

Welcome to

New Paradigms In COPD Management



- [The COPD Conundrum](#)
- [Are We Asking the Right Questions?](#)
- [Managing the Entire Person With COPD](#)
- [Summary](#)

The COPD Conundrum

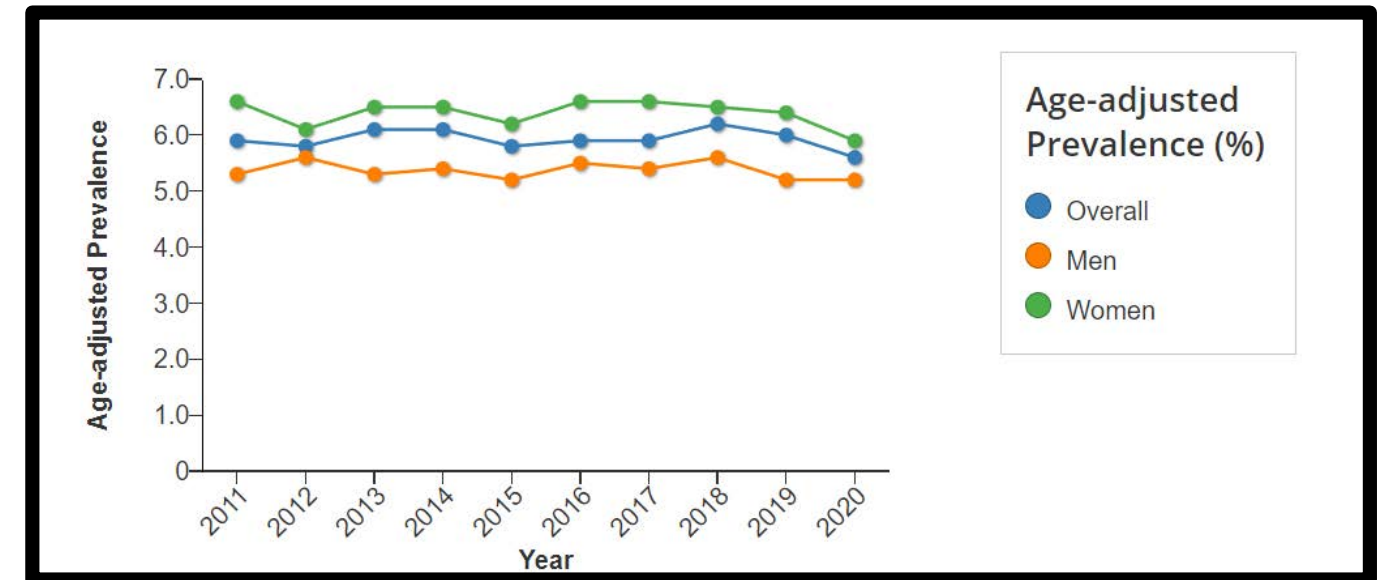


COPD

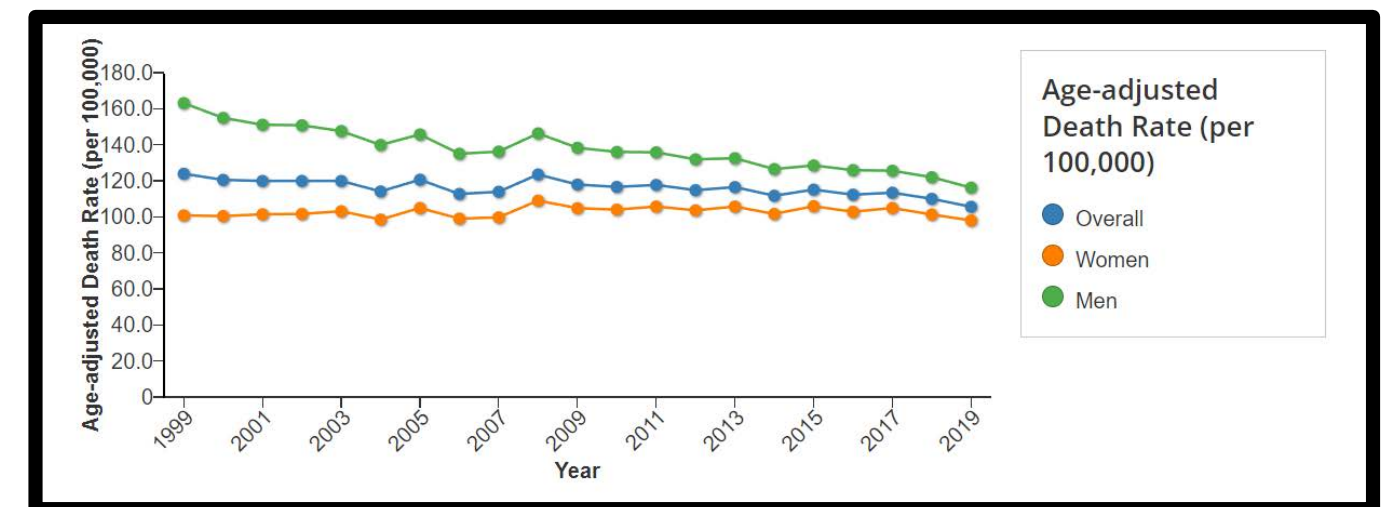
Is a Global Health Care Crisis

COPD is a major burden on the US health care system. Despite decades of research, prevalence and mortality rates have remained stagnant.

This lack of progress stands in distinct contrast to progress made in conditions such as cancer and diabetes.



<https://www.cdc.gov/copd/data-and-statistics/national-trends.html>



COPD

Is a

Global Health Care Crisis

2017

Global estimates
545 million people
have chronic lung
disease

2019

**3.3 million deaths and
74 million disability-
adjusted life years (DALYs)**
attributed to COPD

2021

Estimated
384 million individuals
affected by COPD
worldwide
1 in 10 people over 40



...leading to global \$ of COPD

expected to rise

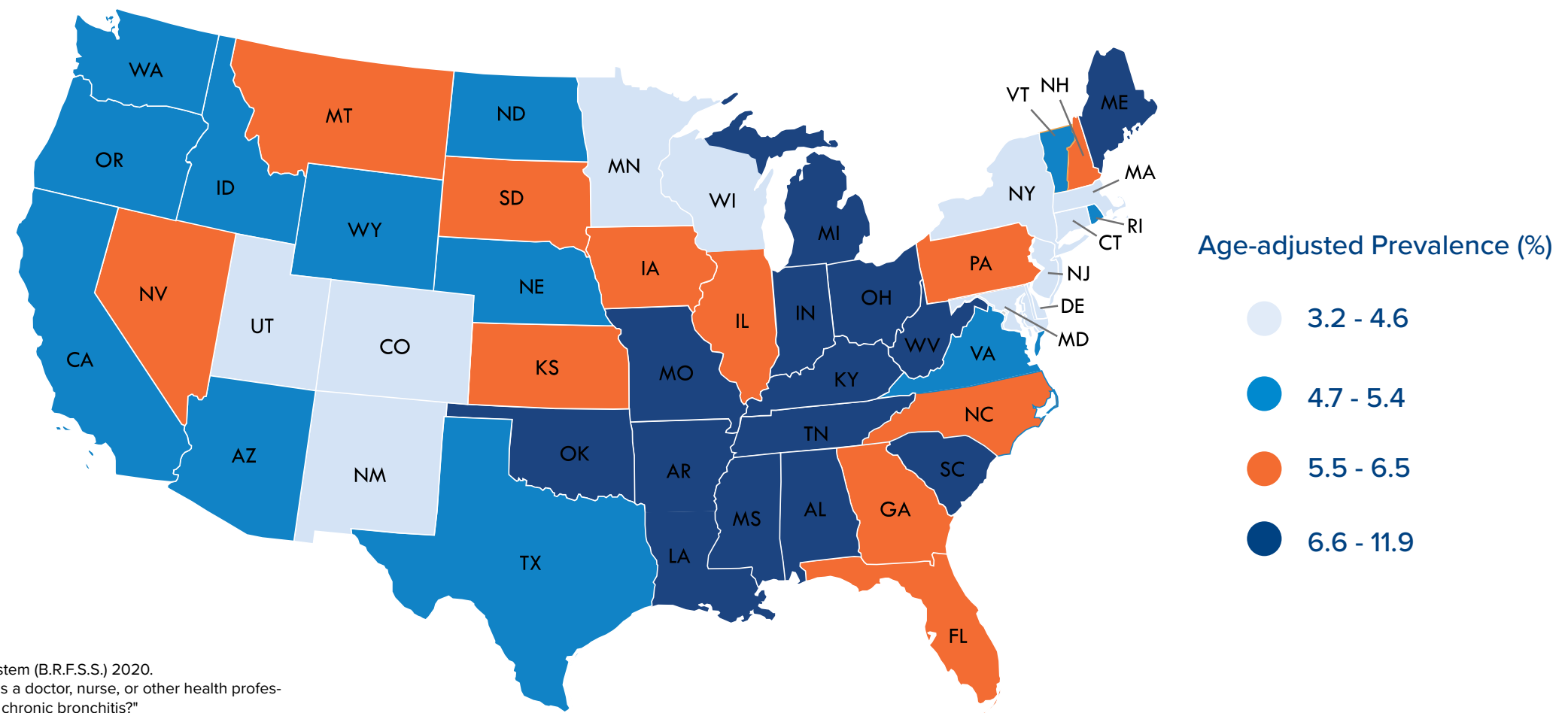
\$4.8tn in 2030.



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Age-adjusted prevalence of COPD among US adults aged ≥ 18 years - 2020

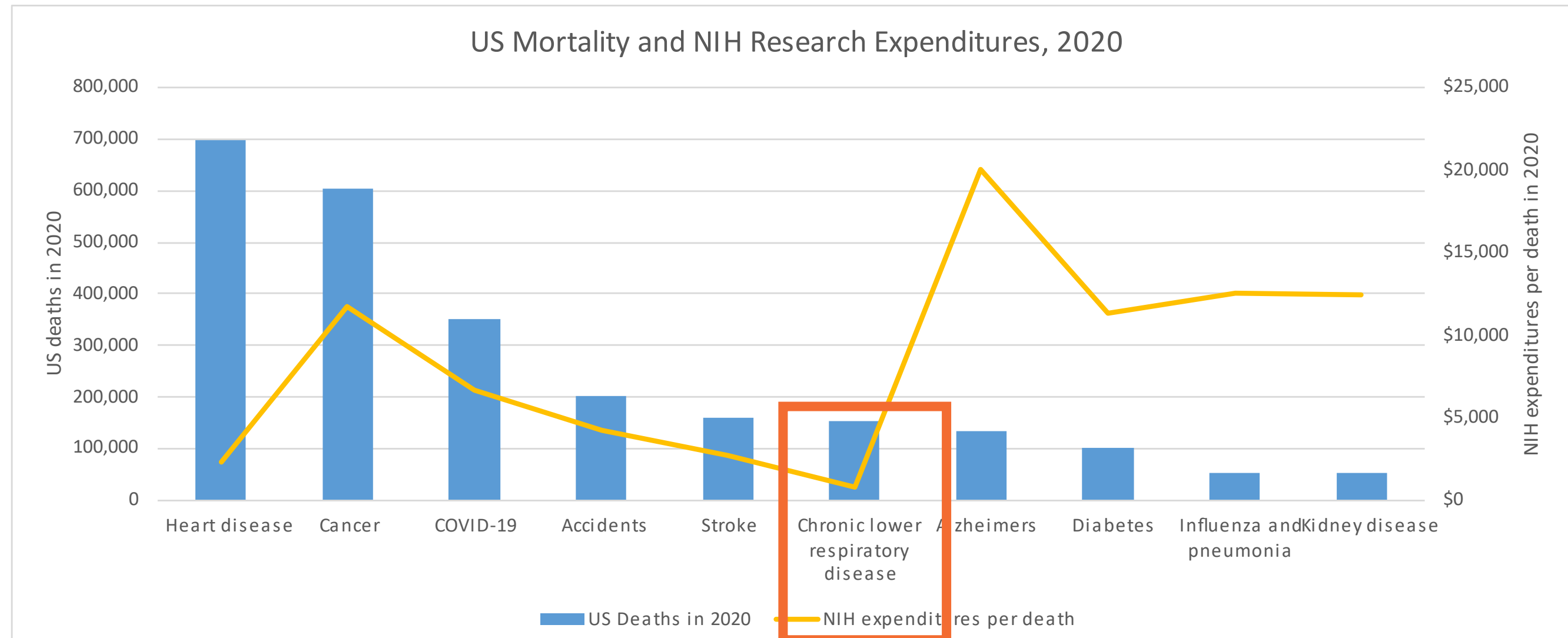
30,000,000 cases in the United States...
...but 50% are UNDIAGNOSED!



