Overview of the Latest (2025) Global Initiative for Chronic Obstructive Lung Disease Guidelines: (with) Case Studies to Ponder

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Conflict of Interest: **None**

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I have no perceived conflicts of interest and am not affiliated with any pharmaceutical, equipment, or manufacturing company.

DISCLAIMER

I am a Respiratory Therapist, not a Physician**, and will present an overview of the most current GOLD COPD Guidelines for the general clinician. The primary resource for this presentation is the most updated/recently released GOLD COPD 2025 Report.**

OBJECTIVES

1) Identify the purpose and goal of the **GOLD** guidelines for COPD
2) Discuss the assessment and diagnostic aspects of COPD
3) Categorize patients according to the **GOLD** guidelines to include treatment strategies for stable COPD and COPD exacerbations

GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE

Global Initiative for Chronic Obstructive Lung Disease

GLOBAL STRATEGY FOR THE DIAGNOSIS, MANAGEMENT, AND PREVENTION OF CHRONIC OBSTRUCTIVE PULMONARY DISEASE

National Heart, Lung, and Blood Institute

World Health Organization

GOLD was launched in 1997 in collaboration with the **National Heart, Lung, and Blood Institute**, **National Institutes of Health,** and the **World Health Organization**.

GOLD's program is determined and its guidelines for COPD care are shaped by committees made up of leading experts from around the world.

History of **GOLD**

goldcopd.org

Purpose and Goal of the GOLD Guidelines

- **Recommend** effective COPD management and prevention **strategies** for use in all countries.
- **Increase awareness** of the medical community, public health officials and the general public that COPD is a public health problem.
- **Decrease morbidity and mortality** from COPD through implementation and evaluation of effective programs for diagnosis and management.
- **Promote study** into reasons for increasing prevalence of COPD including relationship with environment.
- **Implement** effective **programs** to prevent COPD.

"...to provide a non-biased review of the current evidence..."

2025 GOLD REPORT

GLOBAL STRATEGY FOR PREVENTION, DIAGNOSIS AND MANAGEMENT OF COPD: 2025 Report

Evidence-based strategy document for COPD diagnosis, management, and prevention, with citations from the scientific literature.

View the 2025 Summary of Changes

DOWNLOAD 2025 GOLD REPORT

POCKET GUIDE TO COPD DIAGNOSIS, MANAGEMENT AND PREVENTION: 2025 Report

A quick-reference guide for physicians and nurses, with key information about patient management and education.

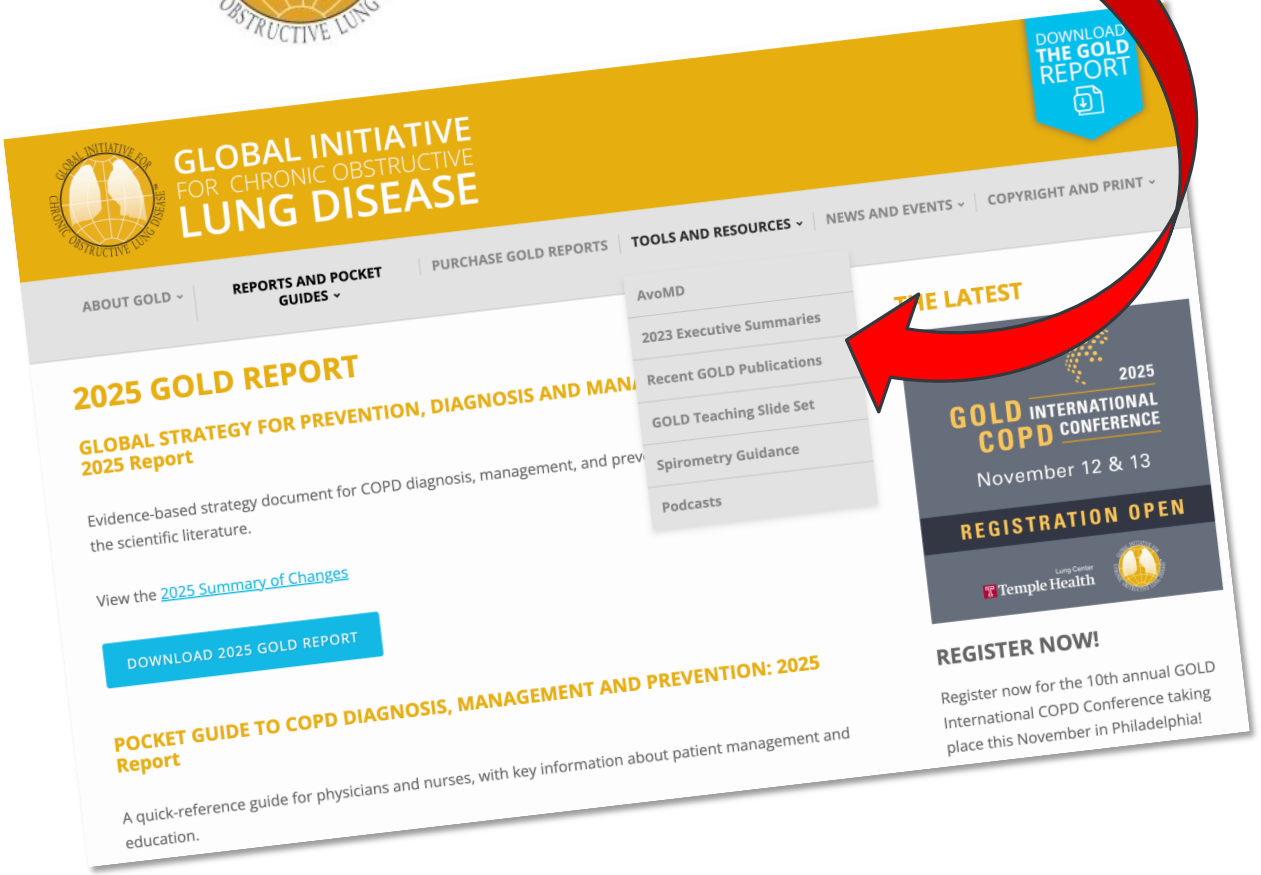
DOWNLOAD 2025 GOLD POCKET GUIDE

THE LATEST

REGISTER NOW!

Register now for the 10th annual GOLD International COPD Conference taking place this November in Philadelphia!

GOLD WEBSITE
www.goldcopd.org



GOLD 2025 Report: Chapters

1. **Definition** and Overview
2. Diagnosis and Assessment
3. Prevention & Management of COPD
4. Management of Exacerbations
5. COPD & Comorbidities

COPD

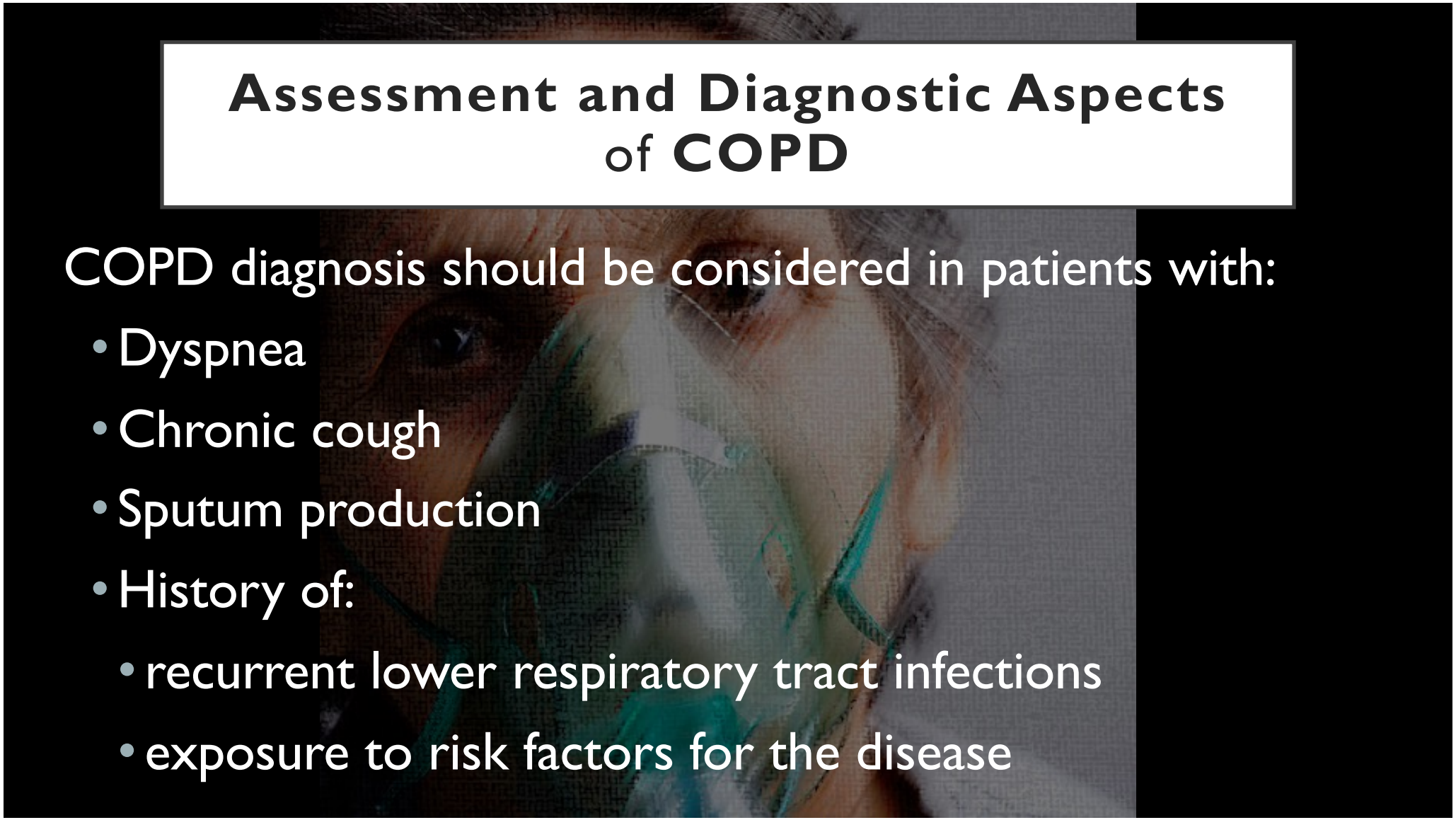
Chronic Obstructive Pulmonary Disease (COPD) is a **heterogeneous** lung condition characterized by **chronic** respiratory symptoms (dyspnea, cough, sputum production and/or exacerbations) due to **abnormalities of the airways** (bronchitis, bronchiolitis) **and/or alveoli** (emphysema) that cause persistent, often **progressive**, airflow obstruction.

(Original) Source: Celli, et al. Am J Respir Crit Care Med 2022

WHAT HAS CHANGED?

