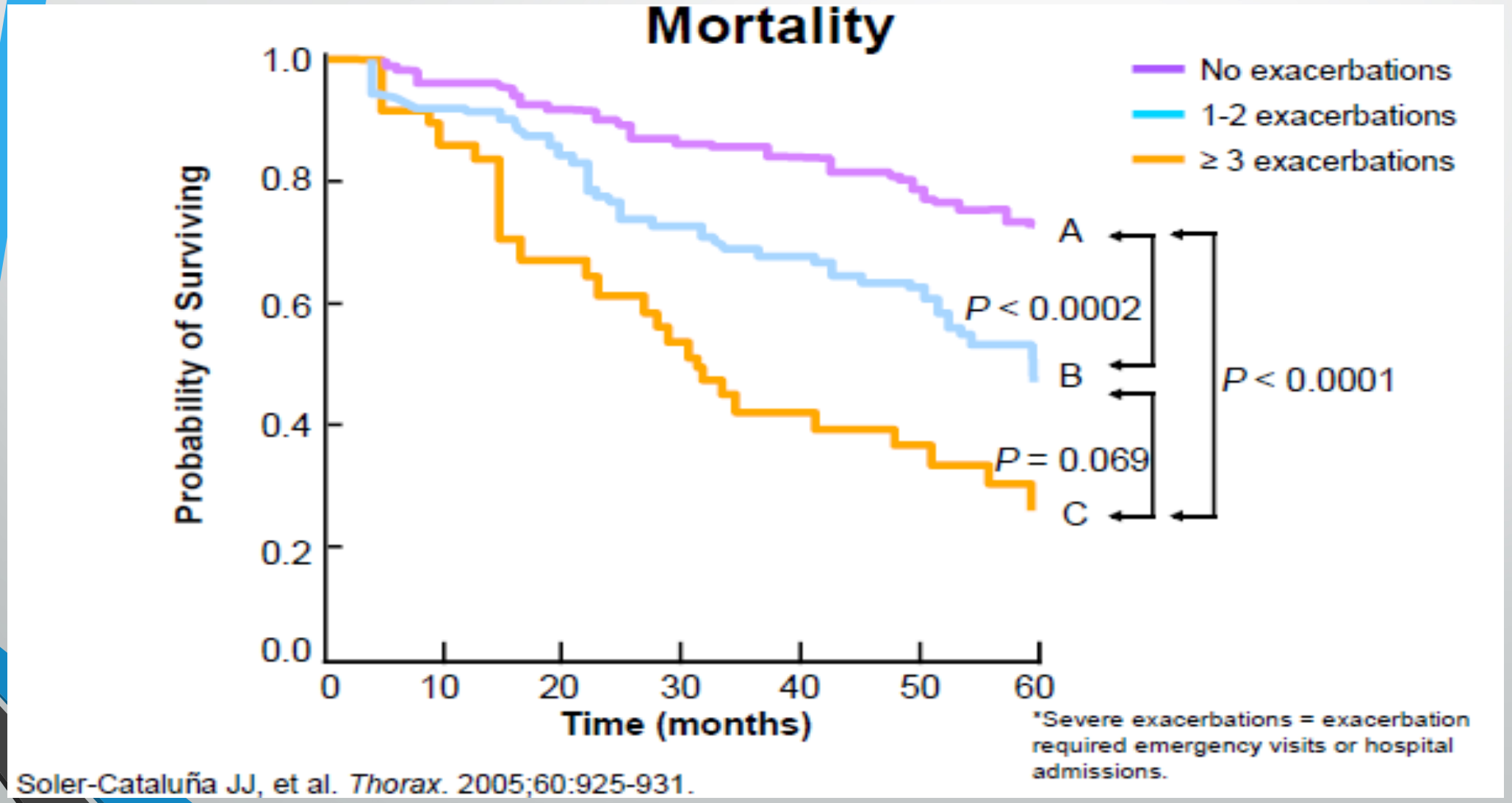
In COPD patients (FEV1/FVC < 0.7):