Data Source: CDC Behavioral Risk Factor Surveillance System (B.R.F.S.S.) 2020.
COPD based on affirmative response to the question, "Has a doctor, nurse, or other health professional ever told you that you have COPD, emphysema, or chronic bronchitis?"
Prevalence age-standardized to the 2000 US projected population.

COPD FUNDING

Is Under-Prioritized



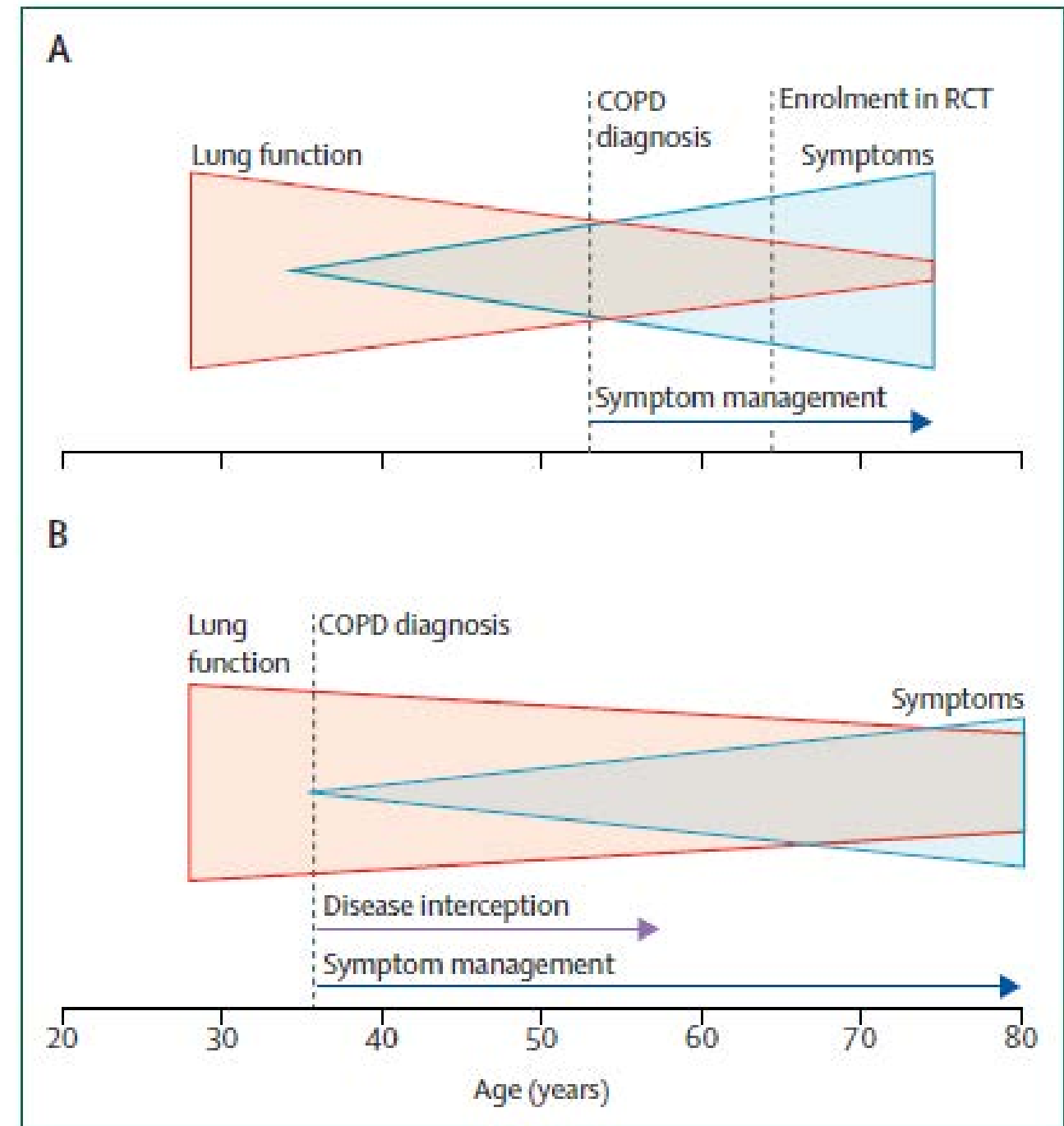
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COPD

Is Diagnosed Too Late

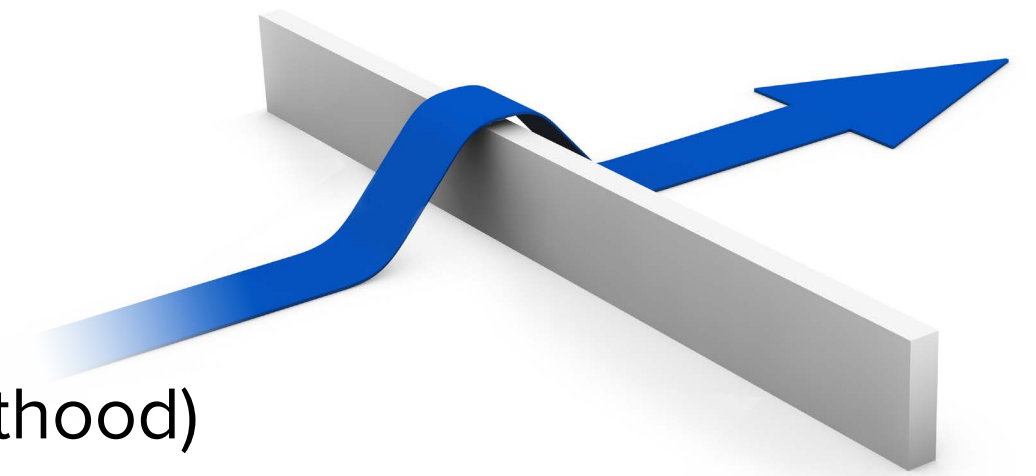
Non-smoking patients with COPD tend to be **younger** and have **less severe lung function impairment** than patients who develop COPD secondary to smoking.

Pathophysiological mechanisms related to each of these exposures **could translate into distinct diagnostic, prognostic, and therapeutic considerations.**



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Barriers Represent Opportunities



Mitigation of risk factors

- Reducing exposures and risk factors (from in utero to adulthood)
- Awareness campaigns focused on the idea that ANYONE can get COPD

Earlier identification of COPD

- New tools for screening and diagnosis of small airway disease
- Earlier interventions

New targets & drugs for disease modulation and treatment

- Person-centered approach ("Patients at the center of care, but not alone!")
- Genetic & biomarker-driven therapeutic compounds

New designs for clinical trials

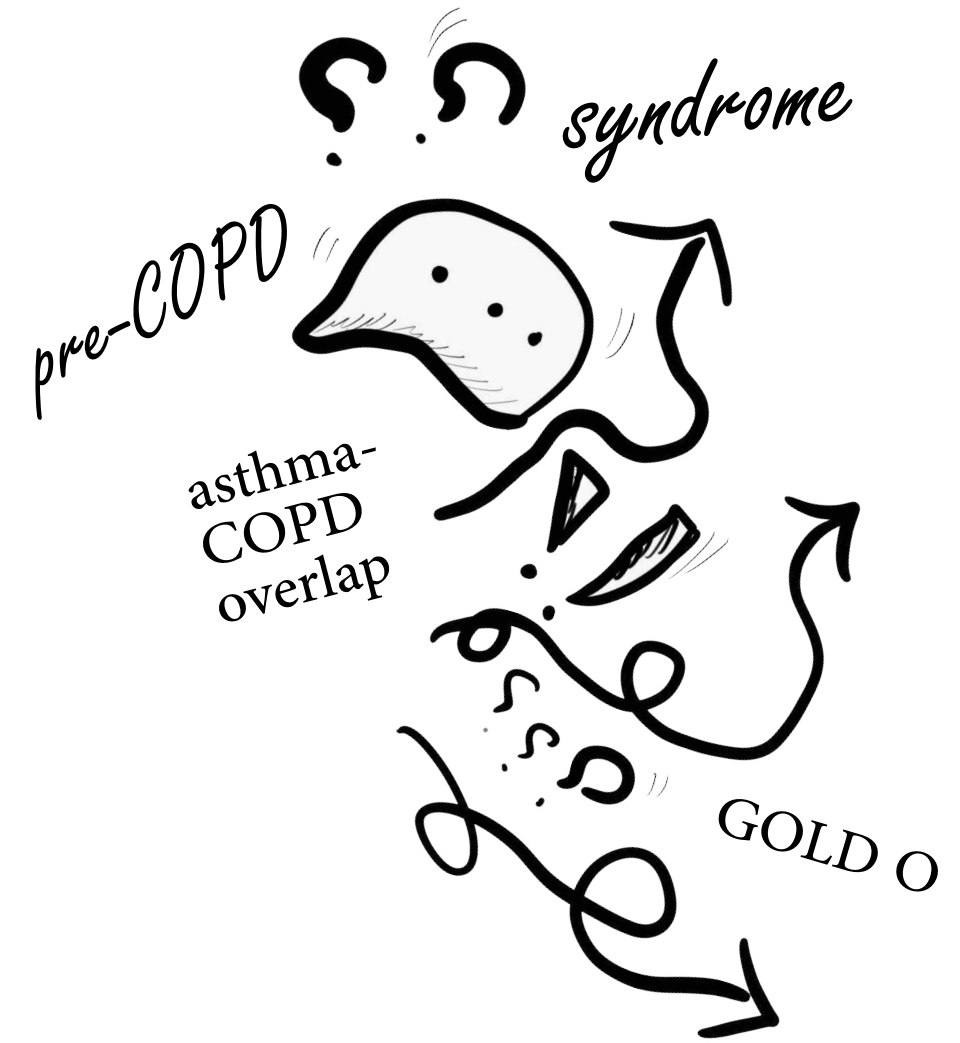
- Adaptive platform design improving participant diversity
- Remote monitoring to lower barriers and increase access

*Adapted from Stolz D et al. Towards the elimination of chronic obstructive pulmonary disease: a Lancet Commission. Lancet. 2022;400(10356):921-972.
doi:10.1016/S0140-6736(22)01273-9*

COPD-Related

Terminology Has Been In Flux

- Some versions use the concept of “GOLD 0” or “pre-COPD,” others do not.
- Some use the term asthma-COPD overlap, some call it a syndrome, others remain silent.
- Inconsistent language leads to confusion and exclusion, in both care and research!



COPD Research Is Challenging



- Lack of research funding limits evidence base.
- Relatively slow disease progression means many years to see changes in outcomes.
- Diagnostic uncertainty, coupled with a broad definition of COPD, introduces many confounding factors.