- New section on **dysbiosis** has been included
- Information on **spirometry updated**
- **CV risk in COPD** now covered
- Climate change and COPD now included
- Updated **vaccination** recommendations
- Info on delivery of **Pulmonary Rehab**: in person vs. virtual is included
- **Pulmonary hypertension** is now covered

Assessment and Diagnostic Aspects of COPD



COPD diagnosis should be considered in patients with:

- Dyspnea
- Chronic cough
- Sputum production
- History of:
  - recurrent lower respiratory tract infections
  - exposure to risk factors for the disease

Particle Inhalation

Tobacco Smoking

COPD RISK FACTORS

Accelerated Lung Aging

Genetic Variant

Abnormal Lung Development

Genetic (Rare)

SERPINA1 gene mutation

Patients with COPD-like respiratory symptoms but without airflow obstruction (FEV1/FVC ≥ 0.7 post-bronchodilation) should be labelled '**Pre-COPD**'.

The term '**PRISm**' (Preserved Ratio Impaired Spirometry) has been proposed to identify those with normal ratio but abnormal spirometry.

Patients with Pre-COPD or PRISm are at risk of developing airflow obstruction over time, but not all of them do.

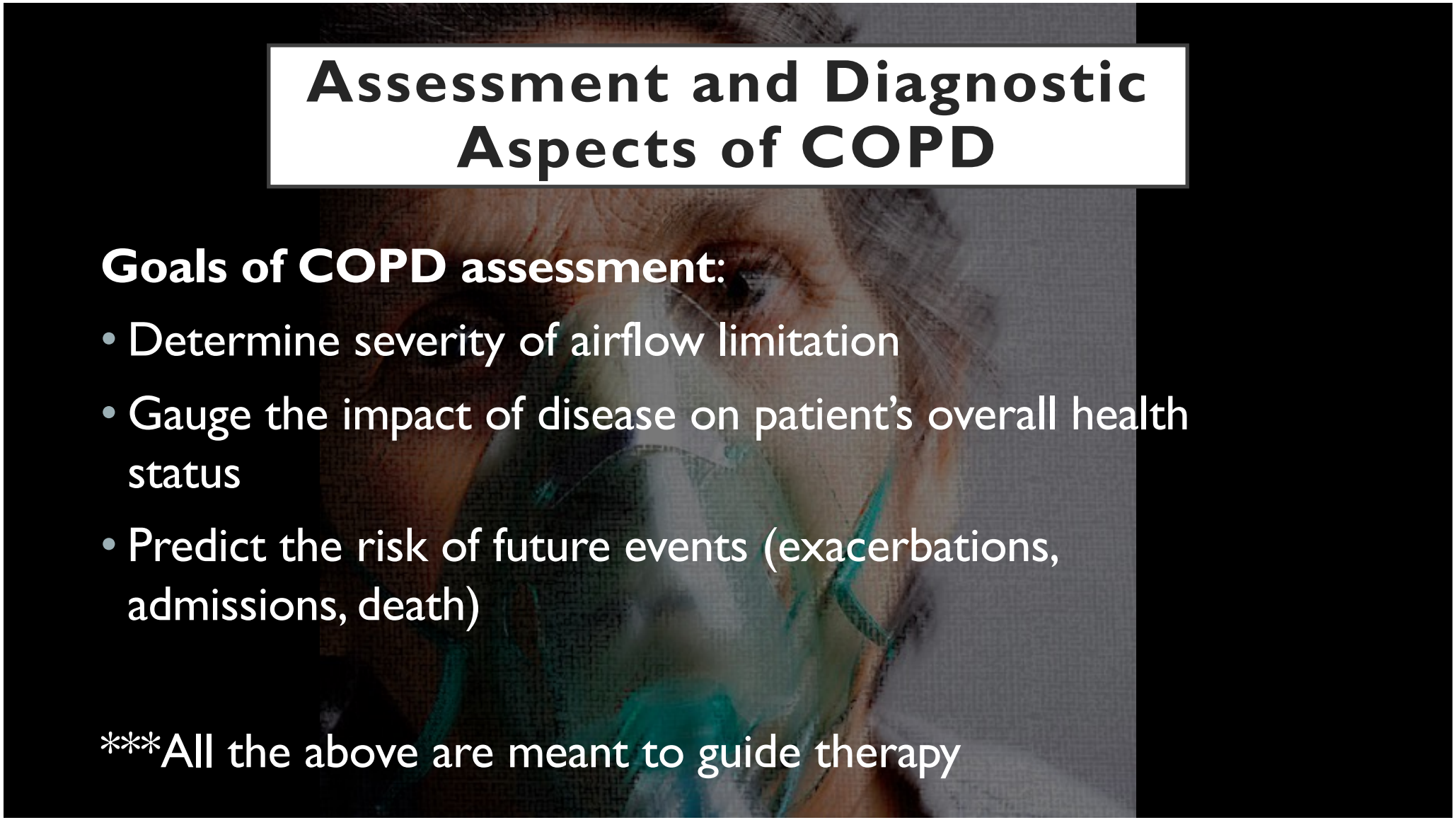
NEWER DIAGNOSTIC CRITERIA

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

Figure 2.8

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



Assessment and Diagnostic Aspects of COPD

Goals of COPD assessment:

- Determine severity of airflow limitation
- Gauge the impact of disease on patient's overall health status
- Predict the risk of future events (exacerbations, admissions, death)

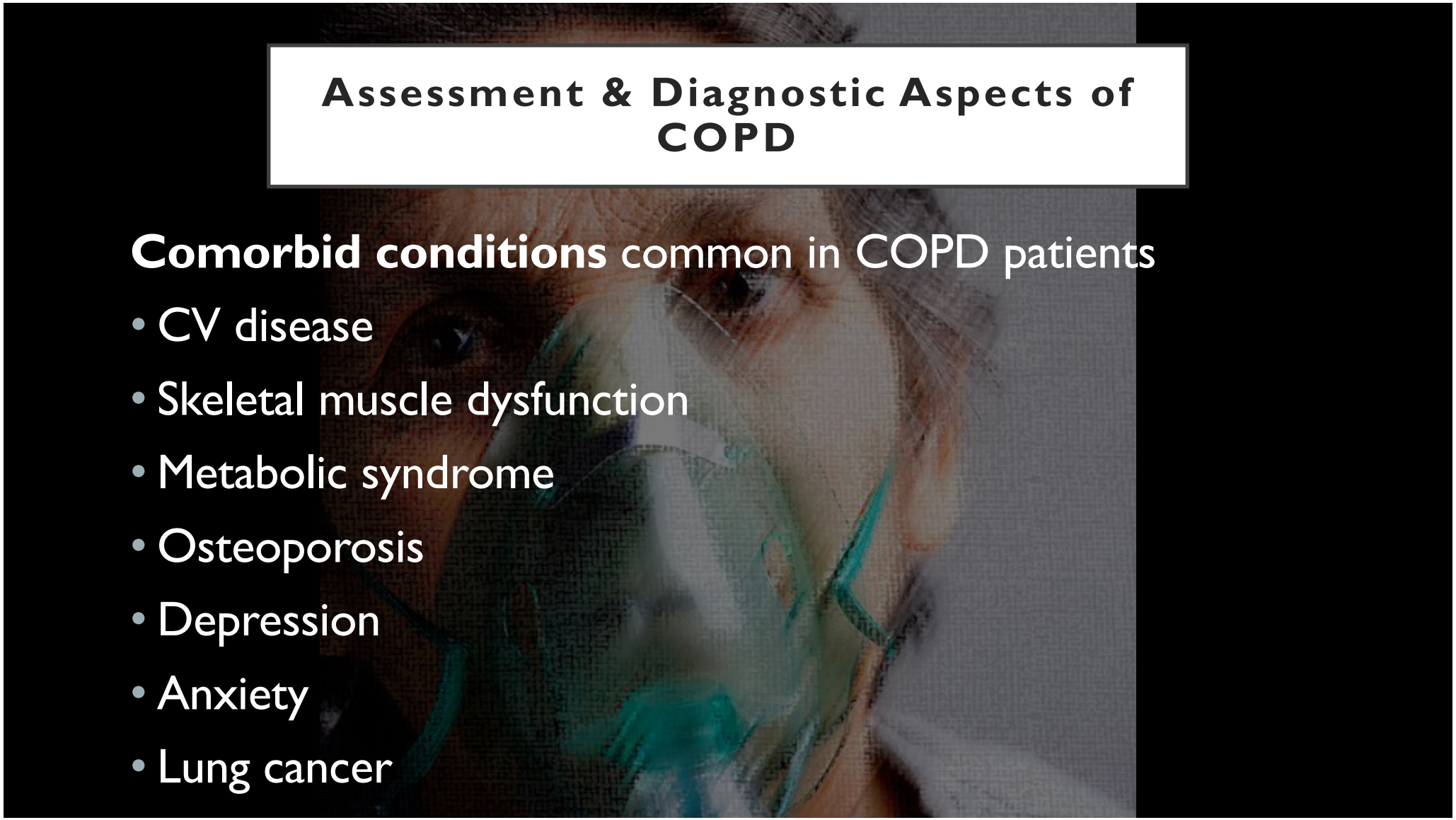
***All the above are meant to guide therapy

COPD

"...the end-result of complex, cumulative and dynamic **gene-environment interactions** over the lifetime that can damage the lungs and/or alter their normal developmental of aging processes."

Lancet Respir Med 2022; 10(5)

Assessment & Diagnostic Aspects of COPD



Comorbid conditions common in COPD patients

- CV disease
- Skeletal muscle dysfunction
- Metabolic syndrome
- Osteoporosis
- Depression
- Anxiety
- Lung cancer

Modified MRC Dyspnea Scale

Figure 2.9

PLEASE TICK IN THE BOX THAT APPLIES TO YOU | ONE BOX ONLY | Grades 0 - 4

mMRC Grade 0	mMRC Grade 1	mMRC Grade 2	mMRC Grade 3	mMRC Grade 4
I only get breathless with strenuous exercise	I get short of breath when hurrying on the level or walking up a slight hill	I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level	I stop for breath after walking about 100 meters or after a few minutes on the level	I am too breathless to leave the house or I am breathless when dressing or undressing
☐	☐	☐	☐	☐

Reference: ATS (1982) Am Rev Respir Dis. Nov;126(5):952-6.

CAT™ Assessment

Figure 2.10

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.