GOLD 1:	Mild	FEV1 ≥ 80% predicted
GOLD 2:	Moderate	50% ≤ FEV1 < 80% predicted
GOLD 3:	Severe	30% ≤ FEV1 < 50% predicted
GOLD 4:	Very Severe	FEV1 < 30% predicted

COPD UPDATE


- 10
- 8
- 6
- 4
- 2
0
2
4
6
FLOW
(L/sec)
Normal
Obstruction
0
1
2
3
4
VOLUME
(liters)

COPD UPDATE

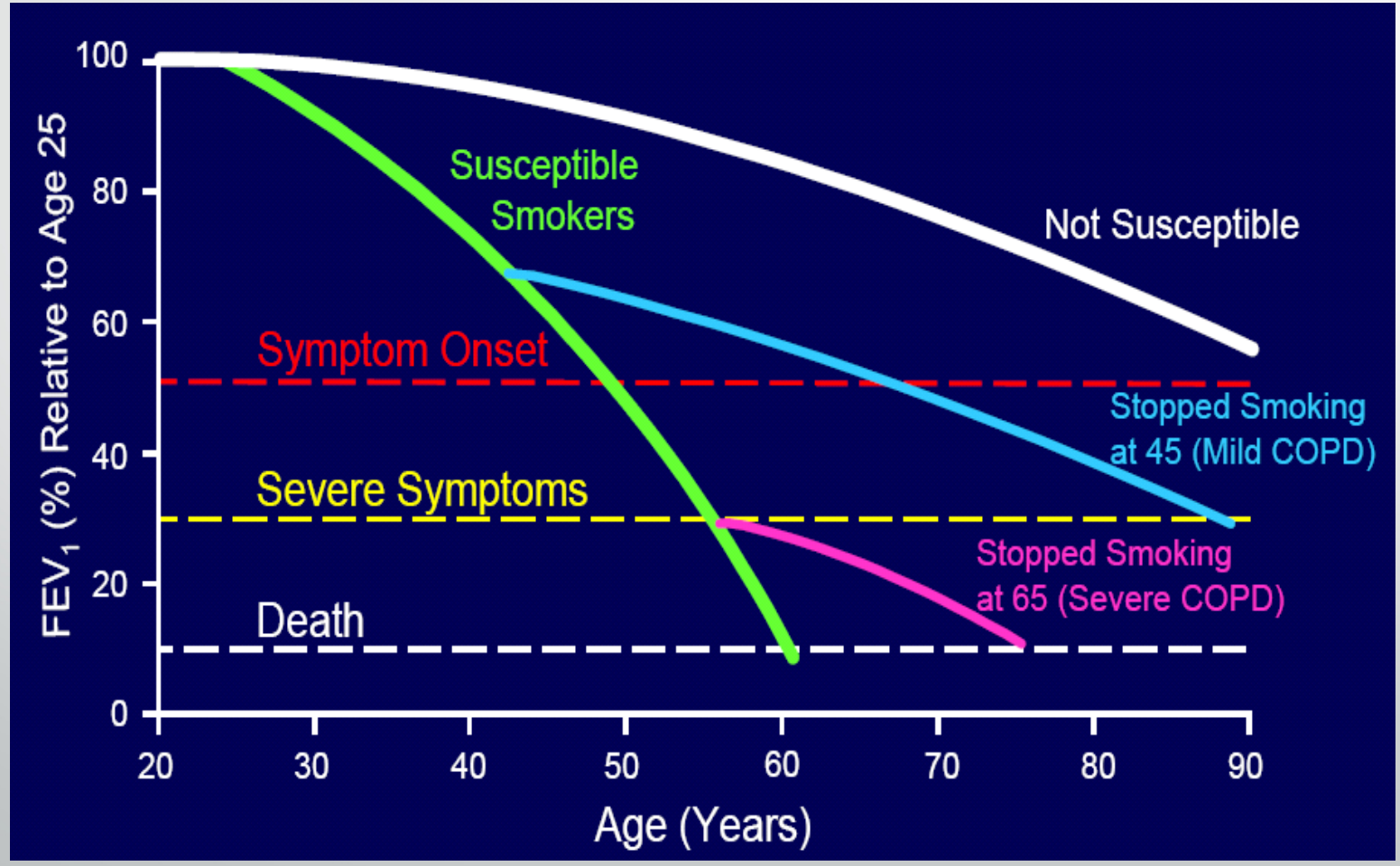


Soler-Cataluña JJ, et al. *Thorax*. 2005;60:925-931.

COPD Management Goals

- Therapies should be added in a stepwise fashion:
  - Relieve symptoms
  - Prevent disease progression
  - Improve exercise tolerance
  - Improve health status
  - Prevent and treat complications
  - Prevent and treat exacerbations
  - **Reduce mortality**

Effects of Smoking on Lung Function in COPD



Fletcher CM, Peto R. Br Med J. 1977;1:1645-1648.

