



COPD Updates

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Objectives

- To understand new definitions & phenotypes of COPD
- To identify causes & risk factors other than tobacco smoking
- To understand how to evaluate for COPD & initiate clinical assessment
- To develop an approach to evaluating severity & burden of disease
- To understand pharmacologic & non-pharmacologic management strategies

COPD epidemiology



13%
global prevalence

- 3rd leading cause of death worldwide.
- >3 million people died of COPD in 2012 (~6% of global deaths).
- COPD is a preventable and treatable public health challenge.
- COPD burden projected to increase in coming decades due to:
 - Continued exposure to risk factors
 - Aging population

Bianco I et al. Eur Respir J 2019.
Halpin DMG et al. Int J Tuberc Lung Dis 2019.
Meghji J et al. Lancet 2021.
Mathers CD et al. PLoS Med 2006.

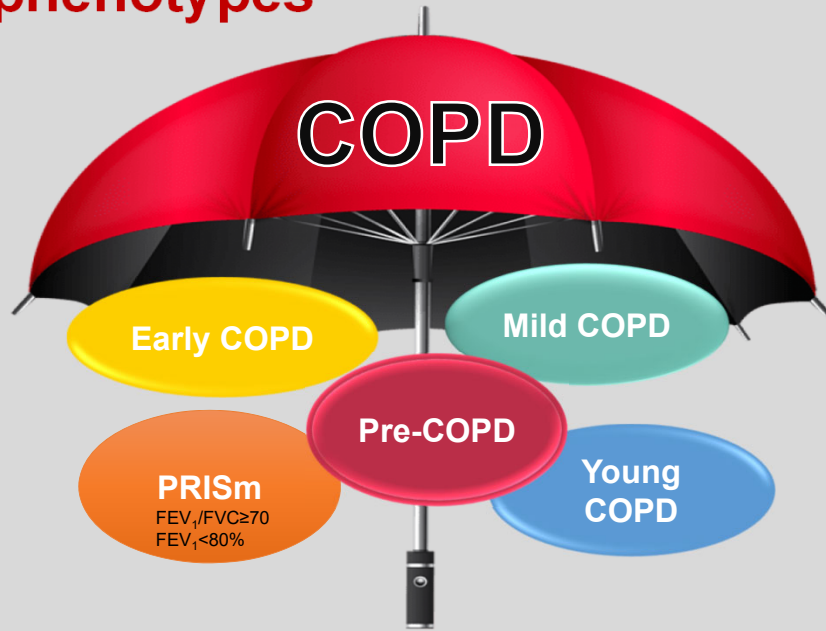
Updated COPD definition

“A **heterogenous** lung condition characterized by **chronic respiratory symptoms** (dyspnea, cough, sputum production and/or exacerbations) due to **abnormalities of the airways** (bronchitis) and/or **alveoli** (emphysema) that cause persistent, often progressive, **airflow obstruction.**”