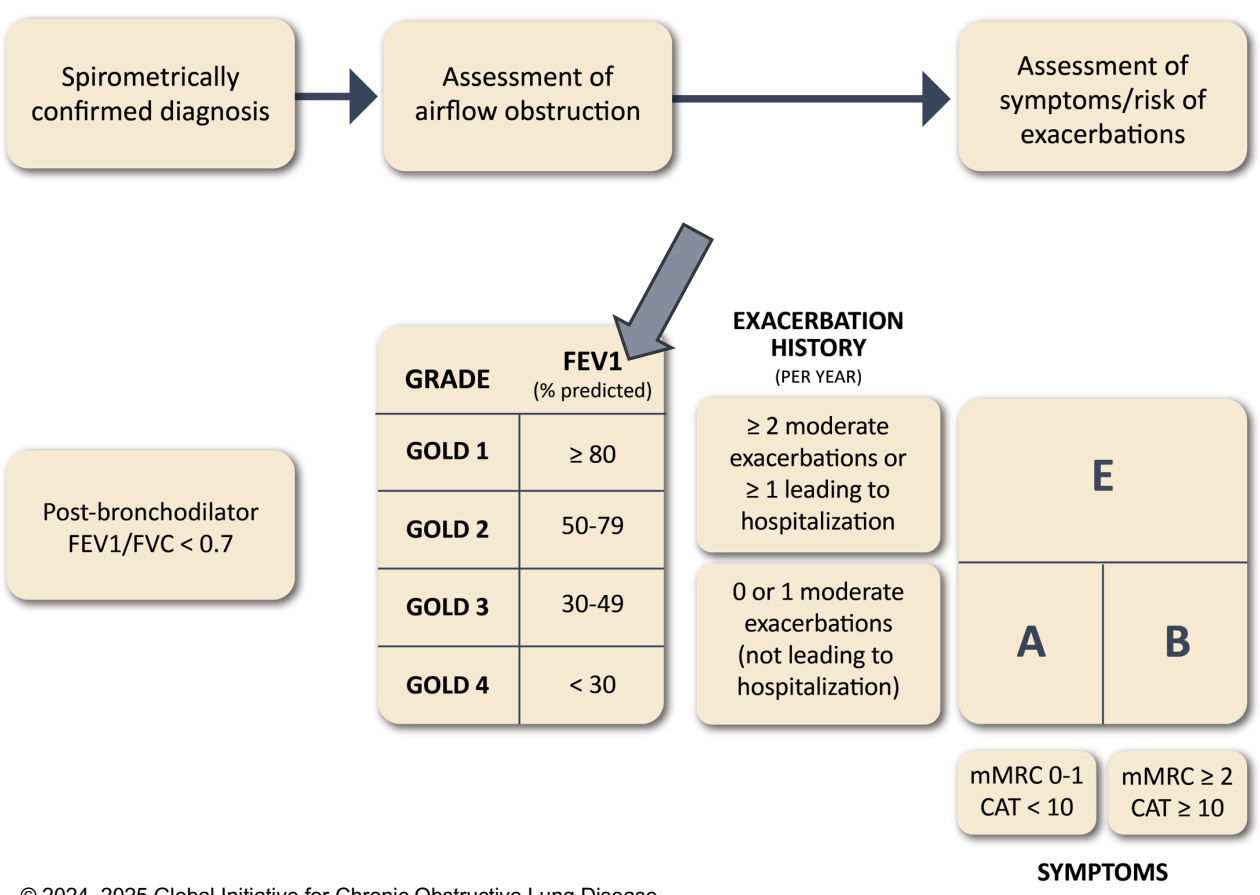
EXAMPLE: I am very happy	0 X 2 3 4 5	I am very sad	Score
I never cough	0 1 2 3 4 5	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 2 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 3 4 5	My chest feels very tight	
When I walk up a hill 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	

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

TOTAL SCORE:

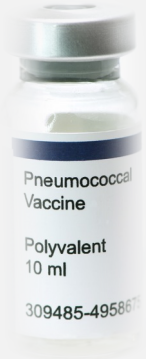
GOLD ABE Assessment Tool

Figure 2.11



Use of GOLD Guidelines for Maximum Quality of Life

- Smoking cessation (pharmacotherapy, NRT)
- Pharmacological therapy
  - Individualized, guided by symptom severity and exacerbation risk
  - Assess inhaler technique regularly
- COVID-19 *vaccination*
- Influenza *vaccination*
- Pneumococcal *vaccination*
- Pulmonary rehabilitation



Other GOLD Guidelines for Maximum Quality of Life

For Select Patients Only

- Long-term oxygen therapy
- Long-term non-invasive ventilation
- Surgical or bronchoscopic interventional treatments
- Palliative approaches

GOLD-recommended Treatment Strategies for Stable COPD

KEY POINTS:

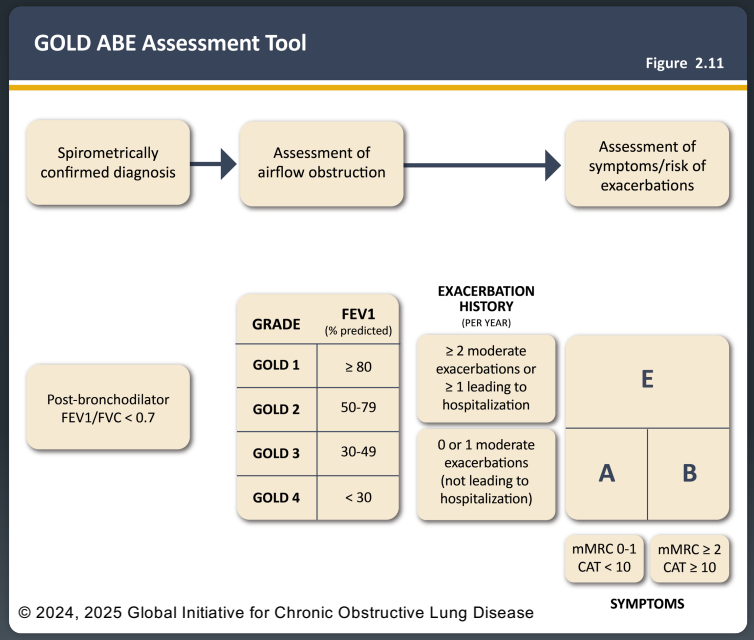
*For stable COPD, based on **individualized assessment** of symptoms and future risk of exacerbations

**All who smoke should be strongly encouraged and supported to quit

***Main treatment goals = **reduce symptoms and future exacerbation risk**

***Management strategies are not limited to pharmacologic treatments – should be complemented by appropriate non-pharmacologic interventions

A B E Classification *Summary*



A – low symptoms, low risk

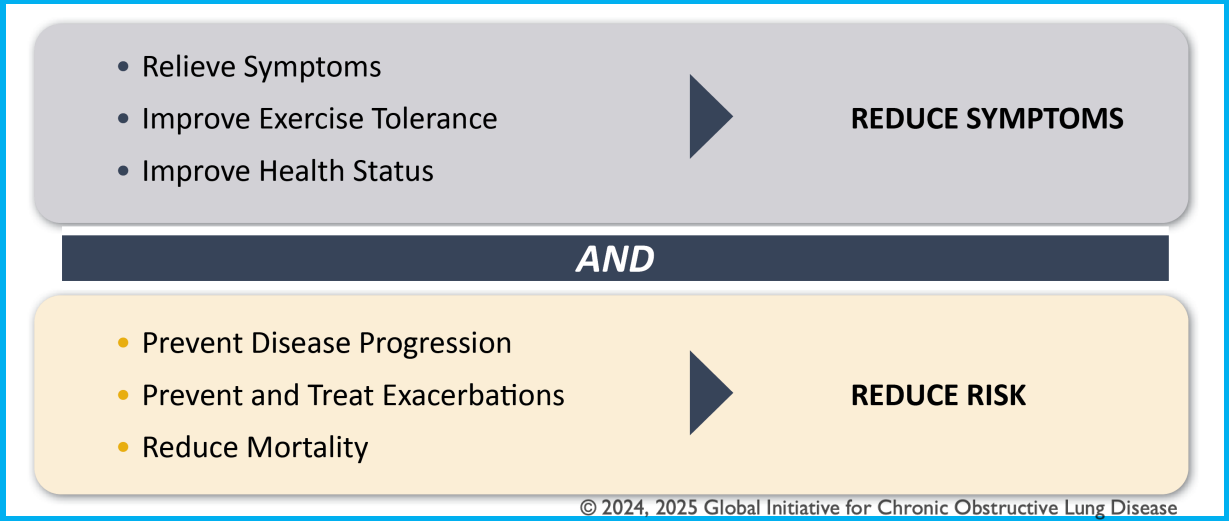
B – more symptoms, more risk

E – exacerbation risk is high

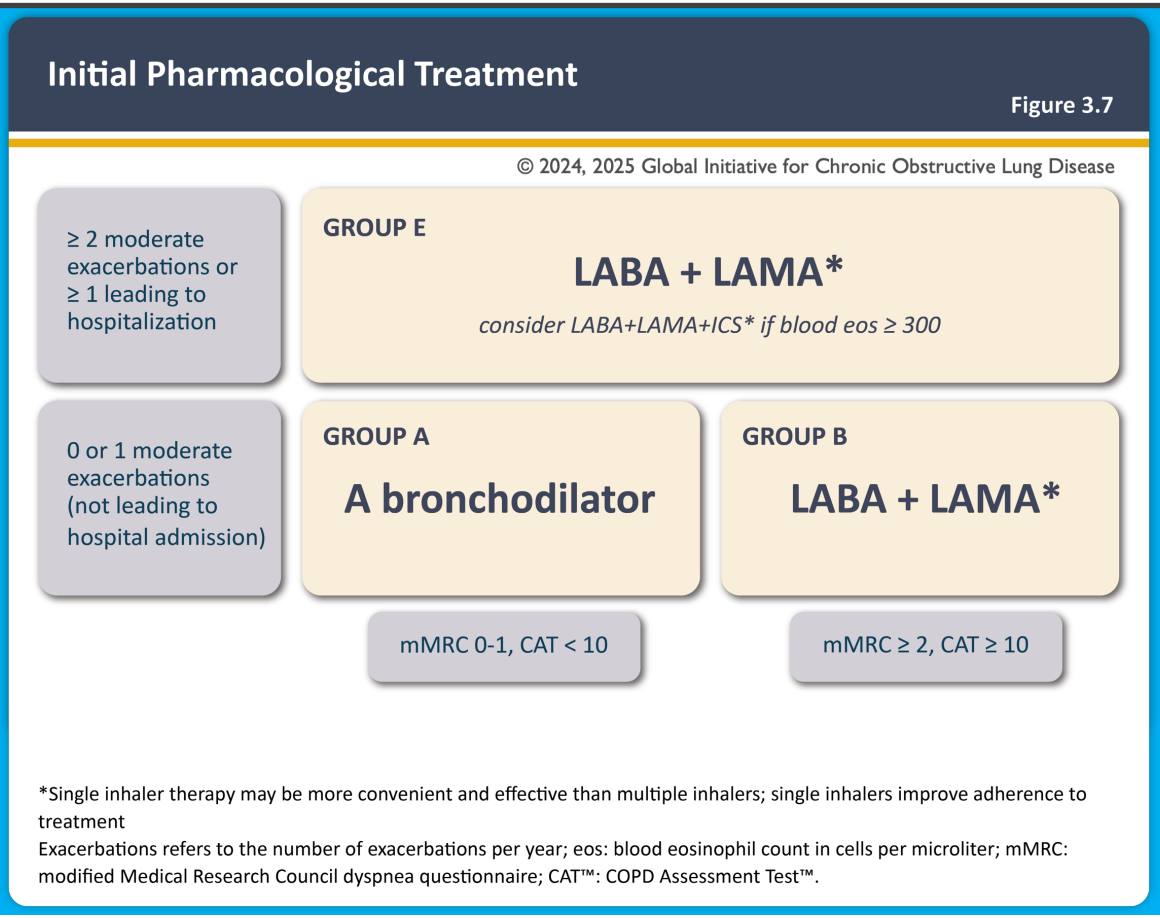
GOLD-recommended Treatment Strategies for Stable COPD

Inhaler device choice must be individually tailored

-dependent upon access, cost, prescriber, **patient's ability and preference**



GOLD-recommended Treatment Strategies for Stable COPD



*Single inhaler therapy may be more convenient and effective than multiple inhalers; single inhalers improve adherence to treatment

Exacerbations refers to the number of exacerbations per year; eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research Council dyspnea questionnaire; CAT™: COPD Assessment Test™.