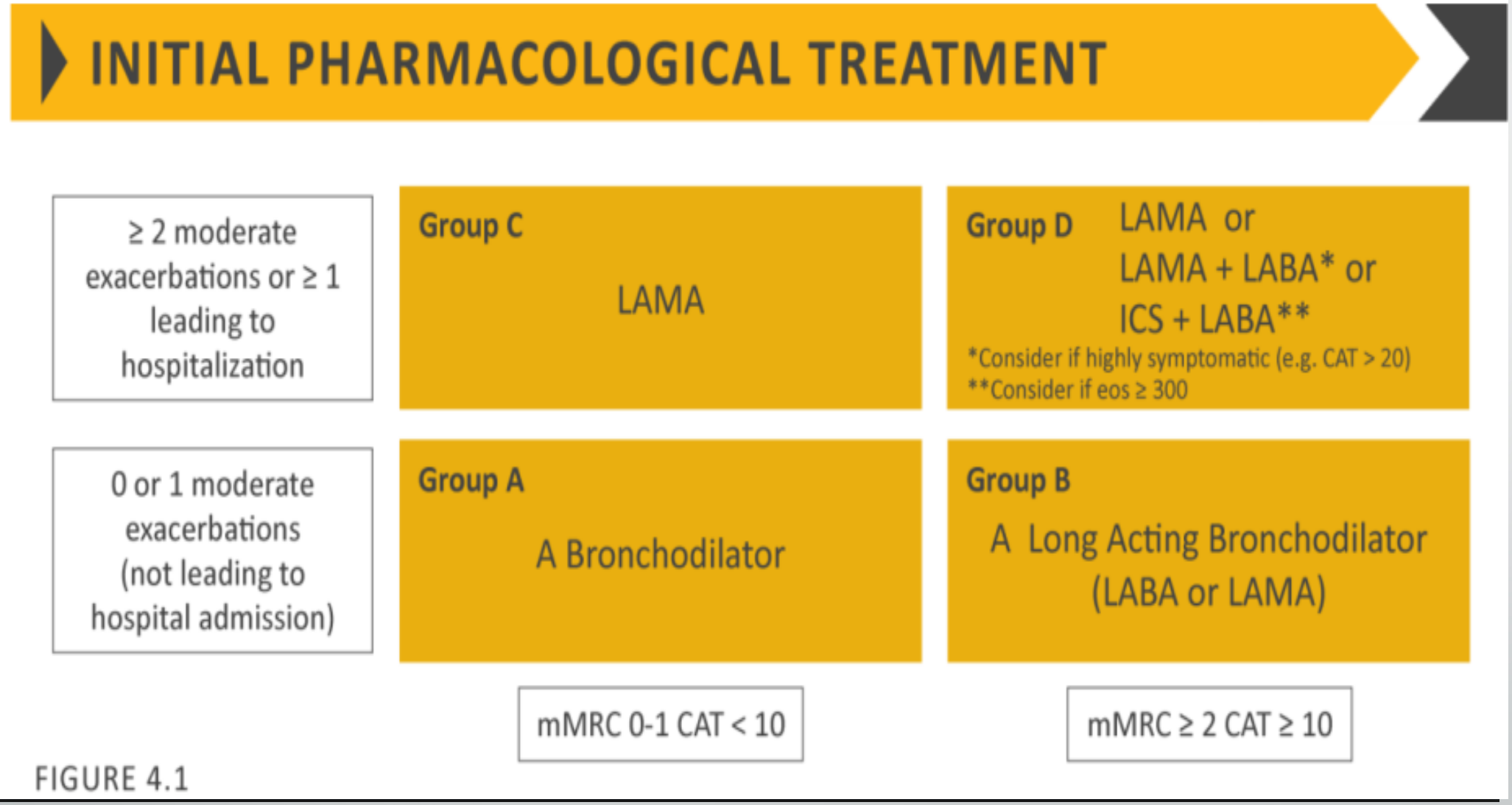


FIGURE 4.1

Short-acting bronchodilators as needed in all symptomatic patients

Bronchodilators

- Long-acting anticholinergics (LAMA) improves lung function and decrease dyspnea and exacerbations
- LAMA vs. LABA:
  - Tiotropium more effective at reducing exacerbations (OR 0.86, 95% CI 0.79-0.93)
  - No significant difference in quality of life, hospitalizations or mortality
  - Combination Tiotropium /LABA provides a slightly better quality of life and a small increase in the post bronchodilators FEV_1
- No effect on mortality

Chong J, et al. Cochrane Database Syst Rev. 2012;9:CD009157
Karner C, Cates CJ. Cochrane Database Syst Rev 2012; 4:CD008989.

Factors to Consider when Initiating ICS Treatment

Figure 3.1

Factors to consider when adding ICS to long-acting bronchodilators:

(note the scenario is different when considering ICS withdrawal)

STRONGLY FAVORS USE	History of hospitalization(s) for exacerbations of COPD[#]
	≥ 2 moderate exacerbations of COPD per year[#]
	Blood eosinophils ≥ 300 cells/µL
	History of, or concomitant asthma
FAVORS USE	1 moderate exacerbation of COPD per year[#]
	Blood eosinophils 100 to < 300 cells/µL
AGAINST USE	Repeated pneumonia events
	Blood eosinophils < 100 cells/µL
	History of mycobacterial infection

[#]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.

Inhaled Corticosteroids

- Decrease exacerbations and modestly slow the progression of respiratory symptoms
- Little impact on lung function and mortality