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Factors Affecting Research Confidence

What studies are done may have low levels of confidence, delaying the development and dissemination of best practice recommendations. This may be due to:

- Study design/bias.
- Lack of precision.
- Inconsistent outcomes across studies.
- Relevance/direct comparisons.
- Publication bias/missing evidence.
- Small magnitude of effect.



Making the GRADE

The Grading of Recommendations, Assessment, Development, and Evaluations (GRADE) system enables a systematic review of research to make evidence-based practice recommendations.



- It is a measure of how confident guideline authors are in the available evidence.
- GRADE is subjective, but is also transparent and consistent.



Are We Asking the Right Questions?



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Phenotypes vs. Etiotypes



- Most COPD recommendations have oscillated between viewing COPD as a “big tent” and separating out phenotypes of the condition.
- This approach has led to many being excluded from research studies, limiting confidence, confounding results, and slowing research.
- In 2022, leading voices in pulmonology suggested that looking at the genesis of an individual case of COPD may provide more insight than the presenting symptoms.

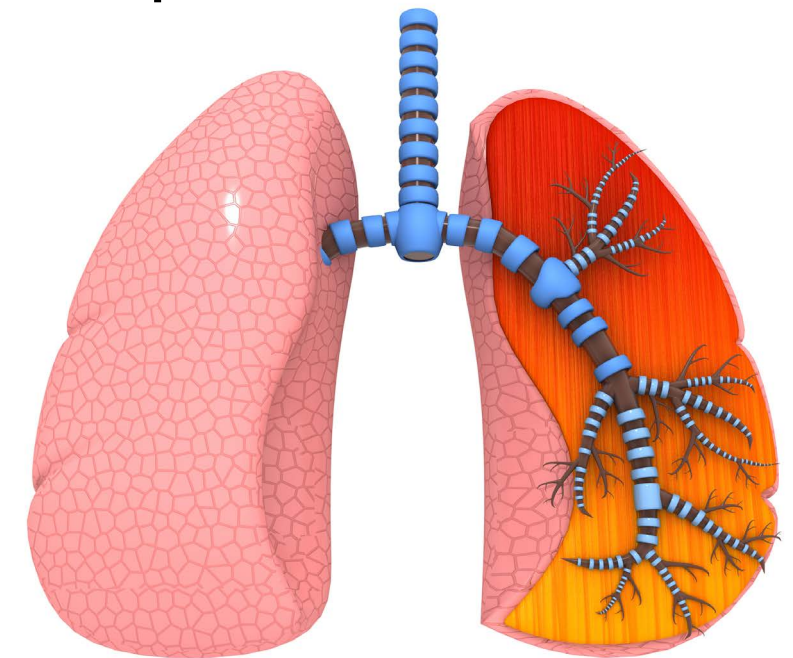


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Why Etiology Matters

Determining the etiology of a particular condition helps:

- Develop a cure
- Prevent a specific outcome
- Reduce disease progression
- Prevent disease altogether



Proposed COPD Etiotypes

The 2022 Lancet Commission on COPD and 2023 Global Strategy for Prevention, Diagnosis, and Management of COPD (GOLD) Report propose new etiotypes of COPD to guide research and treatment.

Type 1 - Genetically determined COPD (COPD-G)

Type 2 – COPD related to early-life events (COPD-D)

Type 3 – Infection-related COPD (COPD-I)

Type 4 – COPD related to smoking/vaping (COPD-C)

Type 5 - Environmental exposure related COPD (COPD-P)

Individuals are prone to multiple exposures throughout life, which could cause additive or interactive damage to lung health

Etiotype COPD-C

- COPD related to tobacco smoke.
- Generally considered the most common cause of COPD in high-income countries.
- Includes passive exposure (“secondhand smoke”), cannabis smoke, and likely electronic nicotine delivery systems (e-cigarettes).

Screening Pearls

Consider COPD-C if patient has:

- Activity limitation compared to peers/ age cohort
- Frequent shortness of breath and/or productive cough
- Radiographic evidence of emphysema or chronic bronchitis



Etiotype COPD-P

- COPD caused by exposure to airborne pollutants (especially biomass smoke).
- Leading cause of COPD in low- and middle-income countries, where biomass fuels are frequently used for heating and cooking.
- Occupational exposure to smoke and long-term exposure to air pollution are also risk factors.

Screening Pearls

Consider COPD-P if patient has:

- COPD-like symptoms with minimal to no smoking history
- Biomass fuel-using equipment in the home for heating or cooking
- Occupational history significant for possible smoke/fume exposure



Etiotype COPD-G

- COPD that is genetically determined.
- COPD-G includes the most common genetic variant leading to COPD, alpha-1 antitrypsin deficiency (AATD).
- Other mutations and epigenetic changes are thought to influence the development of COPD in adulthood as well.

Screening Pearls

Consider COPD-G if patient has:

- Significant family history of COPD and/or asthma
- Known family history of AATD
- Obstructive pattern on spirometry with or without tobacco history



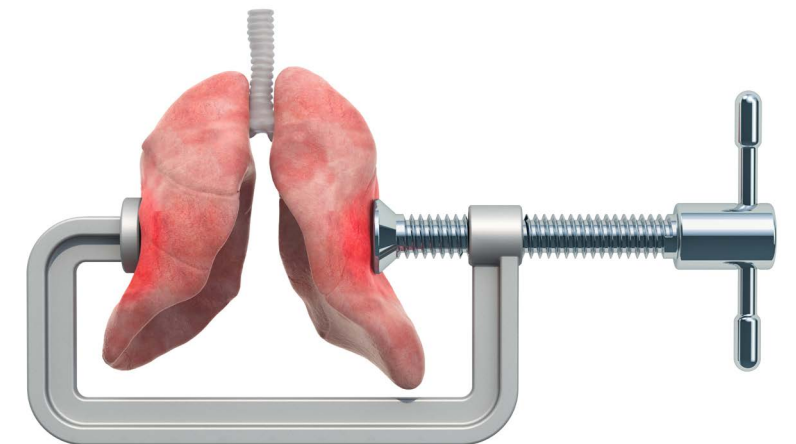
Etiotype COPD-D

- COPD related to poor early lung development.
- Many individuals born premature/with low birth weight or who are small for gestational age do not achieve predicted maximal lung function and are at risk for chronic obstruction later in life.
- Poor social determinants of health in childhood and adverse childhood events also appear to have negative effects on lung growth and development.

Screening Pearls

Consider COPD-D if patient has:

- Life-long history of breathing issues (including childhood asthma)
- History of premature birth or low birth weight
- High Adverse Childhood Experiences (ACE) score



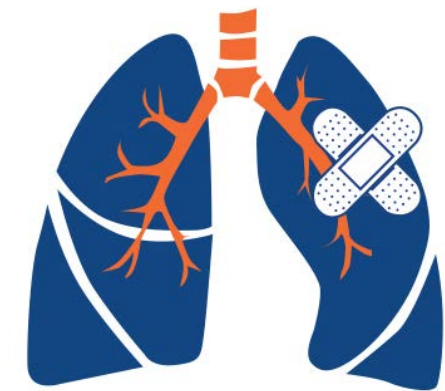
Etiotype **COPD-A** (GOLD only)

- COPD as a sequela to poorly-controlled asthma (sometimes incorporated with COPD-D).
- Suboptimal asthma control may lead to airways remodeling and therefore chronic obstruction later in life.
- Asthma and COPD are separate disease states, but may coexist in a single patient.

Screening Pearls

Consider **COPD-A** if patient has:

- Known or suspected history of asthma or reactive airways disease
- Significant seasonal respiratory allergy symptoms



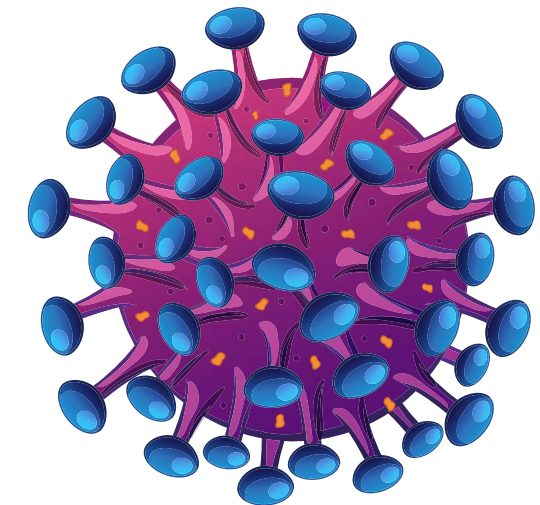
Etiotype COPD-I

- COPD related to various pulmonary infections.
- May be childhood infections, especially in individuals susceptible to repeated early childhood respiratory infections.
- HIV has also been associated with increased risk of emphysema; people with HIV and COPD have a faster rate of decline than people with COPD and no HIV infection.

Screening Pearls

Consider COPD-G if patient has:

- History of HIV, tuberculosis, or frequent childhood respiratory illness



Etiotype **COPD-U** (Gold only)

- COPD of unknown origin.
- Further research is indicated to better understand other potential etiologies of COPD.
- Some proposals also include COPD from mixed etiologies (COPD-M).

Screening Pearls

Remember that **ANYONE** can get COPD, regardless of age, tobacco history, or other factors!

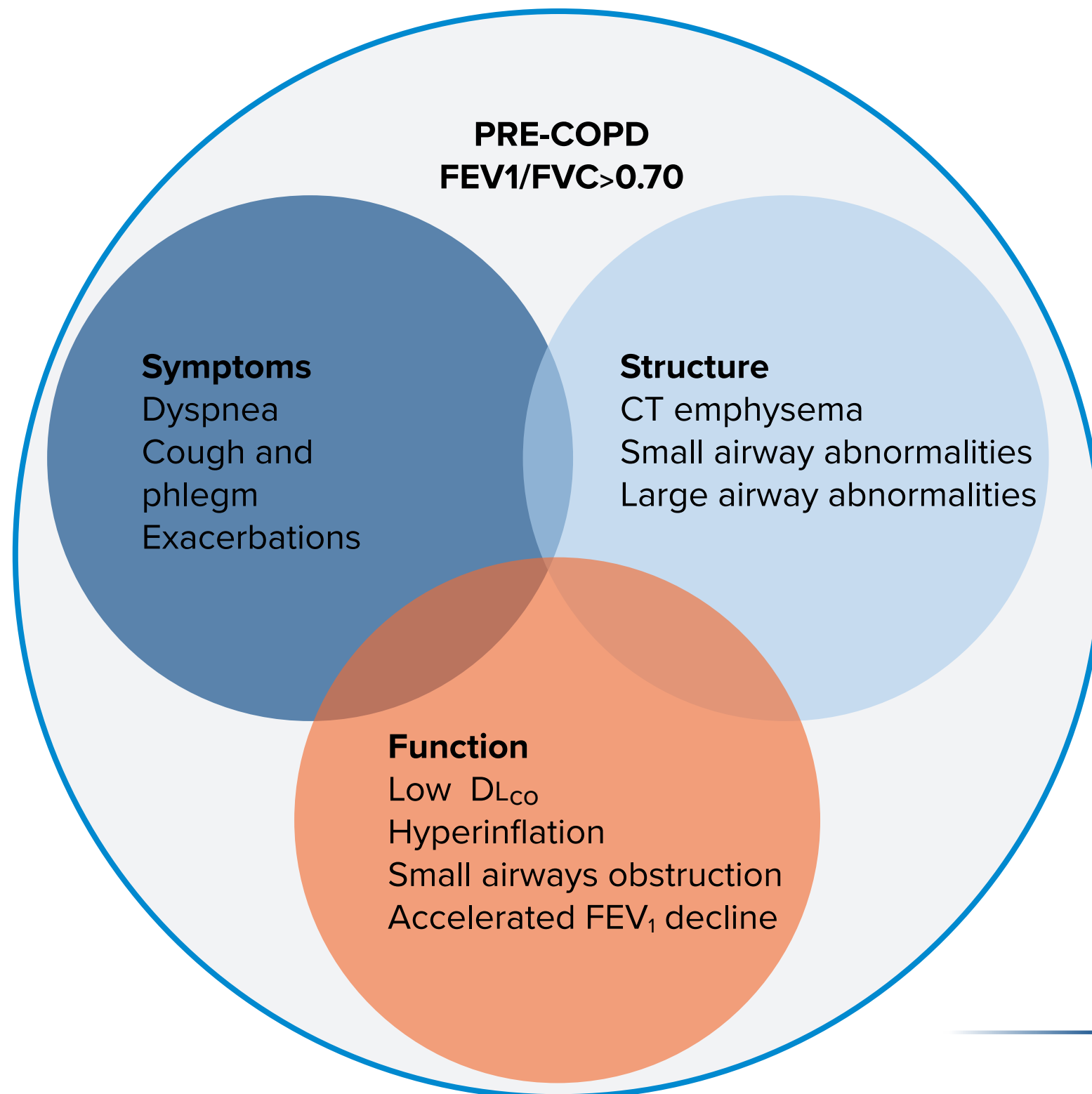


COPD Phases – Words Matter!