ANTIBIOTICS, MUCOREGULATOR AND ANTIOXIDANT AGENTS AND OTHER ANTI-INFLAMMATORIES MAY ALSO BE USEFUL

Maintenance Medications in COPD*

Figure 3.18

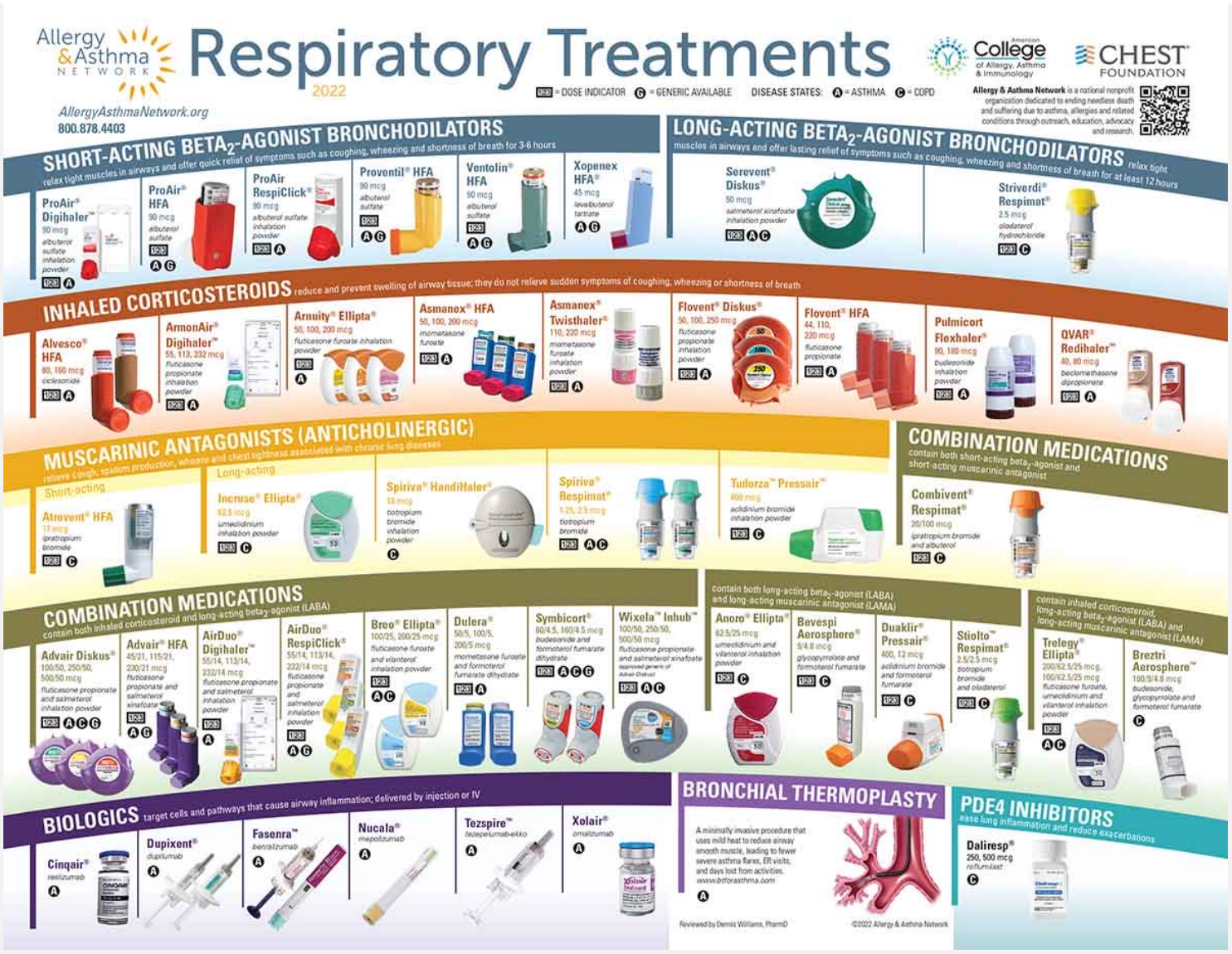
Generic Drug Name	Inhaler Type	Nebulizer	Oral/Injectable Delivery	Duration of Action
$BETA_2$-Agonists				
Short-acting (SABA)				
Fenoterol	MDI	✓	tablet, solution	variable
Levalbuterol	MDI	✓		variable
Salbutamol (albuterol)	MDI & DPI	✓	syrup, tablet	variable
Terbutaline	DPI		tablet	variable
Long-acting (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			12 hours
Glycopyrronium bromide	DPI		solution	variable
Tiotropium	DPI, SMI, MDI			24 hours
Umeclidinium	DPI			24 hours
Glycopyrronium		✓		12 hours
Revefenacin		✓		24 hours
Combination Short-Acting $Beta_2$-Agonist Plus Anticholinergic in One Device (SABA+SAMA)				
Fenoterol/ipratropium	SMI	✓		6-8 hours
Salbutamol/ipratropium	SMI, MDI	✓		variable
Combination Long-Acting $Beta_2$-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, injectable	variable
Theophylline (SR)			tablet, capsule, elixir, solution, injectable	variable
Combination of Long-Acting $Beta_2$-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 propionate	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, DPI			12 hours
Budesonide/formoterol/glycopyrrolate	MDI			12 hours
Phosphodiesterase-3 and/or -4 Inhibitors				
Roflumilast			tablet	24 hours
Ensifentrine		✓		12 hours
Mucolytic Agents				
Erdosteine			capsule, suspension	12 hours
Carbocysteine†			capsule, packet, solution,syrup	6-8 hours
N-acetylcysteine†		✓	solution, tablet	2-6 hours
Biologics				
Dupilumab			injectable	2 weeks

*This list is not exhaustive. Not all formulations are available in all countries. In some countries other formulations and dosages may be available. †Dosing regimens are under discussion. MDI = metered dose inhaler; DPI = dry powder inhaler; SMI = soft mist inhaler. Note that glycopyrrolate & glycopyrronium are the same compound.

Other Pharmacological Treatments

Figure 3.23

Alpha-1 Antitrypsin Augmentation Therapy	• Intravenous augmentation therapy may slow down the progression of emphysema **(Evidence B)**
Antitussives	• There is no conclusive evidence of a beneficial role of antitussives in people with COPD **(Evidence C)**
Vasodilators	• Vasodilators do not improve outcomes and may worsen oxygenation **(Evidence B)**
Opioids	• Low-dose long acting oral and parenteral opioids may be considered for treating dyspnea in COPD patients with severe disease (**Evidence B**)
Pulmonary Hypertension Therapy	• Drugs approved for primary pulmonary hypertension are not recommended for patients with a pulmonary hypertension secondary to COPD (**Evidence B**)


Allergy & Asthma NETWORK
Respiratory Treatments
2022
AllergyAsthmaNetwork.org
800.878.4403
DI = DOSE INDICATOR G = GENERIC AVAILABLE DISEASE STATES: A = ASTHMA C = COPD
American College of Allergy, Asthma & Immunology
CHEST FOUNDATION
Allergy & Asthma Network is a national nonprofit organization dedicated to ending needless death and suffering due to asthma, allergies and related conditions through outreach, education, advocacy and research.
SHORT-ACTING BETA2-AGONIST BRONCHODILATORS
relax tight muscles in airways and offer quick relief of symptoms such as coughing, wheezing and shortness of breath for 3-6 hours
ProAir® Digihaler™ 90 mcg albuterol sulfate inhalation powder DI A
ProAir® HFA 90 mcg albuterol sulfate DI A G
ProAir RespiClick® 90 mcg albuterol sulfate inhalation powder DI A
Proventil® HFA 90 mcg albuterol sulfate DI A G
Ventolin® HFA 90 mcg albuterol sulfate DI A G
Xopenex HFA® 45 mcg levalbuterol tartrate A G
LONG-ACTING BETA2-AGONIST BRONCHODILATORS
relax tight muscles in airways and offer lasting relief of symptoms such as coughing, wheezing and shortness of breath for at least 12 hours
Serevent® Diskus® 50 mcg salmeterol xinafoate inhalation powder DI A C
Striverdi® Respimat® 2.5 mcg olodaterol hydrochloride DI C
INHALED CORTICOSTEROIDS
reduce and prevent swelling of airway tissue; they do not relieve sudden symptoms of coughing, wheezing or shortness of breath
Alvesco® HFA 80, 160 mcg ciclesonide DI A
ArmonAir® Digihaler™ 55, 113, 232 mcg fluticasone propionate inhalation powder DI A
Arnuity® Ellipta® 50, 100, 200 mcg fluticasone furoate inhalation powder DI A
Asmanex® HFA 50, 100, 200 mcg mometasone furoate DI A
Asmanex® Twisthaler® 110, 220 mcg mometasone furoate inhalation powder DI A
Flovent® Diskus® 50, 100, 250 mcg fluticasone propionate inhalation powder DI A
Flovent® HFA 44, 110, 220 mcg fluticasone propionate DI A
Pulmicort Flexhaler® 90, 180 mcg budesonide inhalation powder DI A
QVAR® Redihaler™ 40, 80 mcg beclomethasone dipropionate DI A
MUSCARINIC ANTAGONISTS (ANTICHOLINERGIC)
relieve cough, sputum production, wheeze and chest tightness associated with chronic lung diseases
Short-acting
Atrovent® HFA 17 mcg ipratropium bromide DI C
Long-acting
Incruse® Ellipta® 62.5 mcg umeclidinium inhalation powder DI C
Spiriva® HandiHaler® 18 mcg tiotropium bromide inhalation powder C
Spiriva® Respimat® 1.25, 2.5 mcg tiotropium bromide DI A C
Tudorza™ Pressair™ 400 mcg aclidinium bromide inhalation powder DI C
COMBINATION MEDICATIONS
contain both short-acting beta2-agonist and short-acting muscarinic antagonist
Combivent® Respimat® 20/100 mcg ipratropium bromide and albuterol DI C
COMBINATION MEDICATIONS
contain both inhaled corticosteroid and long-acting beta2-agonist (LABA)
Advair Diskus® 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol inhalation powder DI A C G
Advair® HFA 45/21, 115/21, 230/21 mcg fluticasone propionate and salmeterol xinafoate DI A G
AirDuo® Digihaler™ 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder DI A
AirDuo® RespiClick® 55/14, 113/14, 232/14 mcg fluticasone propionate and salmeterol inhalation powder DI A G
Breo® Ellipta® 100/25, 200/25 mcg fluticasone furoate and vilanterol inhalation powder DI A C
Dulera® 50/5, 100/5, 200/5 mcg mometasone furoate and formoterol fumarate dihydrate DI A
Symbicort® 80/4.5, 160/4.5 mcg budesonide and formoterol fumarate dihydrate DI A C G
Wixela™ Inhub™ 100/50, 250/50, 500/50 mcg fluticasone propionate and salmeterol xinafoate approved generic of Advair Diskus DI A C
contain both long-acting beta2-agonist (LABA) and long-acting muscarinic antagonist (LAMA)
Anoro® Ellipta® 62.5/25 mcg umeclidinium and vilanterol inhalation powder DI C
Bevespi Aerosphere® 9/4.8 mcg glycopyrrolate and formoterol fumarate DI C
Duaklir® Pressair® 400, 12 mcg aclidinium bromide and formoterol fumarate DI C
Stiolto™ Respimat® 2.5/2.5 mcg tiotropium bromide and olodaterol DI C
contain inhaled corticosteroid, long-acting beta2-agonist (LABA) and long-acting muscarinic antagonist (LAMA)
Trelegy® Ellipta® 200/62.5/25 mcg, 100/62.5/25 mcg fluticasone furoate, umeclidinium and vilanterol inhalation powder DI A C
Breztri Aerosphere™ 160/9/4.8 mcg budesonide, glycopyrrolate and formoterol fumarate C
BIOLOGICS
target cells and pathways that cause airway inflammation; delivered by injection or IV
Cinqair® reslizumab A
Dupixent® dupilumab A
Fasenra™ benralizumab A
Nucala® mepolizumab A
Tezspire™ tezepelumab-ekko A
Xolair® omalizumab A
BRONCHIAL THERMOPLASTY
A minimally invasive procedure that uses mild heat to reduce airway smooth muscle, leading to fewer severe asthma flares, ER visits, and days lost from activities. www.btforasthma.com A
PDE4 INHIBITORS
ease lung inflammation and reduce exacerbations
Daliresp® 250, 500 mcg roflumilast C
Reviewed by Dennis Williams, PharmD
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A Guide to Aerosol Delivery Devices for Respiratory Therapists