- Should always be used in combination with a long-acting bronchodilator in COPD
- Compared to the individual components, ICS/LABA improve lung function, health status, and the rate of exacerbations
- No difference in exacerbation rate between salmeterol/fluticasone propionate and tiotropium

Peter MA, et al. N Engl J Med 2007; 356:775-789
Wedzicha JA, et al. Am J Respir Crit Care Med. 2008;177(1):19.

BASICS IN COPD CARE AND EXACERBATION PREVENTION:

- Smoking cessation
- Appropriate immunizations- influenza, Prevnar, pneumovax.
- *Influenza vaccines* can reduce serious illness
- Pneumococcal polysaccharide vaccine is recommended for COPD patients 65 years and older and for COPD patients younger than age 65 with an $FEV_1 < 40\%$ predicted.

ATS/ERS Guidelines Standards for Diagnosis and Management of COPD 2014

BASICS IN COPD CARE AND EXACERBATION PREVENTION:

- Effectiveness and safety of e-cigarettes as a smoking cessation aid is uncertain at this time
- Inhaler technique should be assessed routinely (tailor to patient preference and abilities)
- Pulmonary rehabilitation improves symptoms, quality of life as well as ability to participate in activities

GOLD guidelines 2023

Pulmonary Rehabilitation

- Improves quality of life
- Improves independence, activities of daily living, instrumental activities of daily living
- Reduces dyspnea
- Increases exercise capacity
- May reduce mortality
- For GOLD B-D

Cambach W, et al. Arch Phys Med Rehabil. 1999;80:103-111.
Goldstein RS, et al. Lancet. 1994;344:1394-1397.
Puhan MA, et al. Respir Res 2005; 6:54.