— **GOLD 2024**

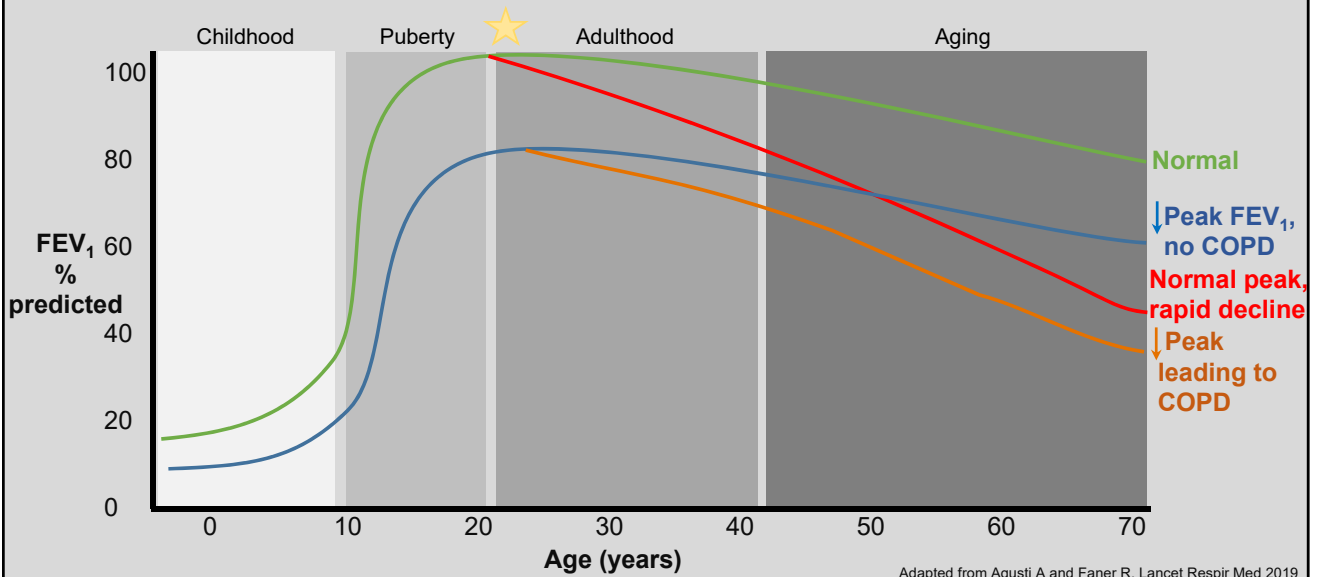
GOLD 2024

COPD phenotypes



Agusti A, AJRCCM 2023.
GOLD 2024.

Lung function trajectories



COPD is not just a “smoker’s disease”

- **25-45%** of COPD globally is accounted for by factors other than tobacco smoking.
- COPD results from **cumulative gene-environment interactions over the life course**, which damage the lungs, or alters normal lung development and aging.

Salvi S and Barnes P. Lancet 2009.
Agusti A et al. Lancet Respir Med 2022.

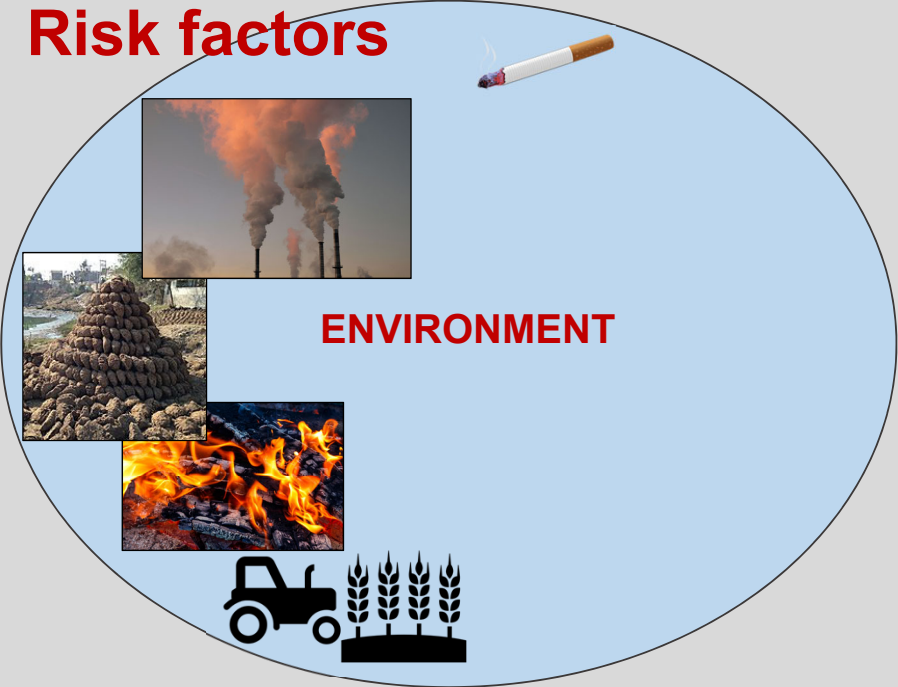
Risk factors



ENVIRONMENT

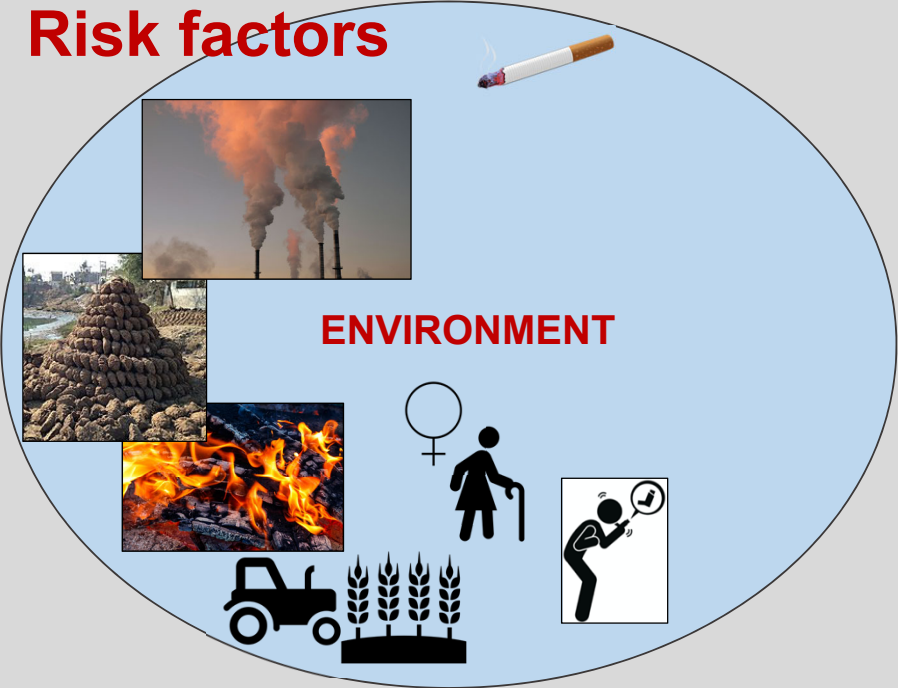
Agusti A. AJRCCM 2023.
Salvi S. Respiriology 2018.

Risk factors

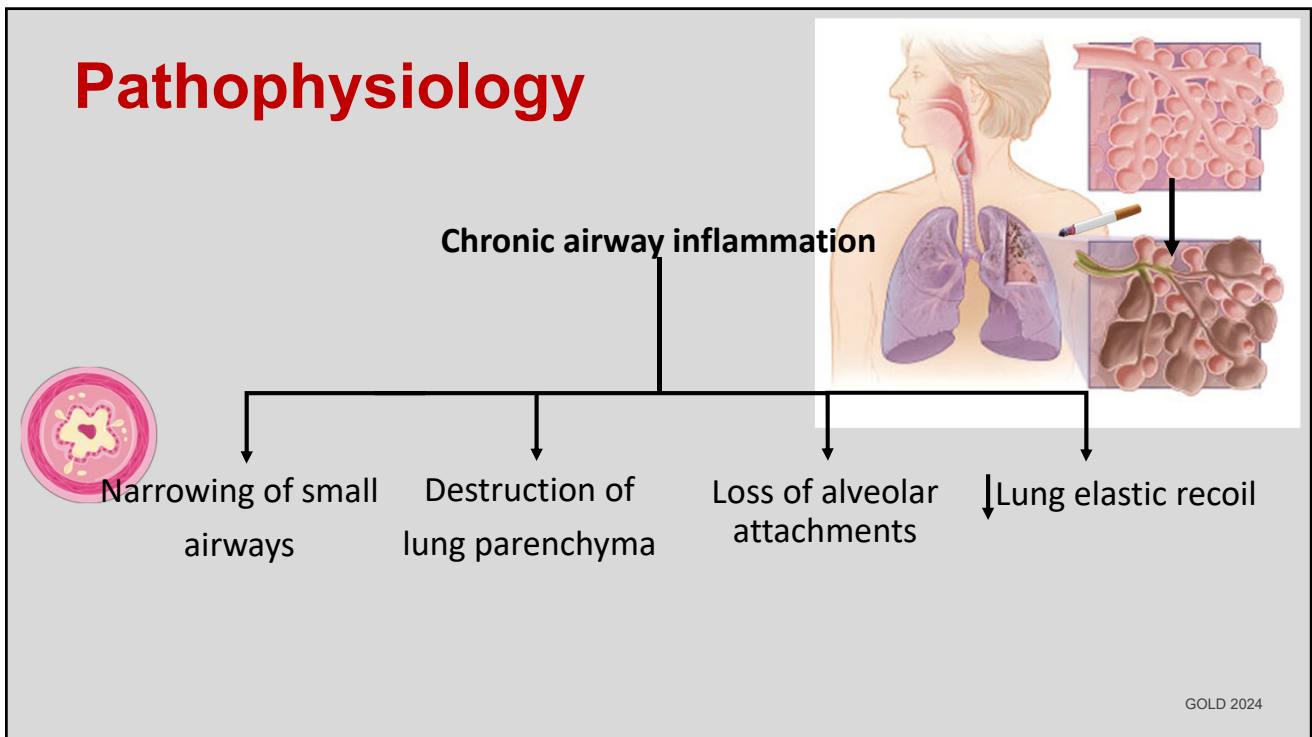
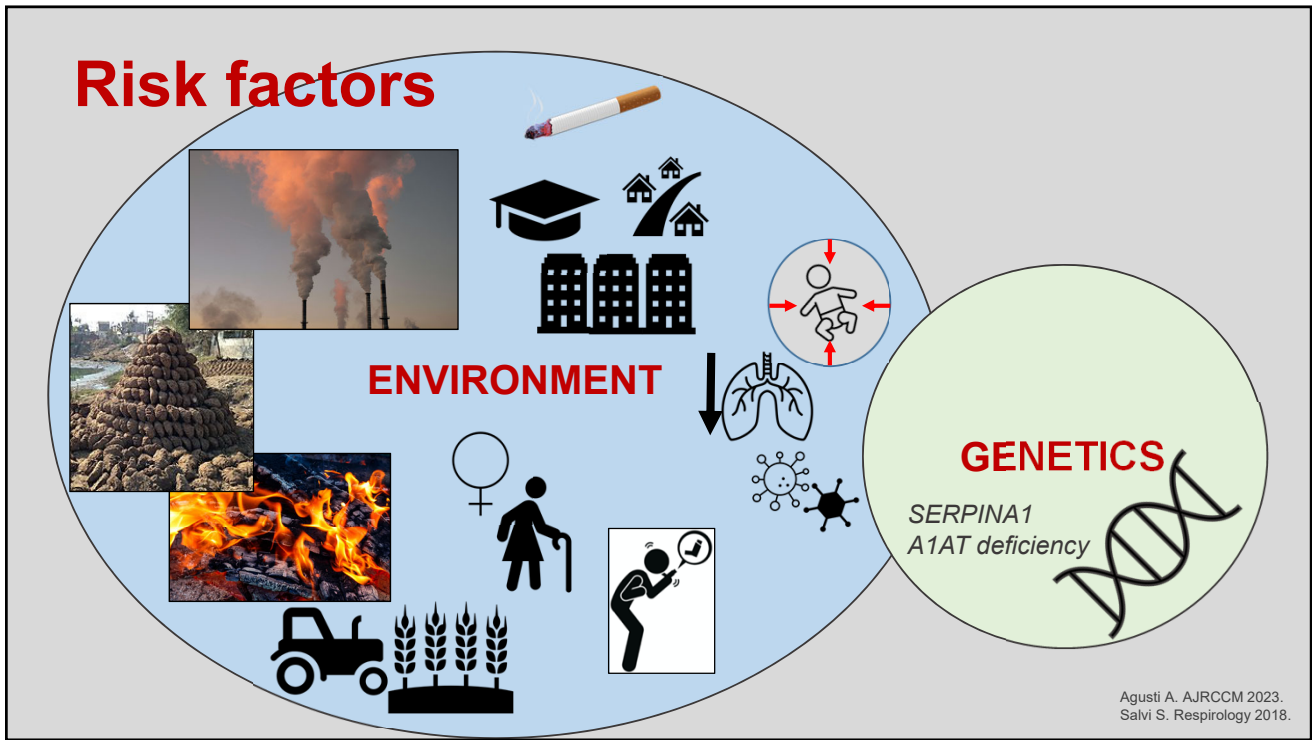


Agusti A. AJRCCM 2023.
Salvi S. Respirology 2018.

Risk factors

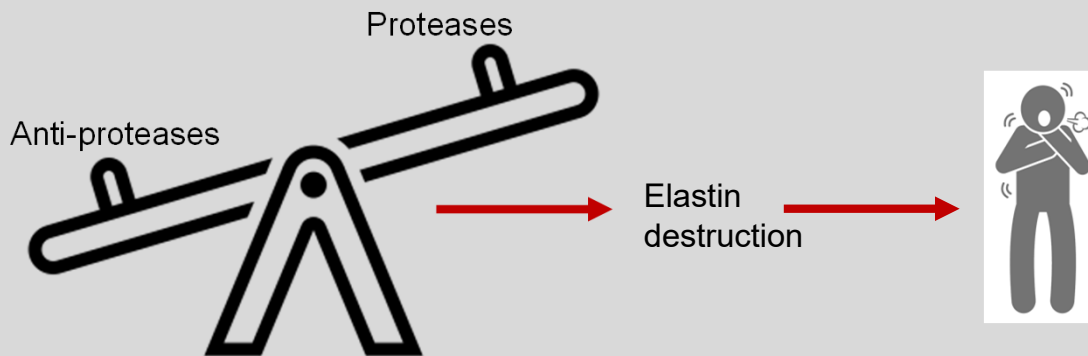
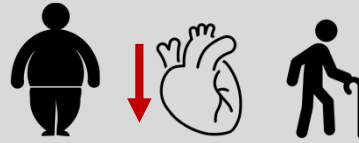


Agusti A. AJRCCM 2023.
Salvi S. Respirology 2018.



Pathophysiology

- **Systemic inflammation**
 - Associated with comorbid conditions
- **Oxidative stress**



Diagnosis

- Respiratory symptoms + spirometric airflow obstruction.
- Obstruction may be defined as $FEV_1/FVC < 0.70$ (GOLD) or $< LLN$ (ATS/ERS).
 - Neither approach is superior to the other.
 - Always consider spirometry in clinical context.



Agusti A. AJRCCM 2023.
GOLD 2024.

Clinical assessment

Goals are to determine:

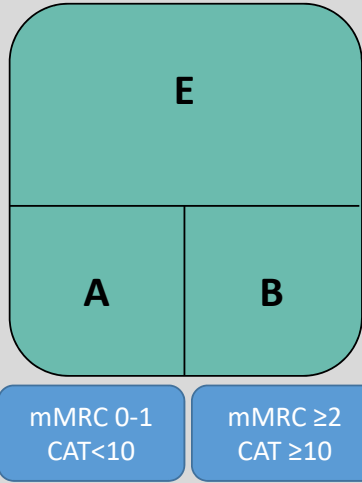
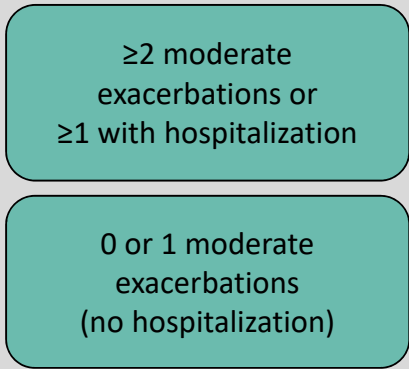
1. Severity of airflow limitation
2. Symptom burden
3. History of exacerbations
4. Presence and type of co-morbidities

GOLD 2024.

Clinical assessment

GRADE	FEV ₁ (% predicted)
GOLD 1	≥80
GOLD 2	50-79
GOLD 3	30-49
GOLD 4	<30

Exacerbation history
(per year)



Adapted from GOLD 2024

Symptoms

Clinical assessment

- Chest imaging cannot confirm a diagnosis of COPD.

CT chest can be used to:

Diagnose pulmonary emphysema

For lung cancer screening

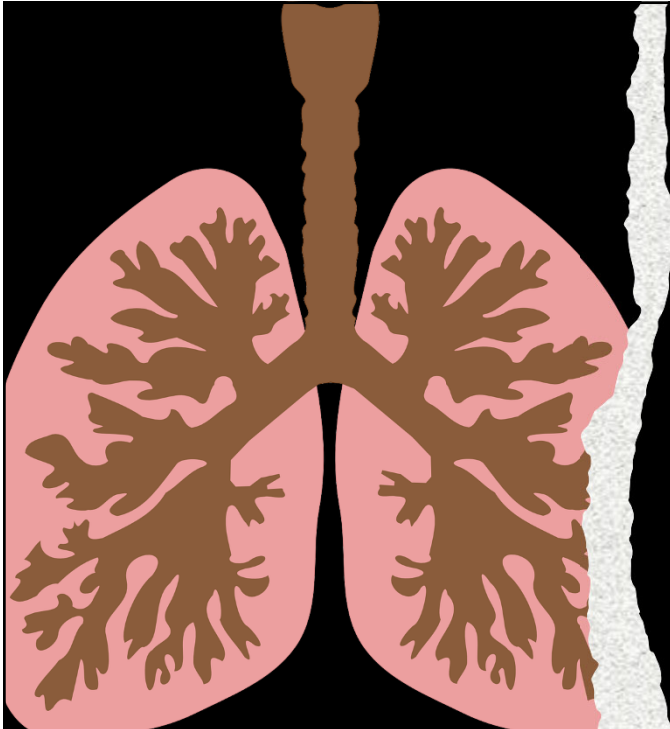


Exclude alternative diagnoses



Quantify airway abnormalities -
Dysanapsis

Agusti A. AJRCCM 2023.
GOLD 2024.



Summary

- COPD is not simply a “smoker’s disease.”
- COPD is a heterogenous disease resulting from complex gene-environment interactions over the life course.
- Clinical assessment should include symptoms, exacerbation history & evidence of airflow obstruction.