Historically, words like “early” and “mild” were used interchangeably to describe phases of COPD. However, it is important to define each term to help identify additional subgroups/phenotypes!

Early COPD	Mild COPD	Young COPD	Pre-COPD	Restricted
Related to the beginning of the process	Sometimes used to describe early phases of disease progression	May include patients who never achieved peak lung function	Represents patients of any age with regular symptoms or abnormalities, but no airflow obstruction	Indicates patients with normal FEV ₁ /FVC ratio but FEV ₁ < 80% predicted
Biological “early” may be different from clinical “early”	Can occur at any age, does NOT indicate initial phases of disease	May still represent severe disease, not just initial stages	Treatment should still be provided to manage symptoms	Patients may oscillate between restricted (sometimes called PRISm) and obstructed spirometry
Term should generally be avoided, unless discussing specifically biological “early”	Term should be used to represent only spirometrically measured airflow obstruction of 80-99% predicted value	Term should be used to describe patients diagnosed with COPD between 20-50 years of age	Additional research is needed to better elucidate optimal treatment options	Additional research is needed to better elucidate optimal treatment options

Pre-COPD: An Early Warning?



- Many people with risk factors and certain symptoms are at higher risk to develop COPD eventually
- The concept of “pre-COPD” may be helpful to facilitate earlier intervention and improved research opportunities

Adapted from Han MK et al. From GOLD 0 to Pre-COPD. Am J Respir Crit Care Med. 2021;203(4):414-423. doi:10.1164/rccm.202008-3328PP

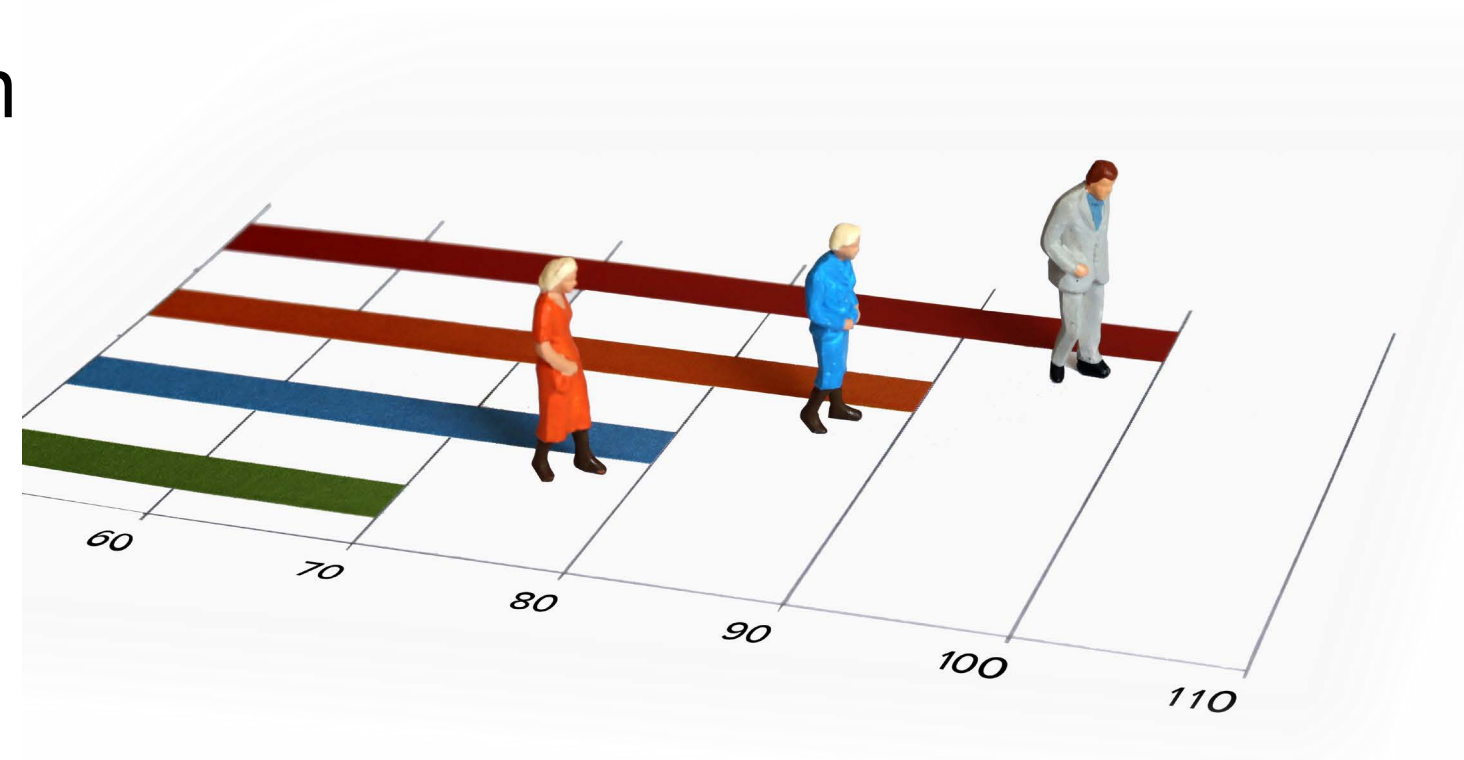


Managing the Entire Person with COPD

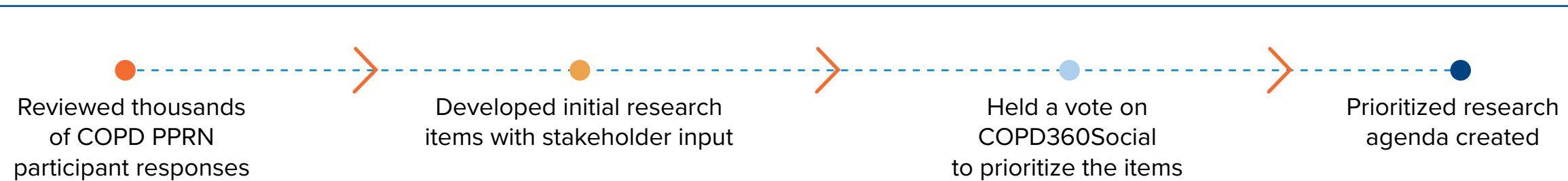


Tenets of COPD Management

- Reduce the risk of acute exacerbation
- Improve activity tolerance
- Minimize symptom burden/maximize quality of life
- Manage concurrent conditions
- Prolong lifespan



Prioritizing What Is Important to Patients



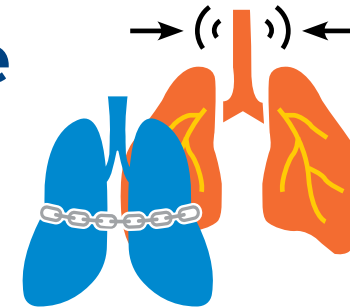
WHAT ARE THE RESULTS?

Reverse/
CURE
COPD

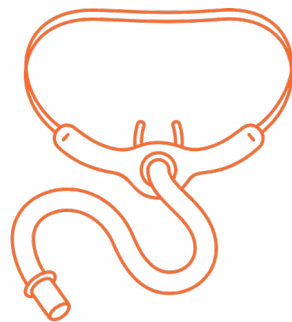


Better drugs
for shortness of
breath and flare ups

Improve
symptoms



Improve
medical
equipment and
Increase
access



Improve
mobility
and
independence



Reduce
anxiety, fear and
depression



In 2021, the COPD Foundation published results from a study examining main priorities for people living with COPD in order to develop a patient-focused research agenda.

Adapted from Grub I et al. Developing a patient-driven chronic obstructive pulmonary disease (COPD) research agenda in the U.S. J Patient Rep Outcomes. 2021 Dec 4;5(1):126. doi: 10.1186/s41687-021-00399-7

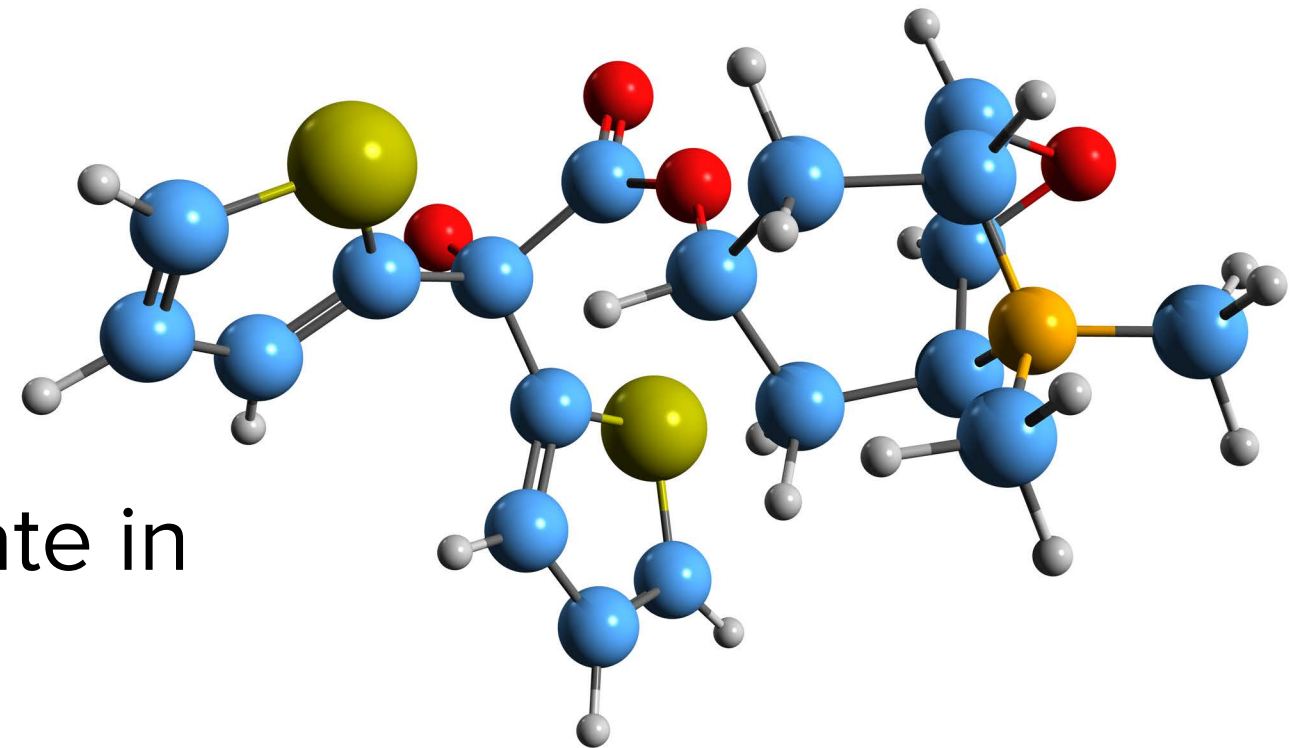
Basic Pharmacological Management

Primary therapy is inhaled long-acting bronchodilators

- Long-acting Beta₂ agonists (LABAs)
- Long-acting muscarinic antagonists (LAMAs)

Inhaled corticosteroids **MAY** be appropriate in **SOME** cases

- Frequent exacerbations
- High eosinophil count
- Asthma-type symptoms



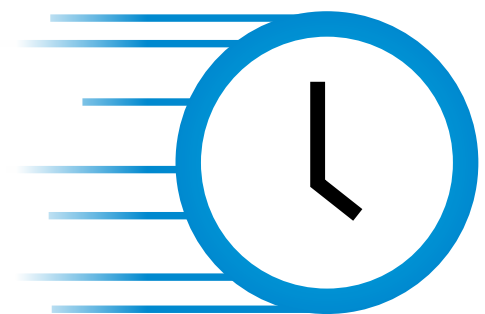
The Inhalation Route Is Preferred for Most Pulmonary Medications¹

Delivery via the inhalation route allows medications to be delivered directly to the entire respiratory tract.

This allows medication molecules to be delivered directly to the site of action, allowing for:



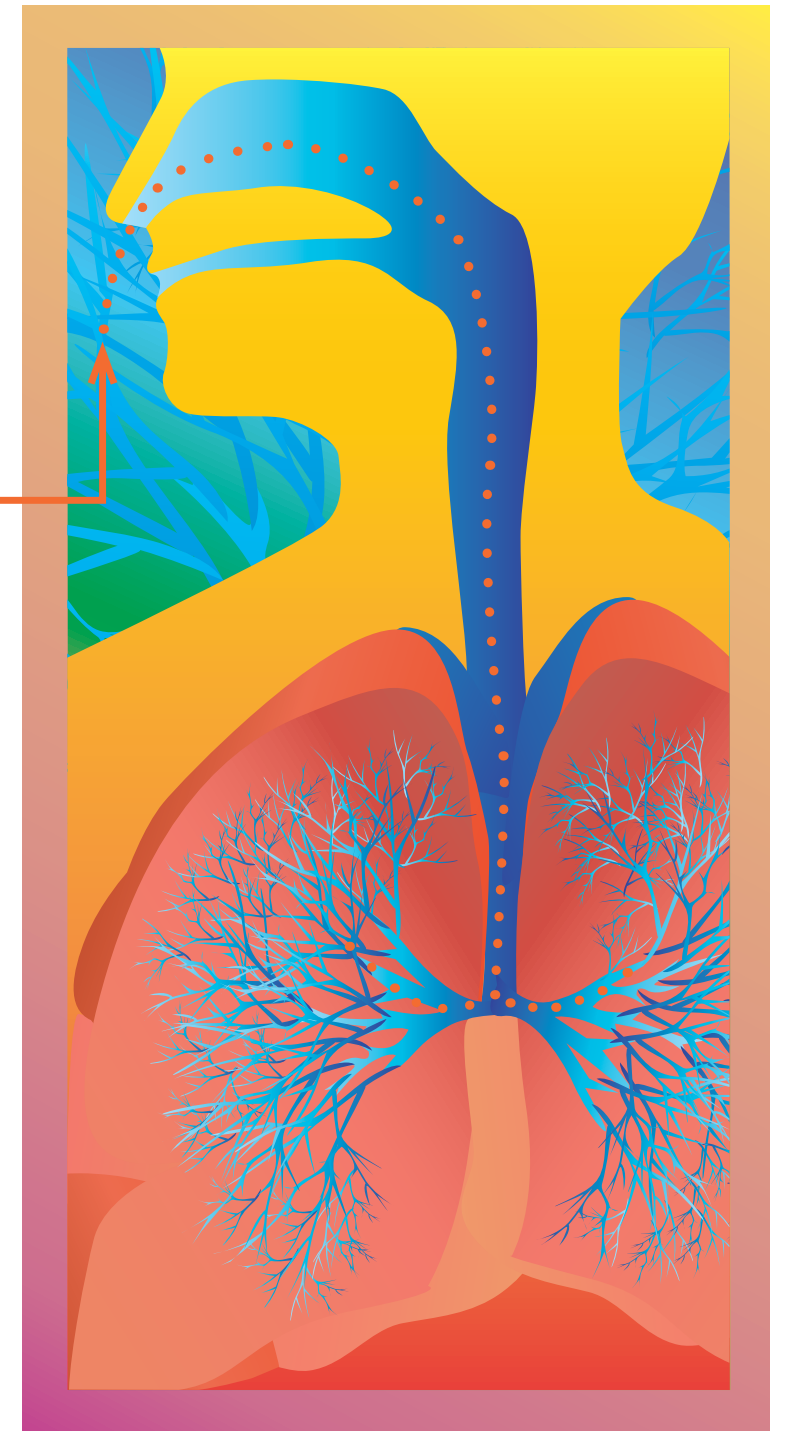
Less medication per dose



Fast onset (potentially)



Fewer systemic effects (usually)



Other Pharmacological Tools

- **Vaccines (for all patients)**
- Antibiotics (during acute exacerbations)
- Oral corticosteroids (during acute exacerbations)
- PDE-4 inhibitors (for frequent exacerbations)



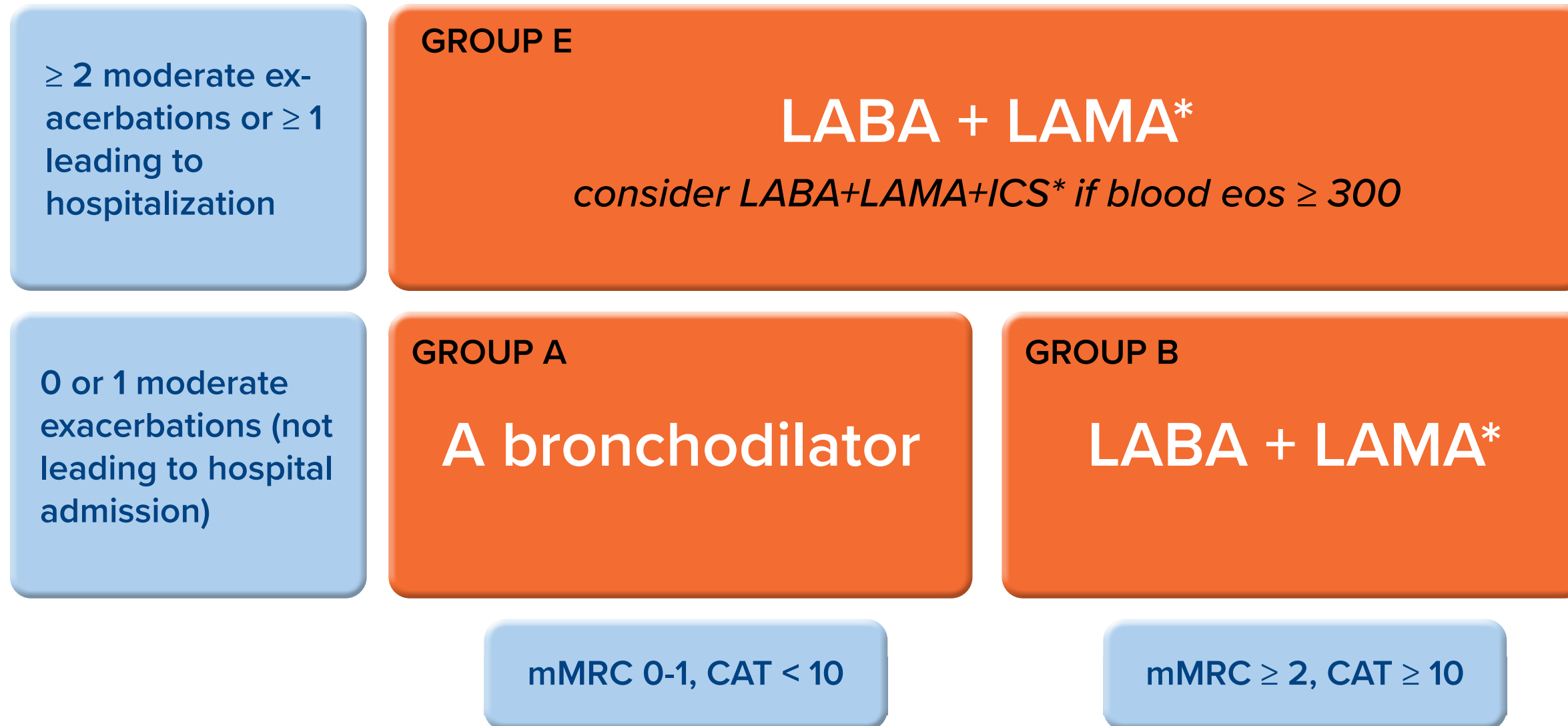
NOTE: Macrolide antibiotics are sometimes used in chronic management to reduce inflammation and exacerbation risk. However, this is an off-label usage.

Medication Reconciliation

- People with COPD may require 3 or more medications simply to manage their lung health.
- Additional comorbid conditions add to the complexity of medication regimens
- Accurate, consistent, and regularly-updated medical records of prescriptions (and over-the-counter supplements) is essential for safety!



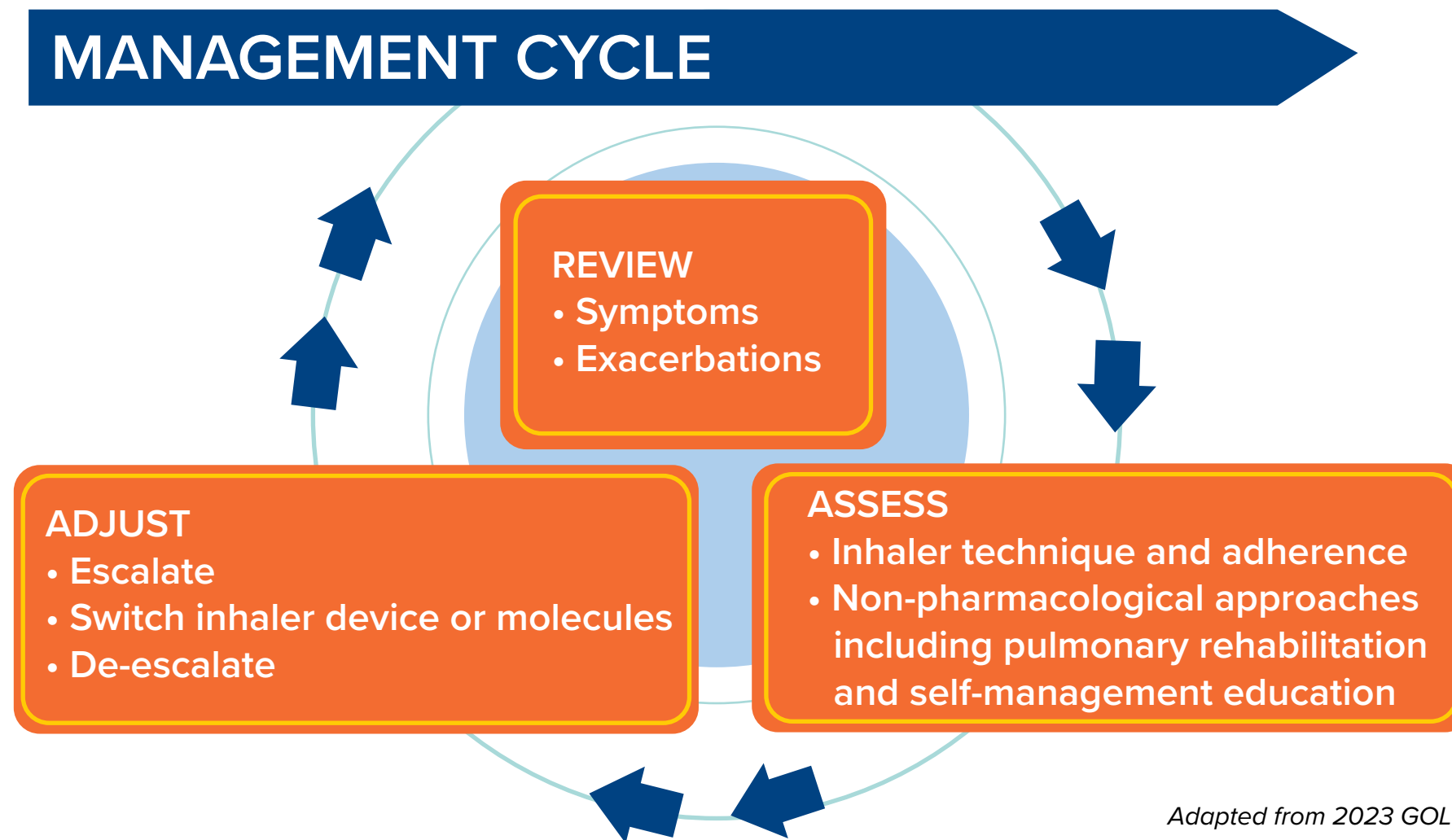
Initial Pharmacological Treatment



*single inhaler therapy may be more convenient and effective than multiple inhalers

Adapted from 2023 GOLD Strategy Report

Ongoing disease management is essential to providing optimal outcomes for your COPD population. Review symptom burden and exacerbation history regularly, & assess adherence to all therapies before making any adjustments. However, do not hesitate to switch to therapies better aligned with your patient's needs, abilities, and goals!



Non-Pharmacological Therapies - Exercise

All patients should begin with structured pulmonary rehabilitation!

- 12-week program of monitored exercise.
- Disease management & self-efficacy training should be included.
- Peer support is crucial.



After completion of initial program, all patients should be encouraged to remain active to their maximum capacity with lifestyle modifications:

- Ongoing “maintenance” programs.
- Virtual programs are available, but may be less beneficial.
- Adjunct programs like Harmonicas for Health provide socialization & support.

Non-Pharmacological Therapies - Oxygen

- Long-term oxygen therapy (LTOT) can improve survival in those with severe resting hypoxemia (oxygen saturation of <88% by pulse oximetry).
- LTOT may be helpful in other settings, but the evidence is less conclusive.
- Patients should be evaluated while considering their home environment. For example, if they live in a multistory building, their saturation should be measured while climbing stairs.
- Equipment is often complicated and not matched to patients' abilities/goals. See COPD Foundation's [Oxygen Therapy Basics](#) guide for more.

Interventional Procedures

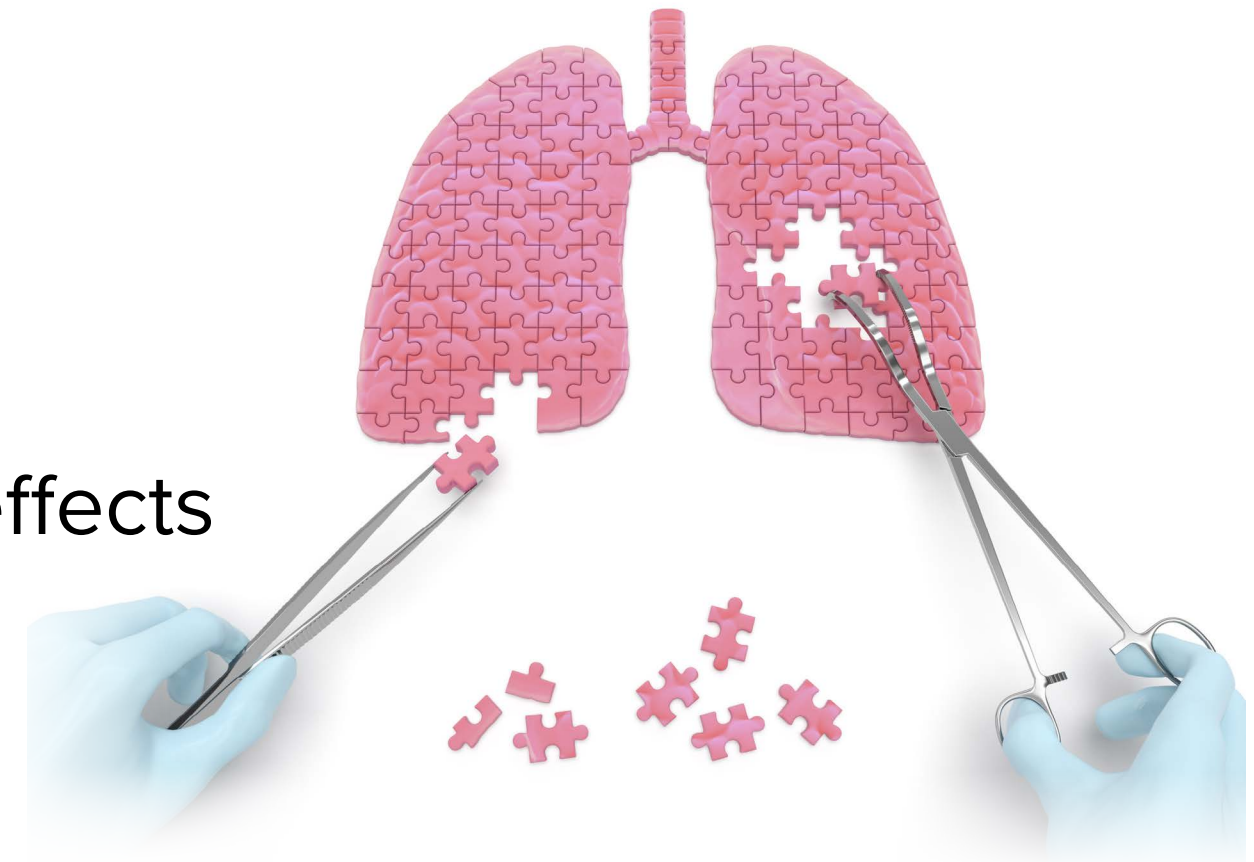
Bronchoscopic lung volume reduction (BLVR)

- Creates intentional, targeted atelectasis of hyperinflated tissue
- Requires no incision
- Reversible in the event of serious adverse effects

Lobectomy

- Surgical removal of damaged lung lobe
- Invasive surgery, risk of infection and complication

Lung transplantation



Behavioral Health Interventions

Medication adherence

- **“Drugs don’t work in patients who don’t take them” –
*C. Everett Koop, former surgeon general***
- Inhaled medication regimens can be complicated, especially considering frequency of comorbidities (leading to polypharmacy)
- Inhaler technique is often suboptimal, leading to unintentional nonadherence
- Technique and adherence should be evaluated at every encounter (especially before escalating therapy)



Behavioral Health Interventions

Smoking/Vaping cessation treatment

- **All patients who continue to smoke should receive treatment!**
- Best strategies involve both pharmacological intervention (nicotine replacement, neuroactive) and counseling/support.
- Treatment should include motivational interviewing, shared decision-making, and be respectful of patient needs/values/goals.



Behavioral Health Interventions

Diet and nutrition education

- An essential but often-overlooked component of COPD management.
- Evidence is lacking in many areas.
- Someone with COPD may be overweight due to low activity or underweight due to high baseline metabolic demand.
- A personalized approach is key to success; consider referral to a registered dietitian to optimize success.



Behavioral Health Interventions

Anxiety and depression management

- Feelings of shame and guilt are common!
- Many believe, “I did this to myself.”
- Activity intolerance may lead to isolation and self-exclusion.
- Peer counseling (through pulmonary rehabilitation and/or support groups) is extremely helpful.



Behavioral Health Interventions

Intimacy concerns

- Intimacy and sexuality are essential to optimizing quality of life in later life.
- Many with COPD fear disappointing their partner or becoming unattractive to them due to their condition.
- Partners are often concerned that sexual activity could be harmful or worsen symptoms.
- Many may be reluctant to share such personal concerns, so proactive communication is necessary.
- Tools are available to help facilitate communication and develop strategies to facilitate intimacy.



Managing Comorbid Conditions

- The vast majority of people with COPD have at least 1 comorbid condition, and up to half have 3 or more. (Hillas)

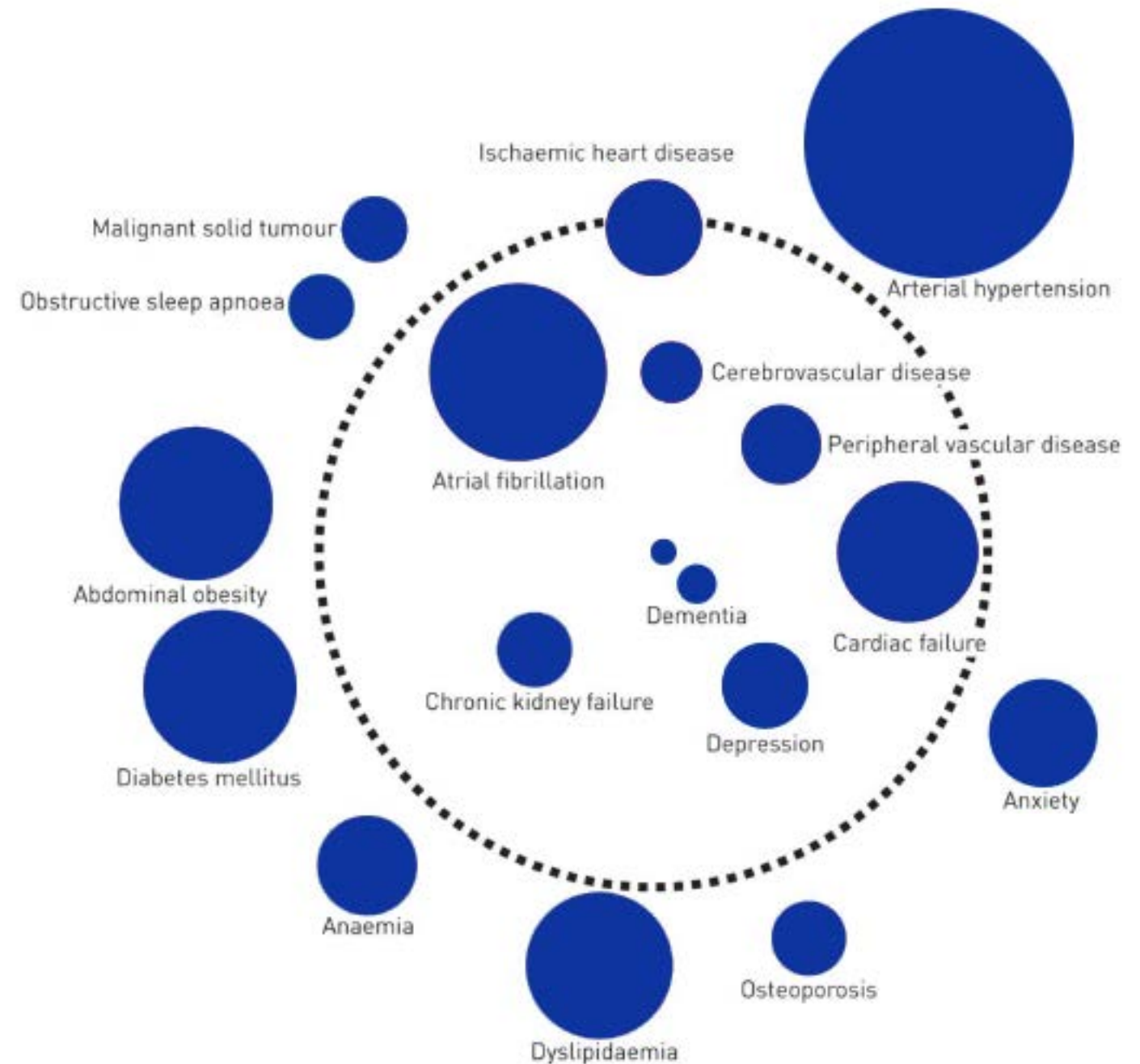
Hillas G et al. Managing comorbidities in COPD. Int J Chron Obstruct Pulmon Dis. 2015;10:95-109. Published 2015 Jan 7. doi:10.2147/COPD.S54473

- Systemic inflammation appears to be a common thread with many COPD-associated comorbidities
- Not only can conditions modify the course of COPD (and vice versa), treatments can also impact those conditions
- An integrated, collaborative approach between health care professionals and the patient/caregiver team is therefore essential for optimal management

The “COPD Comorbidity Dome”

The relative size of each circle represents the prevalence of that condition in the COPD population. Distance from the center of the circle represents the relative risk of death from that condition. Conditions statistically demonstrated to increase mortality in COPD are within the dotted circle.

Adapted from Almagro P et al. Comorbidity dome and short-term prognosis in hospitalised COPD patients: the ESMI study. Eur Respir J. 2015;46(3):850-853. doi:10.1183/09031936.00008015



Managing Acute Exacerbations

of **COPD**

Exacerbations are a frequent part of life with COPD. They can be triggered by many causes, but often follow similar pathways.

Exacerbation Causes



Bacteria/Virus

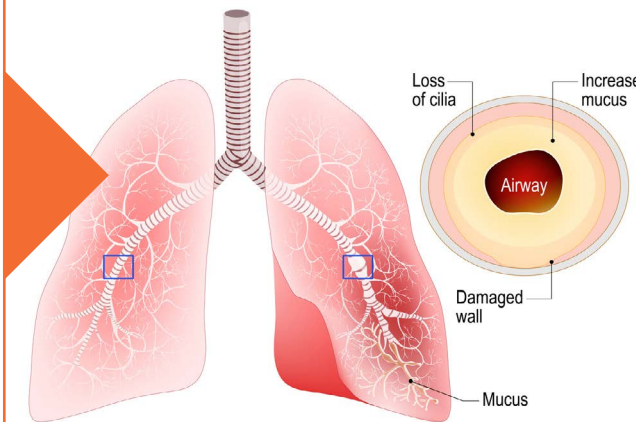


Pollution

? OTHER

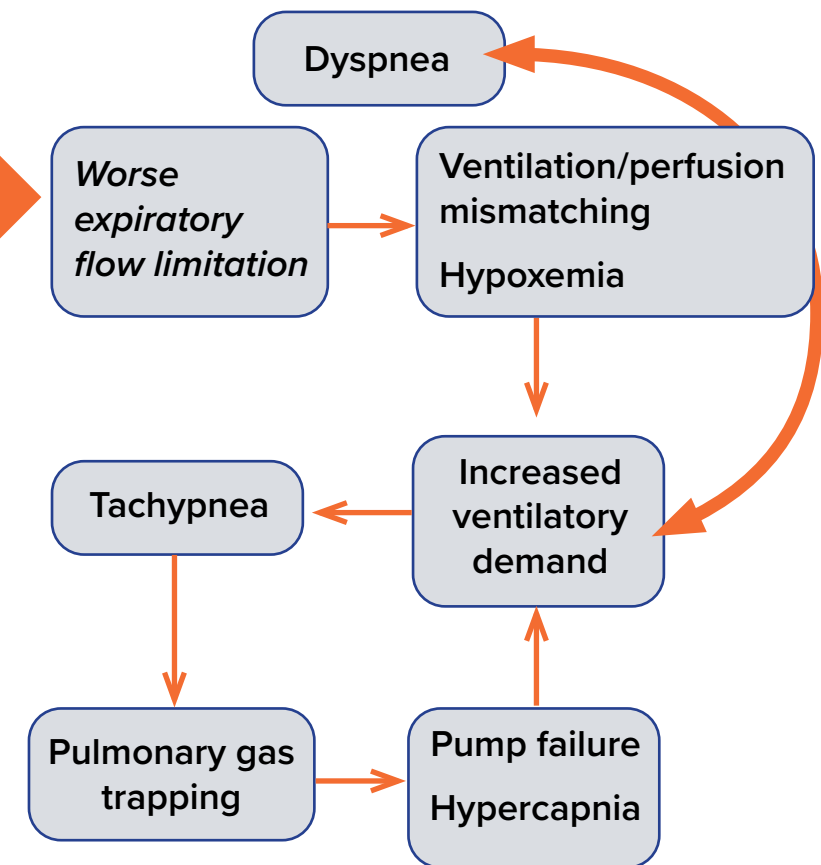
Pathobiology

Airways inflammatory burst



CRP

Pathophysiology



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Managing Exacerbations

Action plans can help determine when a change in symptoms exceeds an individual's baseline variance and becomes an acute exacerbation.

Action plans can provide clear reminders and instructions on how to proceed.

A written action plan is important because it empowers patients to better manage their symptoms.

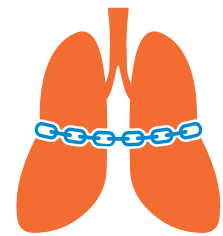


Exacerbations

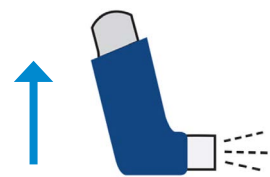
Key early warning signs



Changes in mucus color, consistency, or amount



Increased dyspnea (at rest or with activity)



Increased short-acting medication usage



Increased fatigue

Other potential indicators



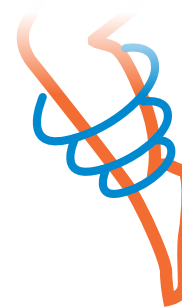
Headaches/dizziness



Fever



Increased pulse rate

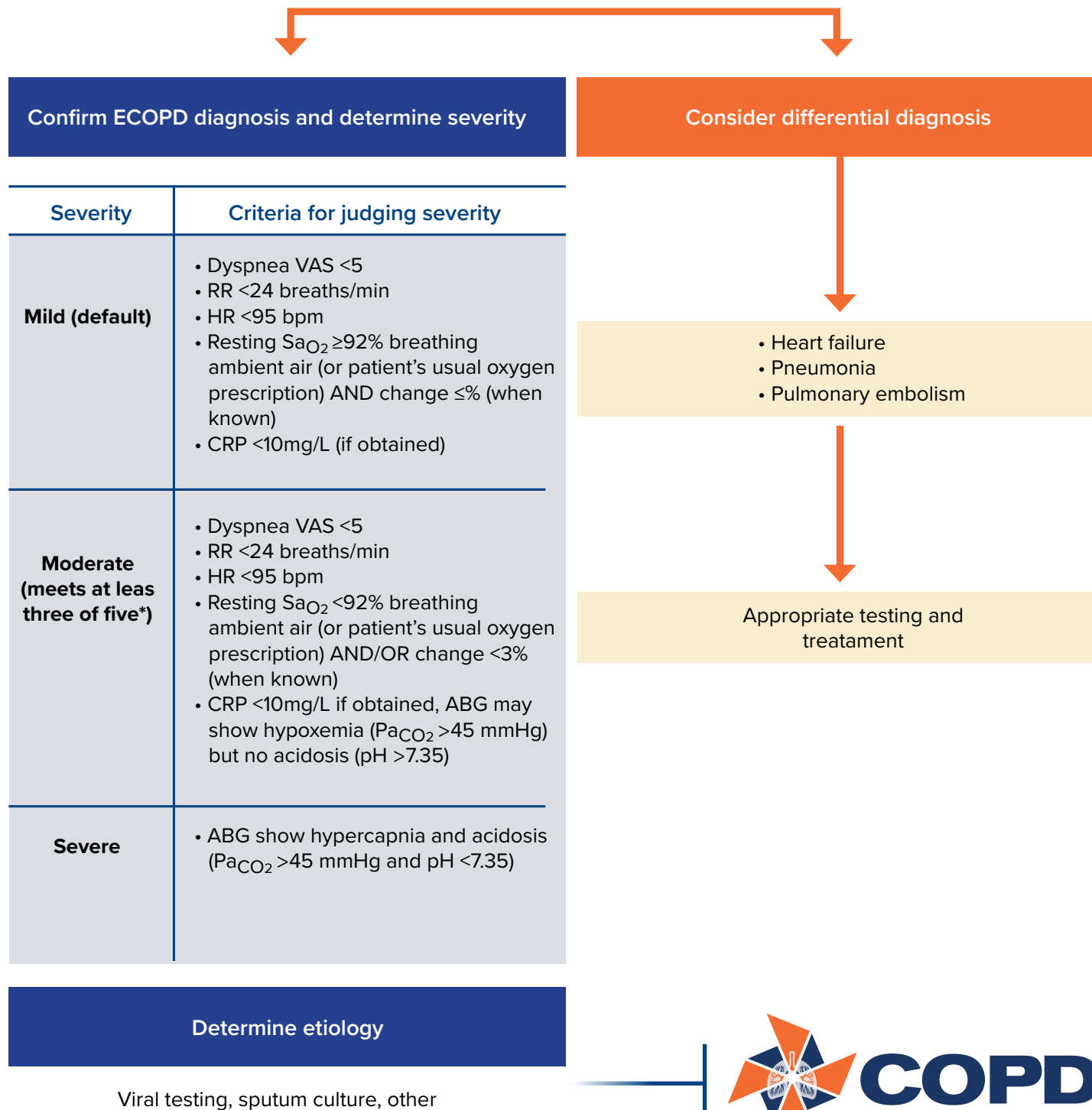


New/increased edema in lower extremities



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Exacerbation Severity



- A staging system for grading exacerbation severity (and therefore managing treatment venue and strategy) has been proposed.
- This new definition and algorithm covers many shortcomings of existing definitions but remains unvalidated.

Adapted from Celli BR et al. An Updated Definition and Severity Classification of Chronic Obstructive Pulmonary Disease Exacerbations: The Rome Proposal. Am J Respir Crit Care Med. 2021;204(11):1251-1258. doi:10.1164/rccm.202108-1819PP

General Management of Exacerbations

Maximize
bronchodilator
therapy

Consider antibiotic therapy
if dyspnea AND sputum
production are increased

Consider corticosteroid burst

Consider increased
oxygen therapy



Helping Plan for the End

Palliative Care

- Should be made available at ANY stage of therapy, not just with advanced or terminal symptoms
- Interprofessional teams are vital, especially for those who experience frequent exacerbations and/or hospitalizations
- May include complimentary and alternative medical approaches depending on patient/caregiver values and goals
- Should include advanced care planning, including decisions about ventilation (invasive or noninvasive), transplantation or other surgeries, and end-of-life preferences



Helping Plan for the End

Hospice Care

- Care decision focus shifts from life prolongation to symptom management and quality of life
- Variability in progression often prevents quality discussion on end-of-life goals
- People with COPD are more likely to have no EOL orders on file than those with terminal lung cancer, leading to futile resuscitation attempts
- Early discussions about values, desires, and goals are absolutely essential!