Nutrition in COPD

- Weight loss may be observed in stable COPD
- Nutritional screening recommended
  - Body mass index (BMI) and weight change
- Weight loss defined as loss of >10% in past 6 months or >5% in past month
- Weight loss and muscle wasting contribute to morbidity, disability, and handicap

Celli, et al. Eur Respir J. 2004;23:932-946.

COPD UPDATE

PALLIATIVE CARE, END OF LIFE AND HOSPICE CARE IN COPD

- Opiates, neuromuscular electrical stimulation (NMES), oxygen and fans blowing air on to the face can relieve breathlessness **(Evidence C)**.
- In malnourished patients, nutritional supplementation may improve respiratory muscle strength and overall health status **(Evidence B)**.
- Fatigue can be improved by self-management education, pulmonary rehabilitation, nutritional support and mind-body interventions **(Evidence B)**.

COPD UPDATE

Timing of specialty consultation:

- Failure of conventional therapy
- Early age of onset of symptoms
- Age < 65 and in otherwise good physical condition
- Asymmetric radiographic findings

THANK YOU!

CAT™ ASSESSMENT

For each item below, place a mark (x) in the box that best describes you currently.
Be sure to only select one response for each question.

EXAMPLE: I am very happy	0	X	2	3	4	5	**I am very sad**	**SCORE**
I never cough	0	1	2	3	4	5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0	1	2	3	4	5	My chest is completely 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 one flight of stairs I am not breathless	0	1	2	3	4	5	When I walk up a hill or one flight of stairs I am very breathless	
I am not limited doing any activities at home	0	1	2	3	4	5	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0	1	2	3	4	5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0	1	2	3	4	5	I don't sleep soundly because of my lung condition	
I have lots of energy	0	1	2	3	4	5	I have no energy at all	

BREAKPOINT = 10

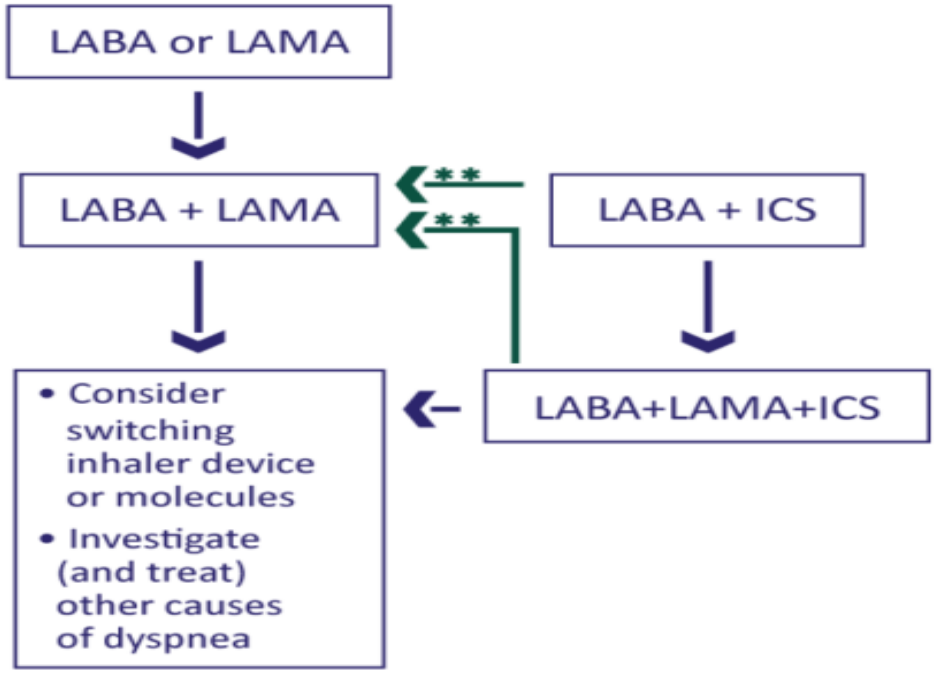
Reference: Jones et al. ERJ 2009; 34 (3); 648-54.