COPD Updates

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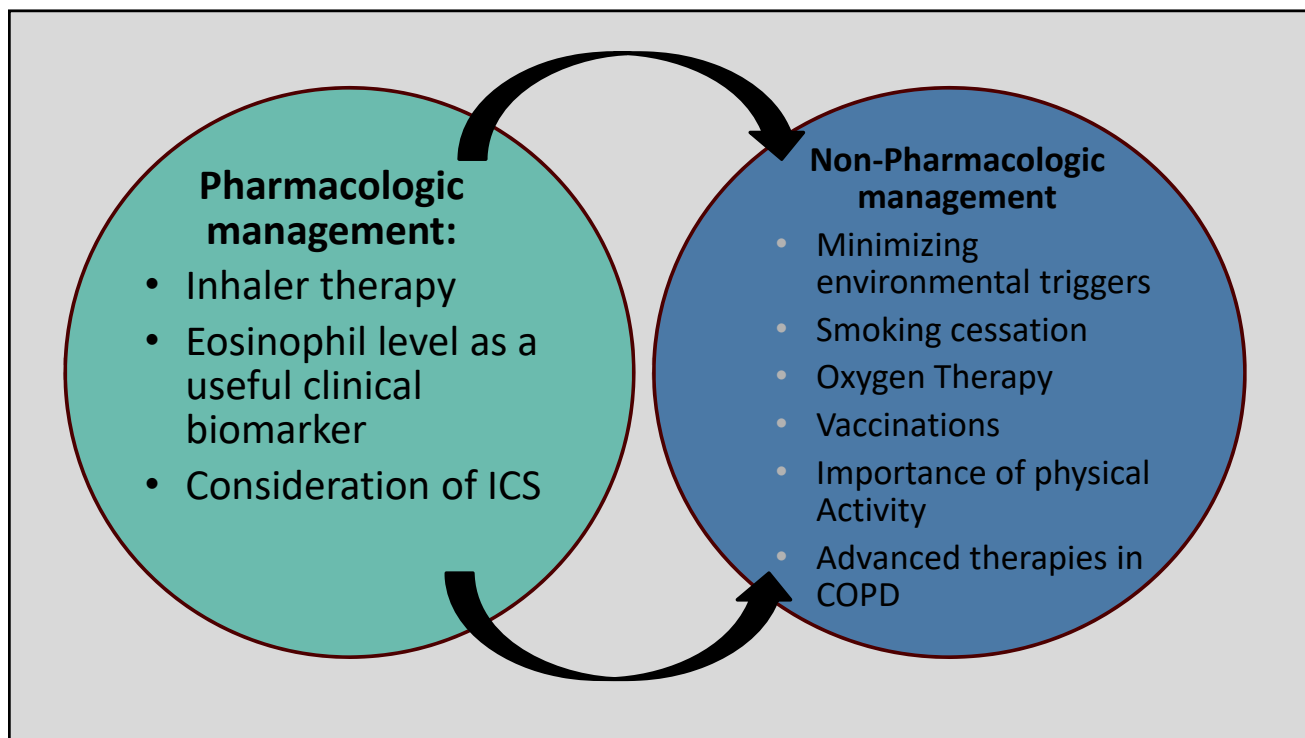
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Management Approach:

Recent emphasis on identification of “treatable traits” which guides escalation/de-escalation of treatment

- Symptom burden
- Risk of exacerbation
- Disease progression

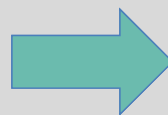
GOLD 2024



Inhaler Therapy: Foundation of COPD Management

Considerations Include:

- Inhaler teaching and technique
- Cost of inhaler therapy



Require regular reassessment!!



Important Abbreviations:

LABA: Long-acting β 2 adrenergic receptor agonist

LAMA: Long-acting anti-muscarinic agonist

ICS: Inhaled Corticosteroid

Pharmacologic Treatment

≥2 moderate exacerbations or ≥1 requiring hospitalization

Group E

LAMA + LABA

Consideration of ICS if blood Eosinophils >300

0-1 moderate exacerbations NOT requiring hospitalization

Group A

BRONCHODILATOR

Group B

LAMA + LABA

mMRC 0-1
CAT <10

mMRC ≥2
CAT ≥10

Adapted from Gold 2024

Updates for COPD Group B

Dual therapy with LABA + LAMA is now recommended over monotherapy

- Improved FEV1
- Reduction in dyspnea
- Improved quality of life
- Reduced exacerbation risk
- Similar side effect profile

Umeclidinium bromide / Vilanterol (Anoro)
Glycopyrrolate/Formoterol fumerate (Brevespi)
Tiotropium bromide/Olodaterol (Stiolto)

Mahler DA. Eur Respir J 2014
Singh D. Respir Med 2015
Maltais F. Respir Res 2019

Updates for COPD Group E

Fluticasone furoate/Umeclidinium/Vilanterol (Trelegy)
Budesonide/glycopyrrolate/formoterol fumarate (Breztri)

Dual therapy with LABA + LAMA is also recommended EXCEPT in patients with blood eosinophils >300. In this case triple therapy is recommended with ICS + LABA + LAMA.

If ICS is indicated, ICS + LABA + LAMA has been shown to be superior.

ICS + LABA is NO LONGER RECOMMENDED

GOLD 2024
Lipson DA. N Engl J Med. 2018
Rabe KF. N Engl J Med. 2020.

Blood Eosinophil Level: A Treatable Trait

Useful marker to determine which patients would potentially benefit from the addition of an ICS to their inhaler regimen that would reduce the risk of future exacerbation.