5th Edition

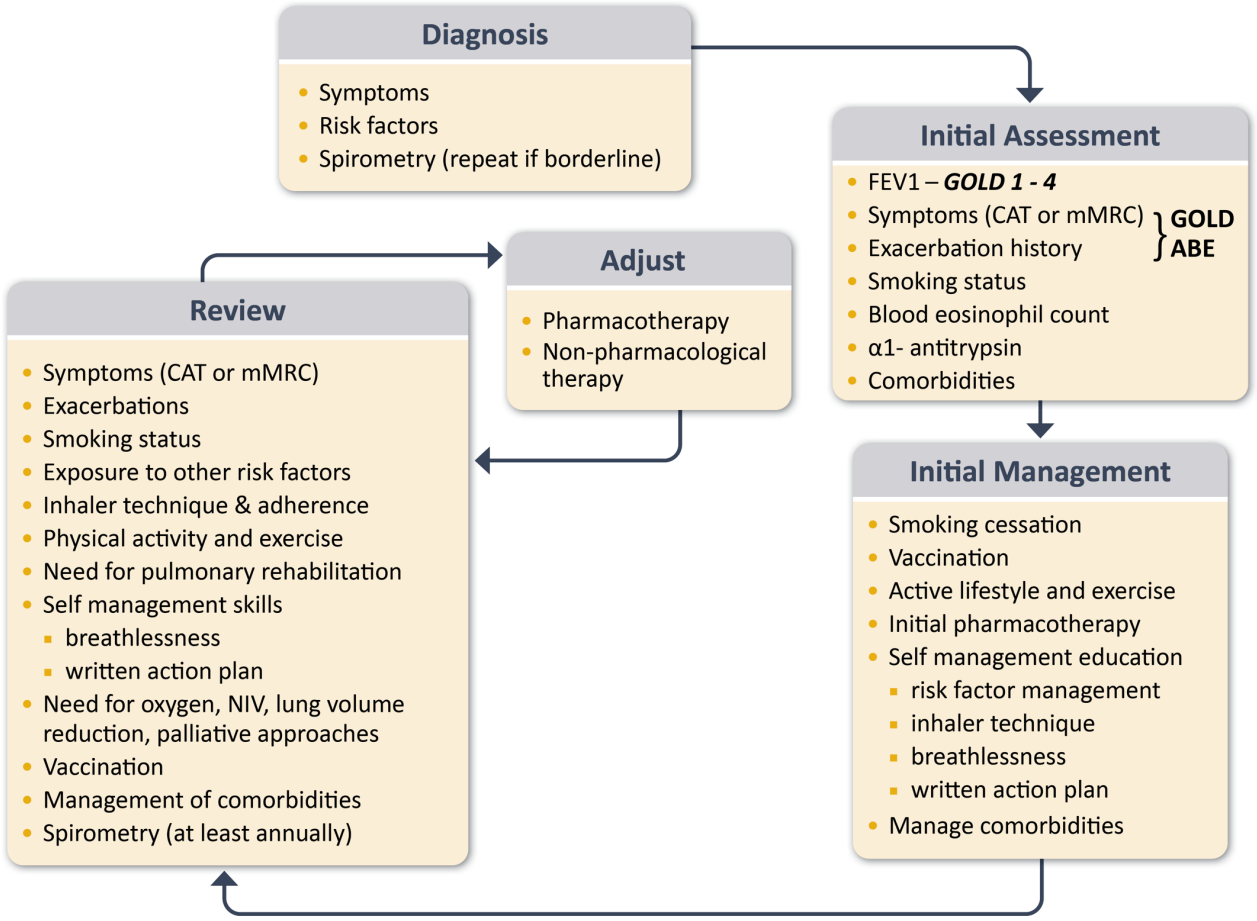
Douglas S. Gardenhire, EdD, RRT, RRT-NPS, FAARC

Linda Nozart, MPH, RRT, AE-C

Sandra T. Hinski, PhD, RRT, RRT-NPS

Management of COPD

Figure 3.2



Pulmonary Rehabilitation

- Rehabilitation is indicated in all patients with relevant symptoms and/or a high risk for exacerbation **(Evidence A)**
- Pulmonary rehabilitation improves dyspnea, health status and exercise tolerance in stable patients **(Evidence A)**
- Pulmonary rehabilitation reduces hospitalization among patients who have had a recent exacerbation (≤ 4 weeks from prior hospitalization) **(Evidence B)**
- Pulmonary rehabilitation leads to a reduction in symptoms of anxiety and depression **(Evidence A)**

Non-Pharmacological Management of COPD*

Figure 3.12

Patient Group	Essential	Recommended	Depending on Local Guidelines
A	Smoking cessation (can include pharmacological treatment)	Physical activity	Influenza vaccination COVID-19 vaccinations Pneumococcal vaccination Pertussis vaccination Shingles vaccination RSV vaccination
B and E	Smoking cessation (can include pharmacological treatment) Pulmonary rehabilitation	Physical activity	Influenza vaccination COVID-19 vaccinations Pneumococcal vaccination Pertussis vaccination Shingles vaccination RSV vaccination

*Can include pharmacological treatment

We have a BIG Responsibility

- When a treatment is given by the inhaled route, the importance of education and training in inhaler device technique cannot be over-emphasized
- The choice of inhaler device has to be individually tailored and will depend on access, cost, prescriber, and most importantly, patient's ability and preference
- It is essential to provide instructions and to demonstrate the proper inhalation technique when prescribing a device, to ensure that inhaler technique is adequate and re-check at each visit that patients continue to use their inhaler correctly
- Inhaler technique (and adherence to therapy) should be assessed before concluding that the current therapy is insufficient

Adjunct Therapies

Diuretics
Anticoagulants
Treatment of comorbidities
Nutritional aspects
Prophylactic measures to prevent thromboembolism

***Smoking cessation recommendation** *always*

Interventions that Reduce the Frequency of COPD Exacerbations

Figure 4.11

Intervention Class	Intervention
Bronchodilators	LABAs LAMAs LABA + LAMA
Corticosteroid-containing regimens	LABA + ICS LABA + LAMA + ICS
Anti-inflammatory (non-steroid)	Roflumilast Dupilumab
Anti-infectives	Vaccines Long Term Macrolides
Mucoregulators	N-acetylcysteine Carbocysteine Erdosteine
Various others	Smoking Cessation Rehabilitation Lung Volume Reduction Vitamin D Shielding measures (e.g., mask wearing, minimizing social contact, frequent hand washing)

Key Points

- **Short-acting beta agonist** (i.e., Albuterol) with or without short-acting anticholinergics (i.e.., Ipratropium bromide) are recommended to initially treat acute COPD exacerbation
- Systemic steroids (i.e., Prednisone) can improve lung function & shorten recovery time & hospital length of stay
- Antibiotics, when indicated, can shorten recovery time, lessen relapse risk, & shorten hospital length of stay
- ~~Methylxanthines~~ (i.e., Theophylline) are not recommended due to overall negative side effects
- Non-invasive Ventilation (i.e., BiPAP) is recommended as initial treatment for COPD patients with acute respiratory failure (if no absolute contraindications are present) & results in decreased hospitalization duration and increased survival

CASE STUDY 1
SYLVESTER SAMUELS

- Mr. Samuels is a 64-year-old male, non-smoker that presents to the pulmonary outpatient clinic after referral from his primary care physician. The patient complains of worsening fatigue overall with chief complaint of dyspnea upon exertion and "nagging dry cough".

Case Study 2

Merta Sanchez

Mrs. Sanchez is a 55-year-old female, long-time smoker with history of AMI (2005) and CABG x 3 (2020) that presents to the pulmonary outpatient clinic for her 3-month follow-up/check-up. The patient reports recent hospitalization for pneumonia. She admits she sometimes "forgets" to take her breathing medicine and is currently still feeling "weak" with productive cough

MERTA SANCHEZ

Tech: GILMORE, TIM
Doctor:

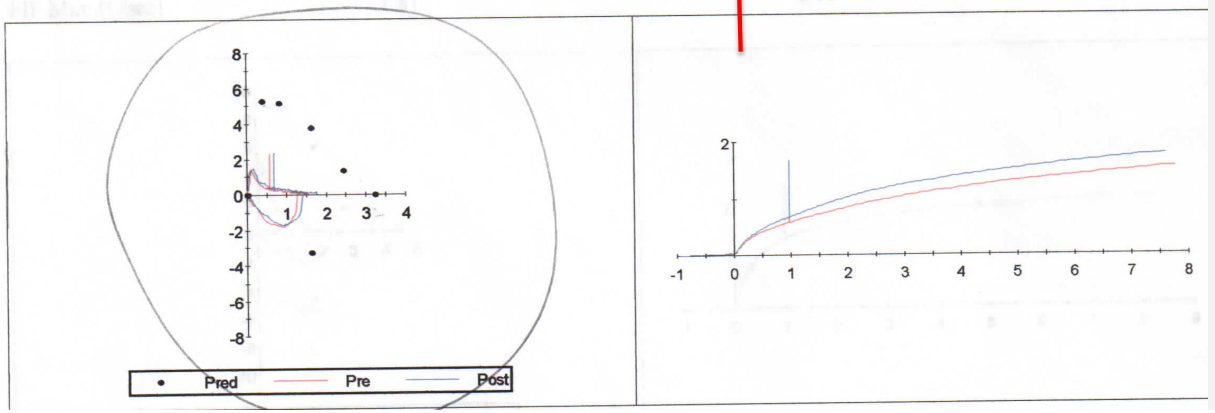
Height: 65.00
Weight: 99.00

Age: 55
Sex: Female

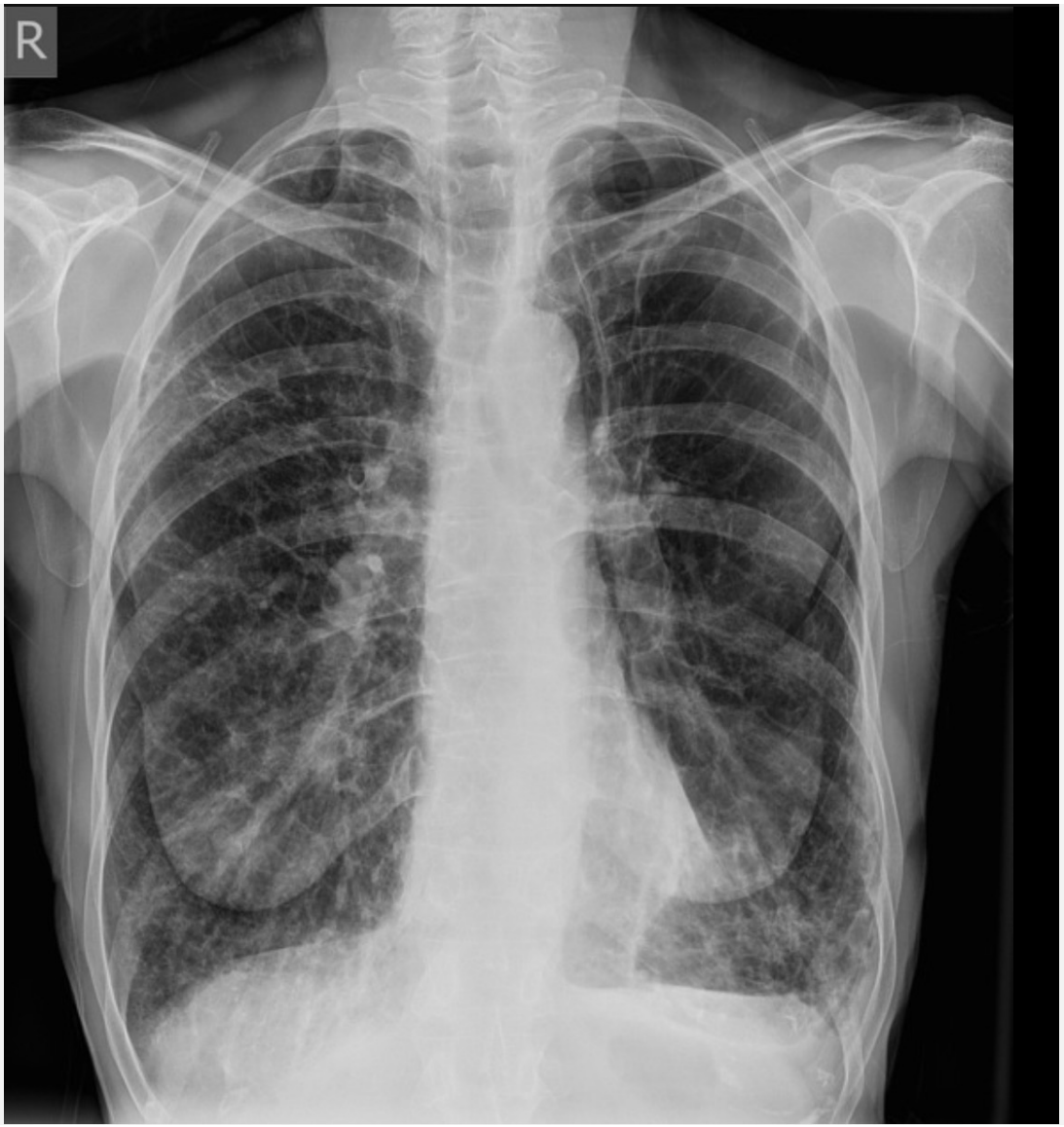
Room:
Race: Black

Diagnosis:
Dyspnea: After any exertion
Cough: Productive
Wheeze:
Tbco Prod: Cigarette
Yrs Smk: 38.0
Pks/Day: 1.0
Yrs Quit:
Medications:
Pre Test Comments:
Post Test Comments: PT. WITH GOOD EFFORT. SHE STATED 2P ALBUTEROL TAKEN WITH SPACER THIS A.M. (8:00). T. GILMORE, RRT, AE-C.

	Pre-Ex			Post-Ex		
	Actual	Pred	%Pred	Actual	%Pred	%Chng
---- SPIROMETRY ----						
FVC (L)	1.54	3.21	48	1.78	55	15
FEV1 (L)	0.59	2.62	23	0.69	26	16
FEV1/FVC (%)	39	82	47	39	47	1
FEF 25% (L/sec)	0.50	5.21	10	0.65	13	31
FEF 75% (L/sec)	0.12	1.33	9	0.21	16	67
FEF 25-75% (L/sec)	0.23	2.85	8	0.36	13	53
FEF Max (L/sec)	1.39	5.27	26	1.46	28	5
FIVC (L)	1.28			1.41		10
FIF Max (L/sec)	1.82			1.68		-8



MERTA
SANCHEZ



Case Study 3

Hoby Algohim

Mr. Algohim is a 49-year-old 2 pack-per day smoker and prior textile factory worker who recently medically retired and remains on disability with worsening symptoms. He is being seen by the pulmonary specialist in the outpatient clinic. for follow-up after multiple exacerbations and one hospitalization (approx. 2 weeks prior).

CAT™ Assessment

Figure 2.10

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 X	I cough all the time	
I have no phlegm (mucus) in my chest at all	0 1 X 3 4 5	My chest is completely full of phlegm (mucus)	
My chest does not feel tight at all	0 1 2 X 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 X	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 X	I am very limited doing activities at home	
I am confident leaving my home despite my lung condition	0 1 2 3 X 5	I am not at all confident leaving my home because of my lung condition	
I sleep soundly	0 1 2 3 X 5	I don't sleep soundly because of my lung condition	
I have lots of energy	0 1 2 3 4 X	I have no energy at all	

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

TOTAL SCORE: 33

Modified MRC Dyspnea Scale

Figure 2.9

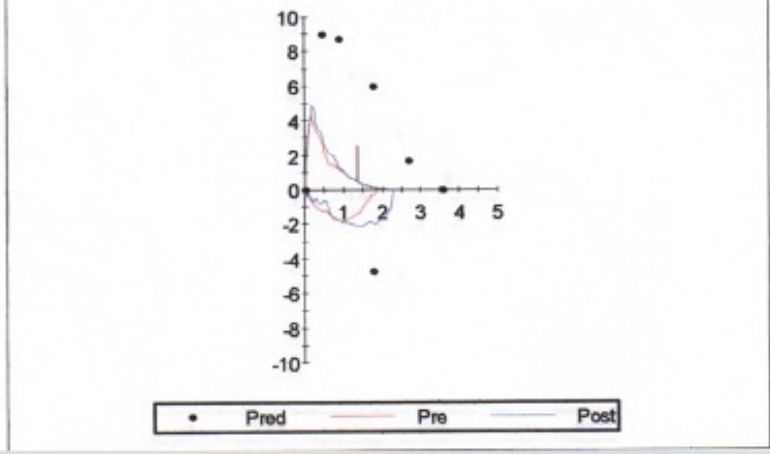
PLEASE TICK IN THE BOX THAT APPLIES TO YOU | ONE BOX ONLY | Grades 0 - 4

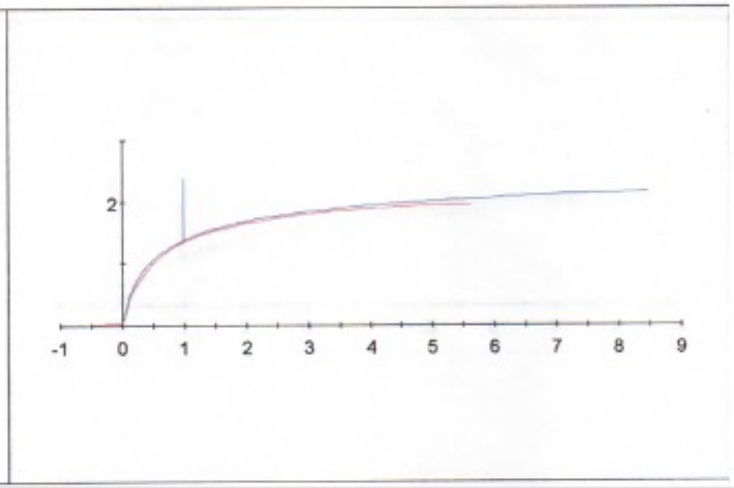
mMRC Grade 0	mMRC Grade 1	mMRC Grade 2	mMRC Grade 3	mMRC Grade 4
I only get breathless with strenuous exercise	I get short of breath when hurrying on the level or walking up a slight hill	I walk slower than people of the same age on the level because of breathlessness, or I have to stop for breath when walking on my own pace on the level	I stop for breath after walking about 100 meters or after a few minutes on the level	I am too breathless to leave the house or I am breathless when dressing or undressing
☐	☐	☐	☒	☐

Reference: ATS (1982) Am Rev Respir Dis. Nov;126(5):952-6.

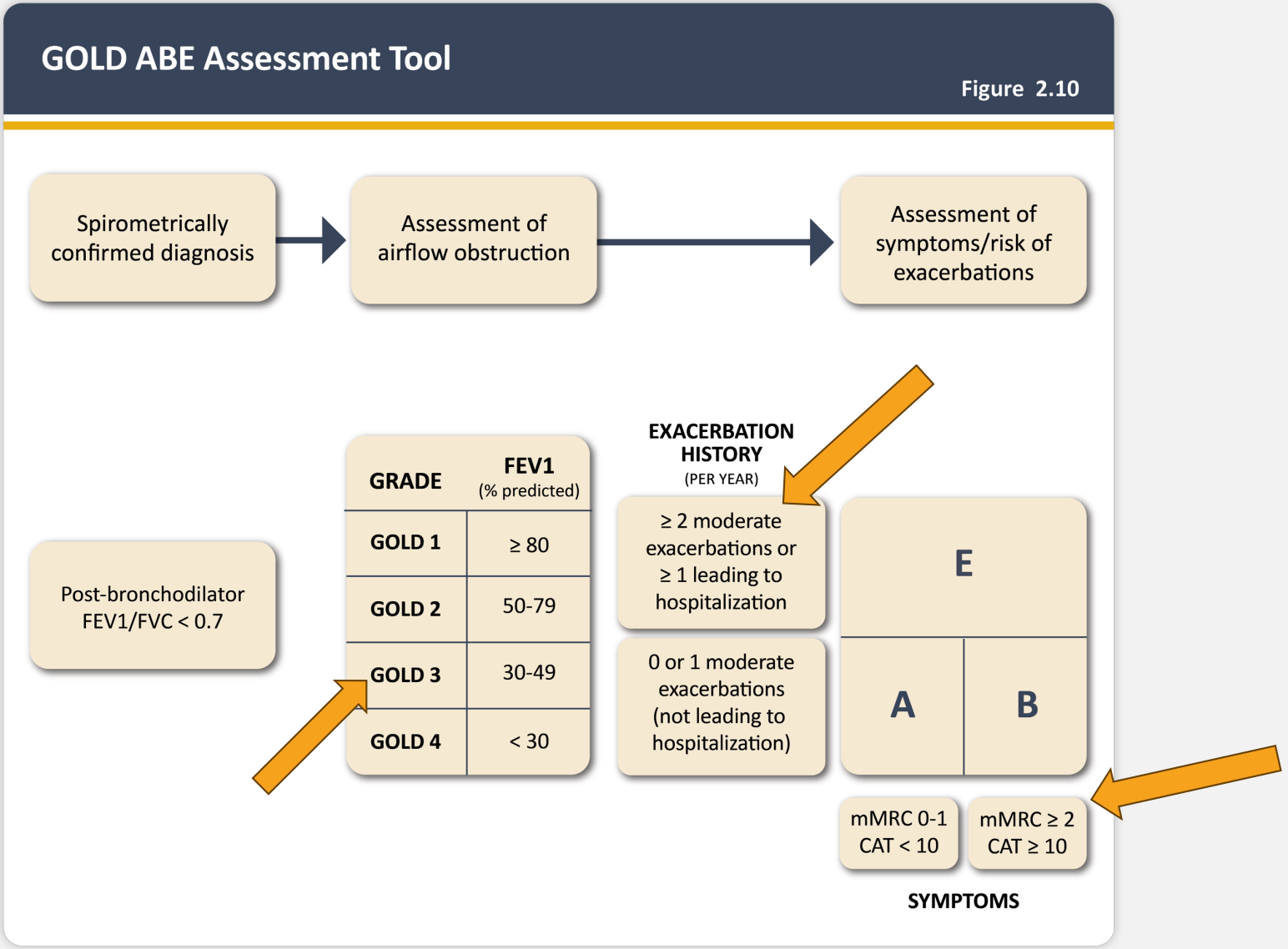
HOBY ALGOHIM

	Pre-Ex			Post-Ex		
	Actual	Pred	%Pred	Actual	%Pred	%Chng
---- SPIROMETRY ----						
FVC (L)	2.00	3.55	56	2.16	61	8
FEV1 (L)	1.36	2.85	48	1.40	49	3
FEV1/FVC (%)	68	80	85	65	81	-5
FEF 25% (L/sec)	2.43	8.72	28	2.77	32	14
FEF 75% (L/sec)	0.33	1.68	20	0.35	21	6
FEF 25-75% (L/sec)	0.85	2.97	29	0.86	29	1
FEF Max (L/sec)	4.13	9.02	46	4.62	51	12
FIVC (L)	1.87			2.30		23
FIF Max (L/sec)	1.81			2.13		17



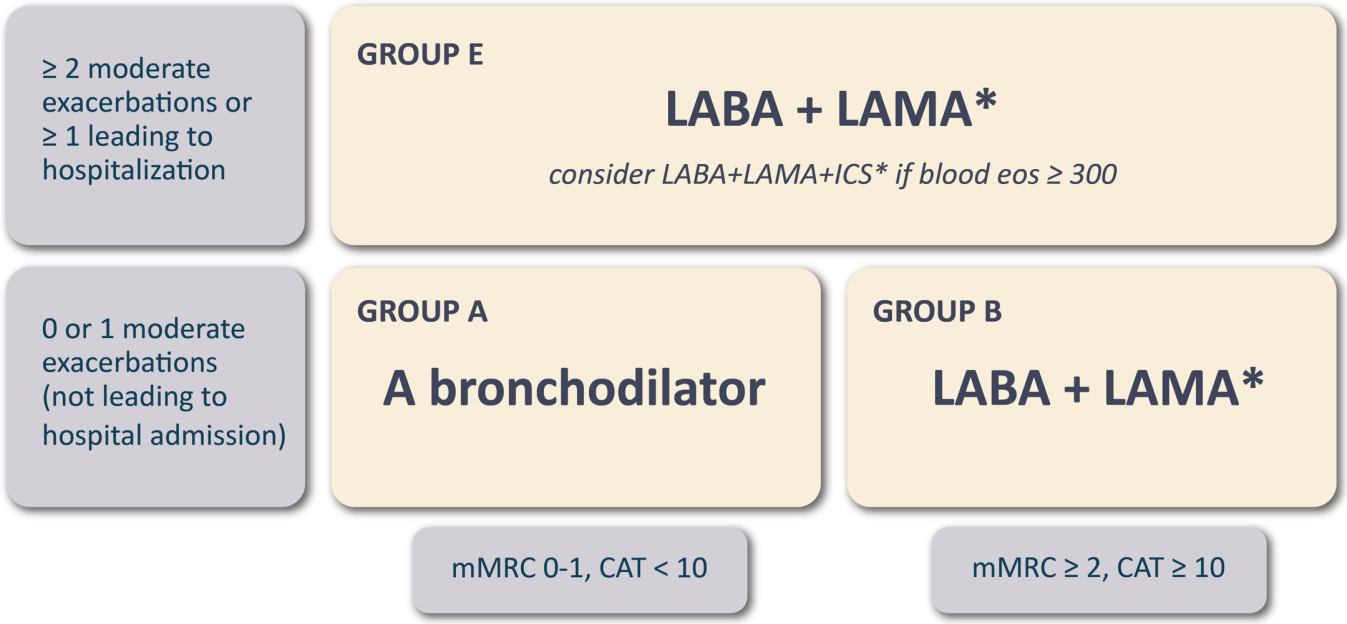


HOBY ALGOHIM



Initial Pharmacological Treatment

Figure 3.7



*Single inhaler therapy may be more convenient and effective than multiple inhalers; single inhalers improve adherence to treatment

Exacerbations refers to the number of exacerbations per year; eos: blood eosinophil count in cells per microliter; mMRC: modified Medical Research Council dyspnea questionnaire; CAT™: COPD Assessment Test™.

TREATMENT STRATEGIES

Stable COPD

- Bronchodilators
  - SABA, LABA, SAMA
  - Combotherapy > Monotherapy
- Inhaled Corticosteroids
- PDE4 inhibitors
- Mucoregulators
- Supplemental O2?

COPD Exacerbations

- Bronchodilators
  - SABA, LABA, SAMA
  - Combotherapy > Monotherapy
- Inhaled Corticosteroids
- **Systemic Corticosteroids**
- PDE4 inhibitors
- Mucoregulators
- Supplemental O2
- **Mechanical Ventilation**
- **Antibiotics**

Oxygen Therapy and Ventilatory Support in Stable COPD

Figure 3.14

Oxygen Therapy	• The long-term administration of oxygen increases survival in patients with severe chronic resting arterial hypoxemia **(Evidence A)** • In patients with stable COPD and moderate resting or exercise-induced arterial desaturation, prescription of long-term oxygen does not lengthen time to death or first hospitalization or provide sustained benefit in health status, lung function and 6-minute walk distance **(Evidence A)** • Resting oxygenation at sea level does not exclude the development of severe hypoxemia when traveling by air **(Evidence C)**
Ventilatory Support	• NPPV may improve hospitalization-free survival in selected patients after recent hospitalization, particularly in those with pronounced daytime persistent hypercapnia ($PaCO_2$ > 53 mmHg) **(Evidence B)** • In patients with severe chronic hypercapnia and a history of hospitalization for acute respiratory failure, long-term noninvasive ventilation may be considered **(Evidence B)**

Prescription of Supplemental Oxygen to COPD Patients

Arterial hypoxemia defined as:

$PaO_2 \leq 55$ mmHg (7.3 kPa) or $SaO_2 < 88\%$

or

$PaO_2 > 55$ but < 60 mmHg (> 7.3 kPa but < 8 kPa) with right heart failure or erythrocytosis

↓

Prescribe supplemental oxygen and titrate to keep $SaO_2 \geq 90\%$

↓

Recheck in 60 to 90 days to assess:

- If supplemental oxygen is still indicated
- If prescribed supplemental oxygen is effective

Evidence Supporting a Reduction in Mortality with Pharmacotherapy and Non-pharmacotherapy in COPD Patients

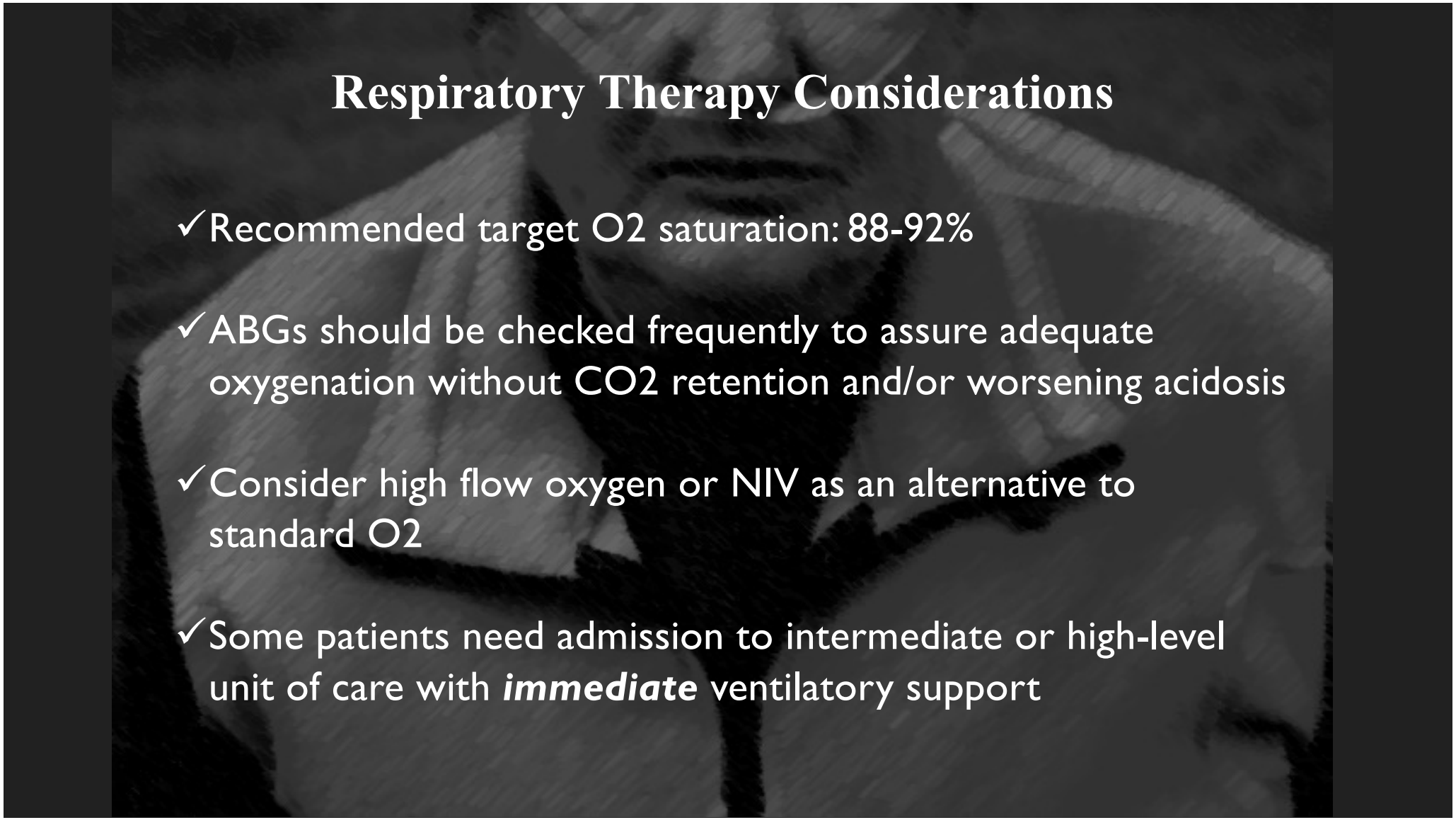
Figure 3.17

Therapy	RCT*	Treatment effect on mortality	Patient characteristics
Pharmacotherapy			
LABA+LAMA+ICS[1]	Yes	Single inhaler triple therapy compared to dual LABD therapy relative risk reduction: IMPACT: HR 0.72 (95% CI: 0.53, 0.99)[1a] ETHOS: HR 0.51 (95% CI: 0.33, 0.80)[1b]	Symptomatic people with a history of frequent and/or severe exacerbations
Non-pharmacological Therapy			
Smoking cessation[2]	Yes	HR for usual care group compared to intervention group (smoking cessation) HR 1.18 (95% CI: 1.02, 1.37)[2]	Asymptomatic or mildly symptomatic
Pulmonary rehabilitation[3#]	Yes	Old trials: RR 0.28 (95% CI 0.10, 0.84)[3a] New trials: RR 0.68 (95% CI 0.28, 1.67)[3b]	Hospitalized for exacerbations of COPD (during or ≤ 4 weeks after discharge)
Long-term oxygen therapy[4]	Yes	NOTT: ≥ 19 hours of continuous oxygen vs ≤ 13 hours: 50% reduction[4a] MRC: ≥ 15 hours vs no oxygen: 50% reduction[4b]	PaO_2 ≤ 55 mmHg or < 60 mmHg with *cor pulmonale* or secondary polycythemia
Noninvasive positive pressure ventilation[5]	Yes	12% in NPPV (high IPAP level) and 33% in control HR 0.24 (95% CI 0.11, 0.49)[5]	Stable COPD with marked hypercapnia
Lung volume reduction surgery[6]	Yes	0.07 deaths/person-year (LVRS) vs 0.15 deaths/person-year (UC) RR for death 0.47 (p = 0.005)[6]	Upper lobe emphysema and low exercise capacity

*RCT with pre-specified analysis of the mortality outcome (primary or secondary outcome); #Inconclusive results likely due to differences in pulmonary rehabilitation across a wide range of participants and settings.

1. a) IMPACT trial (Lipson et al. 2020) and b) ETHOS trials (Martinez et al. 2021); 2.Lung Health Study (Anthonisen et al. 2005); 3. a) Puhan et al. (2011) and b) Puhan et al. 2016; 4. a) NOTT (NOTT, 1980) and b) MRC (MRC, 1981); 5. Kohlein trial (Kohlein et al. 2014); 6. NETT trial (Fishman et al. 2003)

ICS: inhaled corticosteroid; IPAP: inspiratory positive airway pressure; LABA: long-acting beta$_2$-agonist; LABD: long-acting bronchodilator; LAMA: long-acting anti-muscarinic; LTOT: long-term oxygen therapy; NPPV: noninvasive positive pressure ventilation; LVRS: lung volume reduction surgery; UC: usual treatment control group.

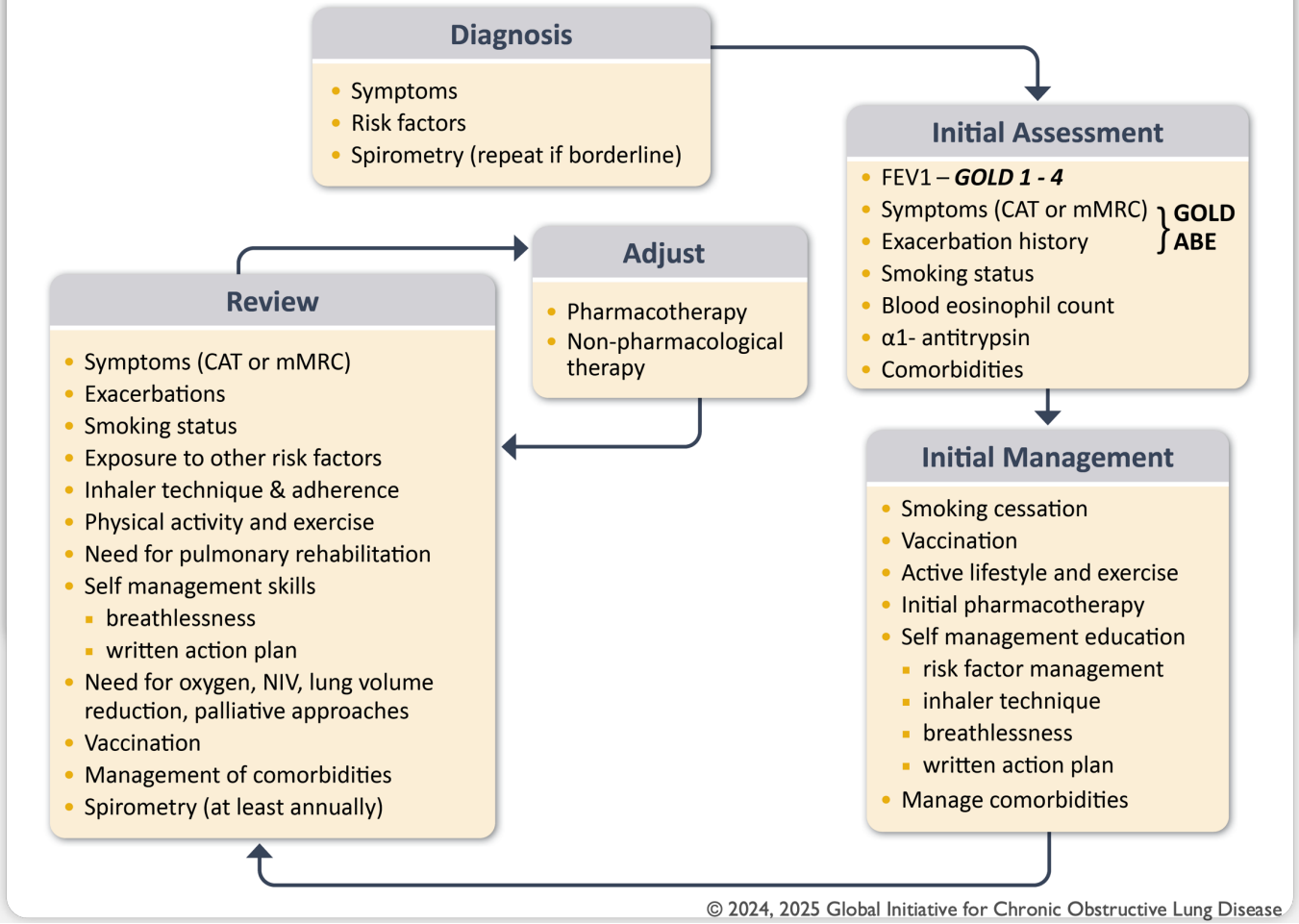


Respiratory Therapy Considerations

- ✓Recommended target O2 saturation: 88-92%
- ✓ABGs should be checked frequently to assure adequate oxygenation without CO2 retention and/or worsening acidosis
- ✓Consider high flow oxygen or NIV as an alternative to standard O2
- ✓Some patients need admission to intermediate or high-level unit of care with ***immediate*** ventilatory support

Management of COPD

Figure 3.2

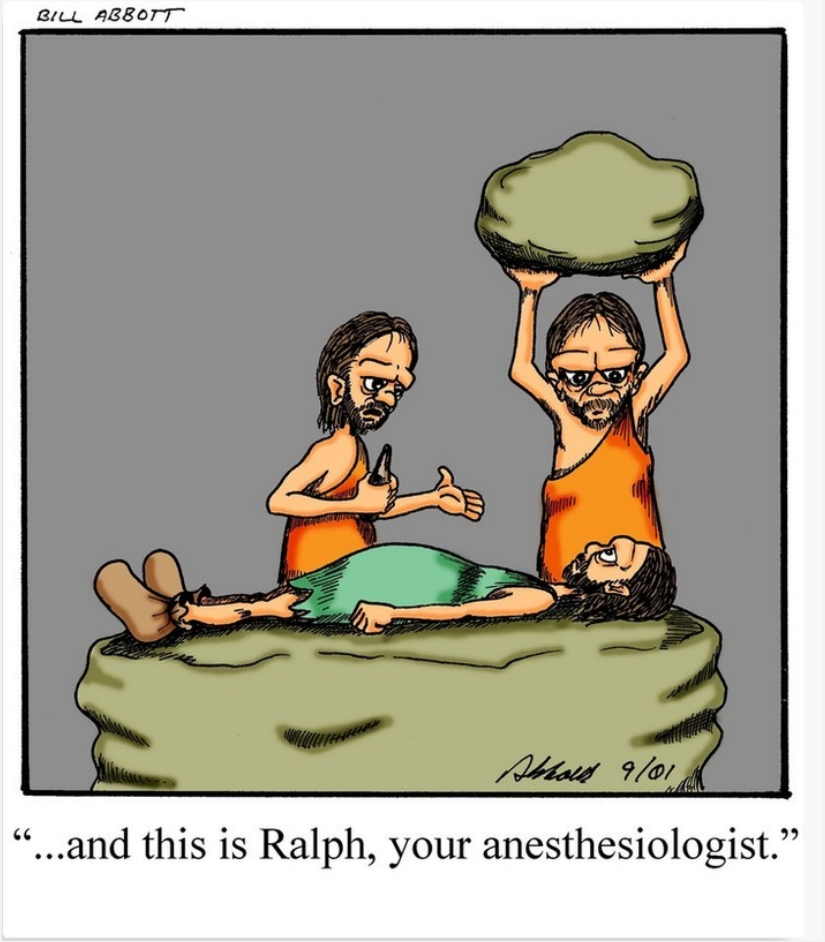


GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE

GLOBAL INITIATIVE FOR CHRONIC OBSTRUCTIVE LUNG DISEASE

New Opportunities

- COPD is a common, preventable, and treatable disease, but extensive under-diagnosis and misdiagnosis leads to patients receiving no treatment or incorrect treatment. Appropriate and earlier diagnosis of COPD can have a very significant public-health impact.
- The realization that environmental factors other than tobacco smoking can contribute to COPD, that it can start early in life and affect young individuals, and that there are precursor conditions (Pre-COPD, PRISm), opens new windows of opportunity for its prevention, early diagnosis, and prompt and appropriate therapeutic intervention.



Thanks for listening.

Questions?

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