TOTAL SCORE:

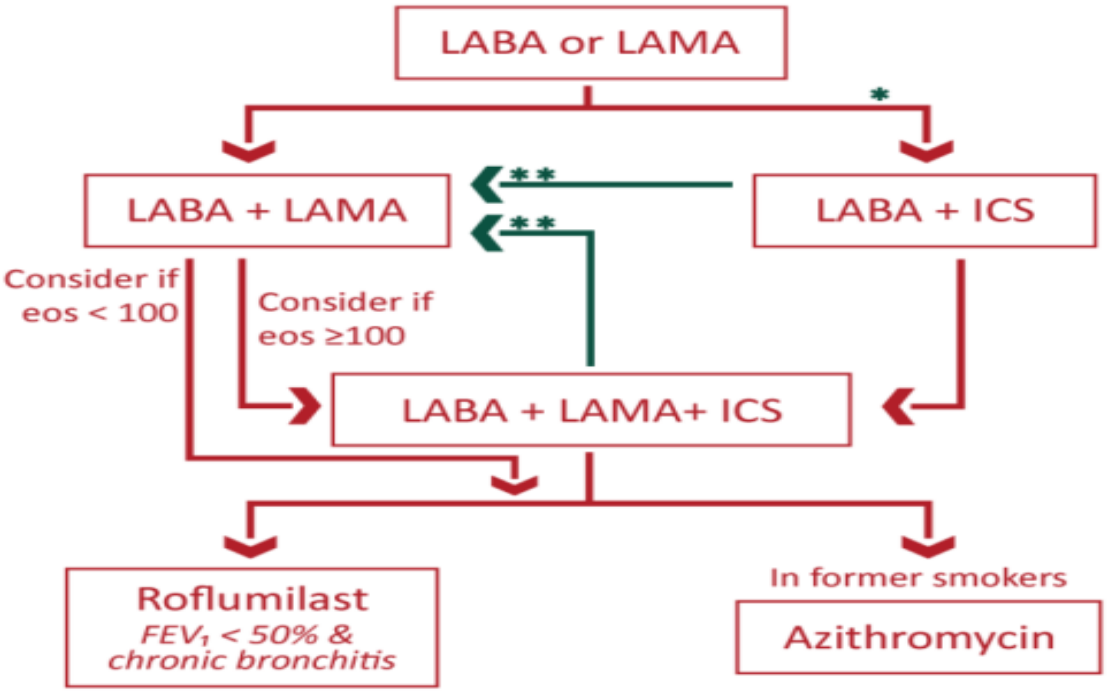
FOLLOW-UP PHARMACOLOGICAL TREATMENT

1. **IF RESPONSE TO INITIAL TREATMENT IS APPROPRIATE, MAINTAIN IT.**
2. **IF NOT:**
   - ✓ Consider the predominant treatable trait to target (dyspnea or exacerbations)
     - Use exacerbation pathway if both exacerbations and dyspnea need to be targeted
   - ✓ Place patient in box corresponding to current treatment & follow indications
   - ✓ Assess response, adjust and review
   - ✓ These recommendations do not depend on the ABCD assessment at diagnosis

• DYSPNEA •



• EXACERBATIONS •



eos = blood eosinophil count (cells/µL)

** Consider if eos ≥ 300 or eos ≥ 100 AND ≥2 moderate exacerbations / 1 hospitalization*

*** Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS*