

► COPD Definition \Rightarrow

- Common, preventable, treatable (not curable) disease \rightarrow irreversible changes
- **Persistent** respiratory symptoms
- Cause by significant exposure to noxious particles & gases
- Chronic bronchitis \oplus emphysema = COPD (vary from person to person)

* 3rd leading cause of death

* more common in elderly >65

* ♀ = ♂

► Risk factors \Rightarrow

1 Smoke (most common factor)

2 Indoor air pollution $\left\{ \begin{array}{l} \text{fuel} \\ \text{cooking} \end{array} \right.$

3 occupational $\left\{ \begin{array}{l} \text{dust} \\ \text{chemicals} \\ \text{fumes} \end{array} \right.$

4 outdoor pollution (small effect on COPD)

5 Genetics (α -1 antitrypsin) \rightarrow 20-30 age

6 Age & sex $\left\{ \begin{array}{l} \text{elderly} \\ \text{♀ = ♂} \end{array} \right.$

7 Any factor affect lung growth $\left\{ \begin{array}{l} \text{low birth weight} \\ \text{respiratory infection} \end{array} \right.$

8 low socioeconomic

9 Asthma & airway hyperactive

10 chronic bronchitis

* Irritants like cigarette smoke induce an inflammation in epi. cells &

alveolar macrophages, leading to \rightarrow ① Mucus hypersecretion
chronic bronchitis

② Alveolar wall destruction
emphysema

③ Fibrosis
Bronchiolitis

*to Emphysema \Rightarrow Elastic breakdown / SOB

Chronic bronchitis \Rightarrow ciliary dysfunction & excessive mucus secretion
(\uparrow goblet size & number)

white mucoid & clear
 \uparrow
productive chronic cough

► Prevention \Rightarrow

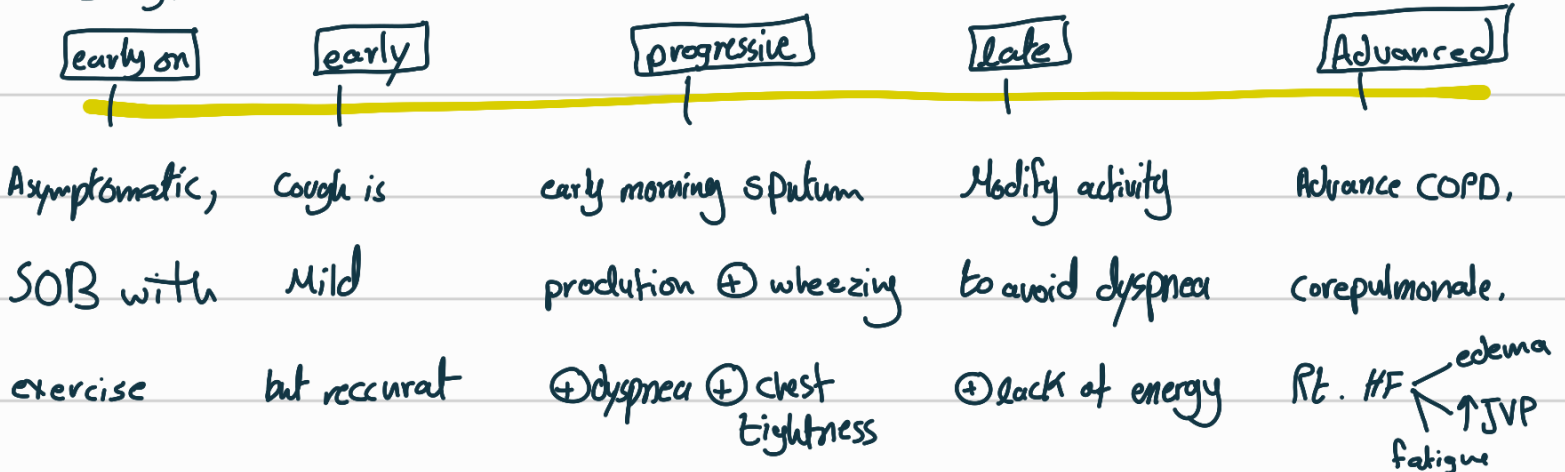
- **Primary**: - Avoid tobacco exposure / adverse effect $\left\{ \begin{array}{l} \text{active} \\ \text{passive} \end{array} \right.$ $\left\{ \begin{array}{l} \text{weight gain} \\ \text{constipation} \end{array} \right.$
- Always screen smokers for COPD even if they don't have symptoms
 \hookrightarrow they called "COPD at risk".

- **Secondary**: - Help patient to stop smoking [5As]
 - Ask (good history)
 - Advice (urge user to quit)
 - Assess (make sure that smoker willing to a quit attempt)
 - Assist (support/plan/nicotine replacement)
 - Arrange (follow-up)

• **Vaccination**: 1 Influenza vaccine
 \downarrow
every year

2 pneumococcal vaccine
 \downarrow
- PPSV23 \rightarrow age < 65
- PCV13 \rightarrow age ≥ 65

► Diagnosis \Rightarrow



► Physical examination >>

- ✓ Early no specific abnormalities, ↓ air entry, maybe vesicular breathing, wheezing may or may not be present.
- ✓ progressive → Prolonged expiratory
- ✓ Severe → **Hyperinflation**
 - barrel-shaped chest + cor pulmonale
 - ↓ breath sound
 - ↑ resonance of percussion
 - ↑ distant heart sound
- ✓ Tripod position
- ✓ Pursed lip breathing
- ✓ Tar stain

THE CLASSIC PRESENTATION OF EMPHYSEMA WITH NO "BRONCHITIC" COMPONENT

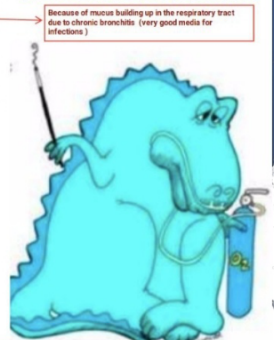
- **Dyspnea** usually is the first symptom, insidiously but it's steadily progressive
- **barrel-chested** increased on the anterior and posterior aspects of the wall
- **prolonged expiration**
- **sitting forward in a hunched-over position**, attempting to squeeze the air out of the lungs with each expiratory effort, with an obviously prolonged expiration
- **Hyperventilation**, is prominent - in early disease the gas exchange is adequate
- **adequate oxygenation of hemoglobin and prominent dyspnea**
- "pink puffers." expirations in these patients is very hard so they expire with closed lips and with time their cheeks become red
- **Cough and wheezing if coexistent asthma and chronic bronchitis.**



Pink puffers → emphysema
hyperventilation/SOB
weight loss

THE OTHER END OF THE SPECTRUM: EMPHYSEMA WITH PRONOUNCED CHRONIC BRONCHITIS AND A HISTORY OF RECURRENT INFECTIONS.

- **Less dyspnea** So they retain carbon dioxide maybe dyspnea is what activates hyperventilation??
- absence of increased respiratory drive → **hypoxic and cyanotic.**
- For unclear reasons, patients with chronic bronchitis tend to be **obese** hence the designation "**blue bloaters**"



Blue bloaters → chronic bronchitis
ventilation = cyanosis
cor pulmonale with edema

► Assessment >>

1 CAT score

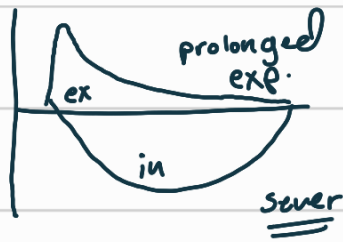
2 Gold

3 MMRC

Admission No	C	D
	A	B
	CAT < 10 MMRC (0-1)	CAT ≥ 10 MMRC (≥ 2)

► Diagnosis Test >>

*to **Spirometry**
(gold standard)
 $FEV_1 / FVC < 0.7$



*to **CXR**
Hyperinflation
flat diaphragm

► COPD vs asthma

	Asthma	COPD
Onset	Anytime (often childhood or youth)	Later in life but 20-30 in presence of α -1 antitrypsin
Etiology	Allergic, family history	Smoking, other noxious exposures
Course	Intermittent	Chronic progressive + <i>fixed</i>
Clinical features	Wheeze, episodic dyspnea, cough	Persistent dyspnea, productive cough
Pattern of Symptoms	Variable day to day, more at night/early morning	Less variable, more on exertion
Inflammatory cells and mediators	Eosinophils, mast cells, Th-2 type	Neutrophils, macrophages, Th-1 type
Response to Bronchodilators	Largely reversible <small>but asthma after 30 or 40 years becomes like COPD and remodeling occurs (irreversible)</small>	Partially reversible or irreversible
Response to steroids	Substantial	Partial

► Treatment >>

- Nonpharmacological: smoking cessation / vaccination / Treat hypoxia

Treat hypercapnia [use bipap] / bronchoscopy & surgery

- pharma:

#ICS not preferred

bcz ↑ risk for pneumonia

→ only for group D if

$eos > 300$, or everything

else failed.

** (less symptoms or more symptoms) >> has nothing to do with FEV₁
** FEV₁ is related to survival and prognosis
** Tx plan is according to ABCD grouping (symptoms and exacerbations) Not FEV₁ ... that's why we said Inhalers are for improving quality of life not Survival

Treatment of stable COPD

Group A >> any bronchodilator you can choose (SABA \ LABA \ SAMA \ LAMA)
Group B >> LABA or LAMA
Group C >> LAMA (LAMA is superior to LABA in preventing exacerbations)
Group D >> LAMA then LABA + LABA then ICS + LABA

INITIAL PHARMACOLOGICAL TREATMENT

≥ 2 moderate exacerbations or ≥ 1 leading to hospitalization	Group C LAMA	Group D LAMA or LABA + LABA* or ICS + LABA** <small>*Consider if highly symptomatic (e.g. CAT > 20) **Consider if eos ≥ 300</small>
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

→ slightly increase in SOB or cough

- Exacerbation:

• **Mild** (treated with short acting bronchodilators only, SABDs) → add it to what he's already taking (LABA or LAMA)

• **Moderate** (treated with SABDs plus antibiotics and/or oral corticosteroids) more remarkable increase and vital signs affected/hypoxia

• **Severe** (patient requires hospitalization or visits the emergency room). Severe exacerbations may also be associated with acute respiratory failure.

requires hospitalization and severe symptoms with cyanosis and tachypnea, give antibiotics as well

oral Prednisone or IV steroids \ more frequent nebulizers antibiotics