- 2 RCTs (IMPACT & TRIBUTE) of triple therapy vs LABA/LAMA confirmed greater ICS effect in patients with >150 eosinophils
- FLAME study showed ICS withdrawal in patients with Eosinophils >300 resulted in increased risk of exacerbation

GOLD 2024
Agusti. Eur Respir J. 2018
Singh. AM J Respir Crit Care Med. 2022.

When to consider ICS

Favors Use

- Hospitalization
- >2 moderate exacerbations in last year
- Blood Eosinophils >300
- Asthma Overlap

Consider Use

- 1 moderate exacerbation in last year
- Blood Eosinophils 100-300

Avoid Use

- Repeated episodes of pneumonia
- Hx mycobacterial infection
- Blood Eosinophils <100

GOLD 2024
Agusti. ERJ. 2018

A word on Dupilumab: BOREAS TRIAL

Recent study has demonstrated that dupilumab may be effective in reducing exacerbation risk in patients with eosinophil level >300

- These patients were already on triple therapy
 - Significant reduction in annual rate of moderate to severe exacerbations in patients in treatment group
- Recent NOTUS Trial pending publication confirms these results

Bhatt, NEJM. 2023

Key Non-Pharmacologic Considerations:

Smoking Cessation

- Cornerstone of COPD management

Oxygen Therapy

- All patients regardless of stage of disease should be evaluated

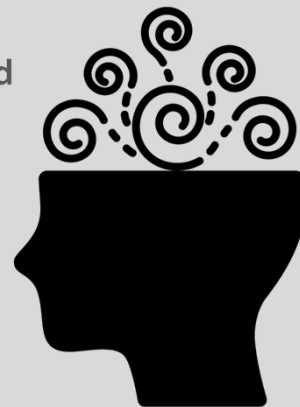
Vaccinations

- Updates:
 - Covid
 - RSV

COPD is a Systemic Disease

Common co-morbidities should be identified and addressed:

- **Anxiety and Depression***
 - Very high prevalence and often under-recognized
- Cardiovascular disease
- Lung cancer
- OSA
- Osteoporosis
- Secondary polycythemia
- GERD



Panagioti. *International Journal of COPD*. 2014
Am J Respir Crit Care Med. 2008;(178):913-920

Physical Activity: Aerobic Activity is Key!

- It is primarily only in ADVANCED lung disease that ventilatory or gas-exchange limitations limit exercise capacity
- Exercise capacity is primarily limited by peripheral muscle and cardiovascular deconditioning



Pulmonary Rehabilitation:

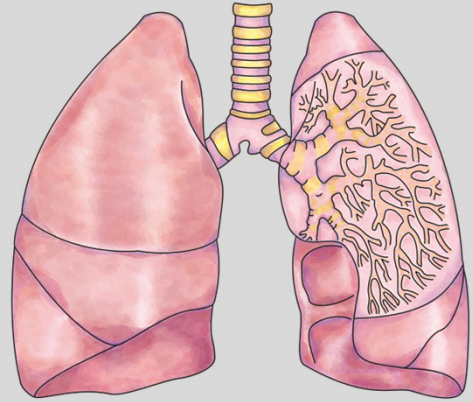
“A comprehensive intervention based on a thorough patient assessment followed by patient-tailored therapies that include, but are not limited to, exercise training, education, and behavior change, designed to improve the physical and psychological condition of people with chronic respiratory disease and to promote the long-term adherence to health-enhancing behaviors.”

~American Thoracic Society

All patient with high symptom burden and increased risk of exacerbation should be recommended to participate in pulmonary rehab
(GOLD Stage B & E)

Advanced Therapies in COPD

- **Lung-Volume Reduction Surgery:**
Upper lobe predominant emphysema
- **Bronchoscopic Lung Volume Reduction:** Performed by interventional pulmonary by placement of one-way valves
- **Lung Transplant:** Evaluation at a transplant center



★ **Palliative Care:** Symptom management