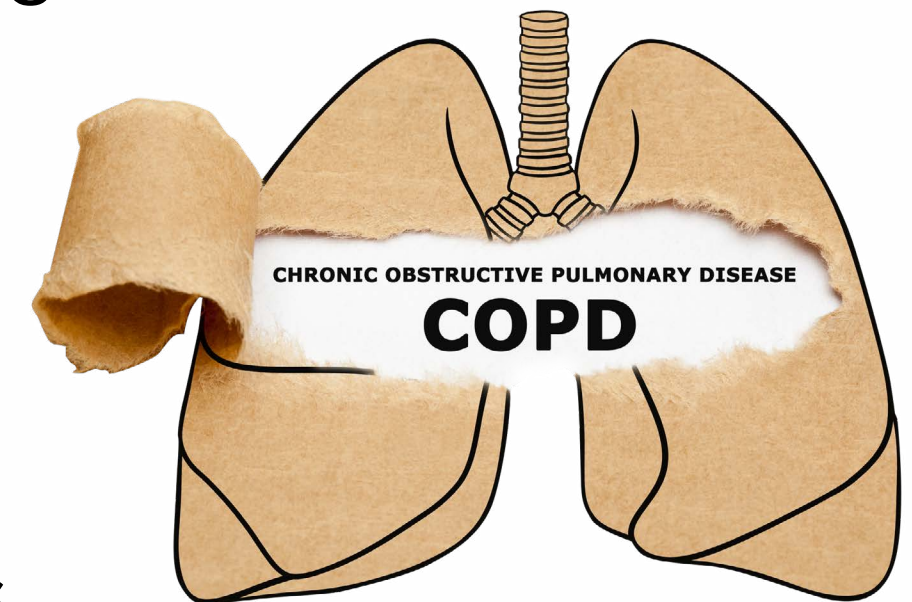


Summary



ANYONE Can Get COPD!

- COPD can no longer be considered a “smoker’s disease” or a condition associated with advanced age.
- Even in the absence of measurable airways obstruction or severe symptoms, underlying pathological changes may still be occurring.
- People at risk for COPD due to early-life risk factors, infections, or occupational/environmental exposures should be carefully monitored for pre-COPD.



COPD Is A “Whole Person” Problem

- The pathophysiology of COPD is rooted in the lungs but affects the entire body.
- Systemic inflammation related to COPD may be the cause of other organ dysfunction.
- Other chronic conditions may interact unexpectedly with COPD.
- Social and mental health issues must also be addressed to care for the entire person.



Unanswered Questions Remain

- How do we best screen for and diagnose COPD etiotypes?
- How can we improve medication access and delivery?
- How can we improve access to important medical equipment such as oxygen delivery devices and noninvasive ventilators?
- How do we foster innovative research and development in this space?

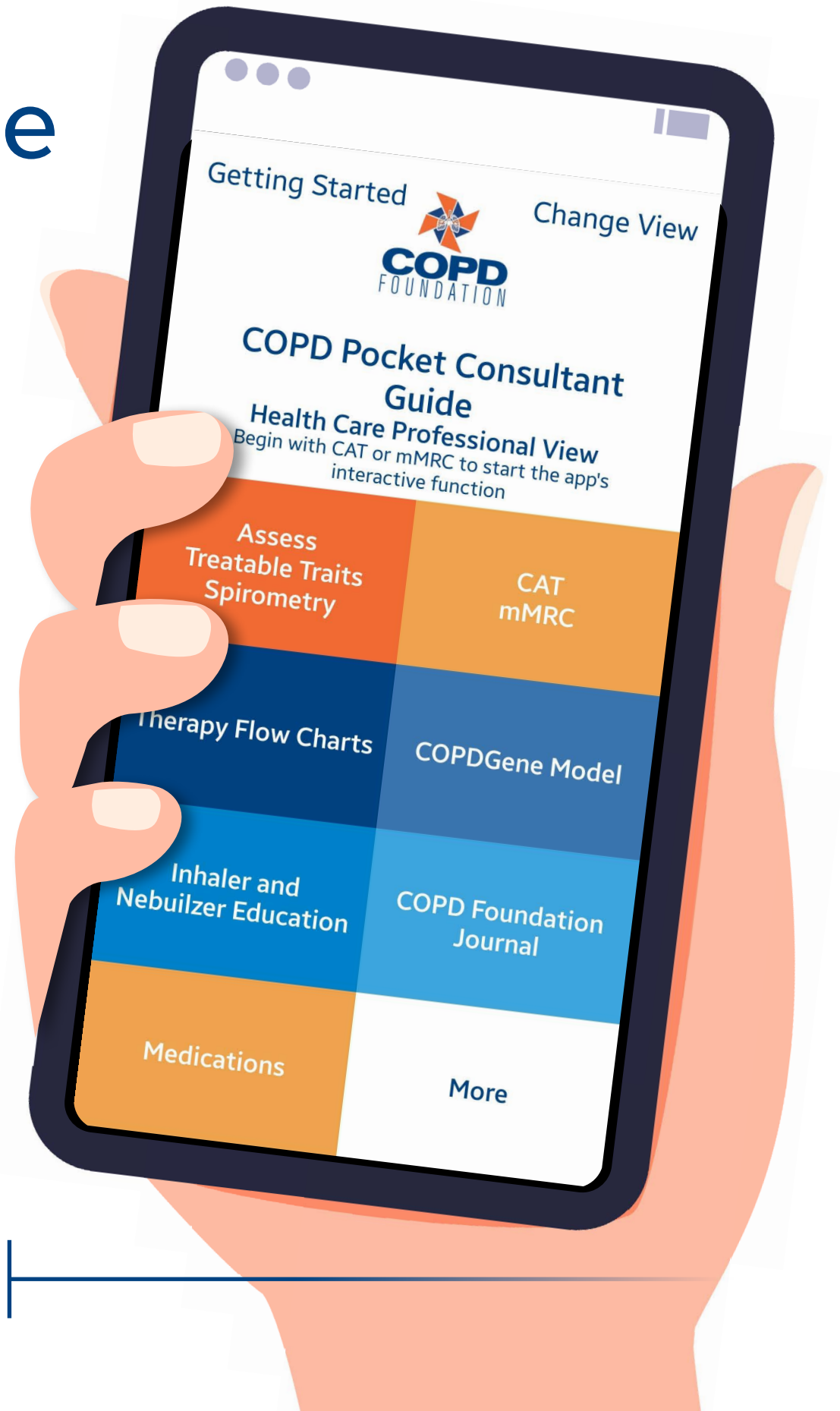


Additional Resources



COPD Pocket Consultant Guide

- Free
- Available for [iOS](#) and [Android](#)
- Contains both Provider View & Patient/Caregiver View to facilitate communication



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Gold Strategy Report

The Global Initiative for Chronic Obstructive Lung Disease (GOLD) publishes an annual report with the latest research updates and therapy recommendations.

<https://www.goldcopd.org>



ATS/ERS Clinical Practice Recommendations

The American Thoracic Society (ATS) and European Respiratory Society (ERS) have a number of clinical practice guidelines and other recommendations for diagnosis and management of COPD.

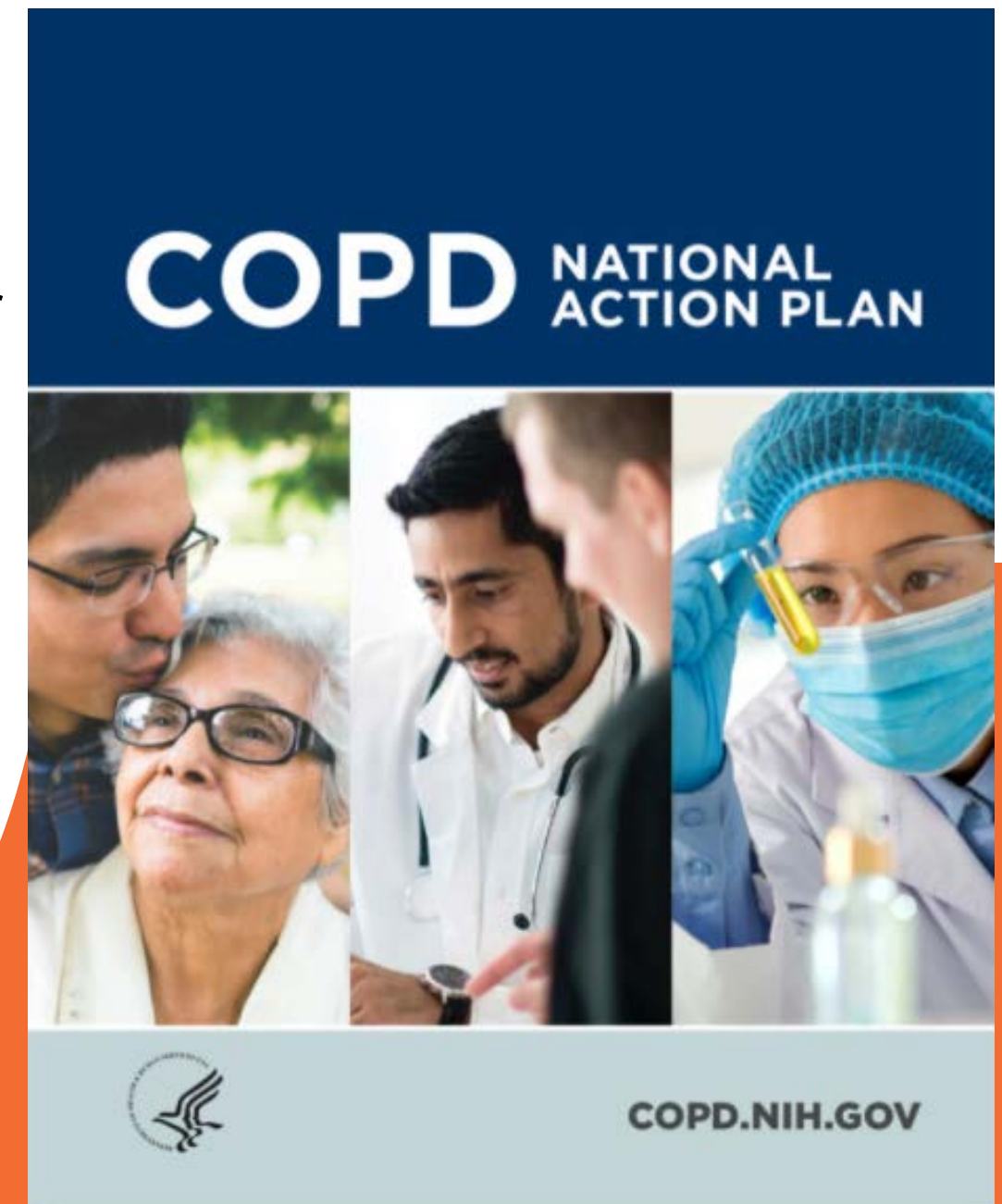
<https://www.thoracic.org/statements/copd.php>



NIH COPD National Action Plan

A multifaceted “blueprint” to reduce the impact of COPD on individuals and the healthcare system.

<https://copd.nih.gov>



Patient Resources



What is COPD?

Chronic obstructive pulmonary disease (COPD) is a term used to describe chronic lung diseases including emphysema and chronic bronchitis. COPD is characterized by breathlessness. Some people with COPD also experience tiredness and chronic cough with or without mucus. Let's break down this complicated name into smaller pieces:

C

HRONIC

This means this disease is not curable. The symptoms of COPD may take years to develop. Symptoms can vary from person to person and they may be more or less severe at times. It is important to remember that while COPD isn't curable, it is treatable.



BSTRUCTIVE

This means that the airflow through your lungs is blocked (obstructed). This can be caused by swelling and extra mucus in the tubes inside your lungs. These airways are called bronchial tubes. They look like the roots of a tree, with larger tubes leading to smaller ones.

P

ULMONARY

This means that the disease is in your lungs.

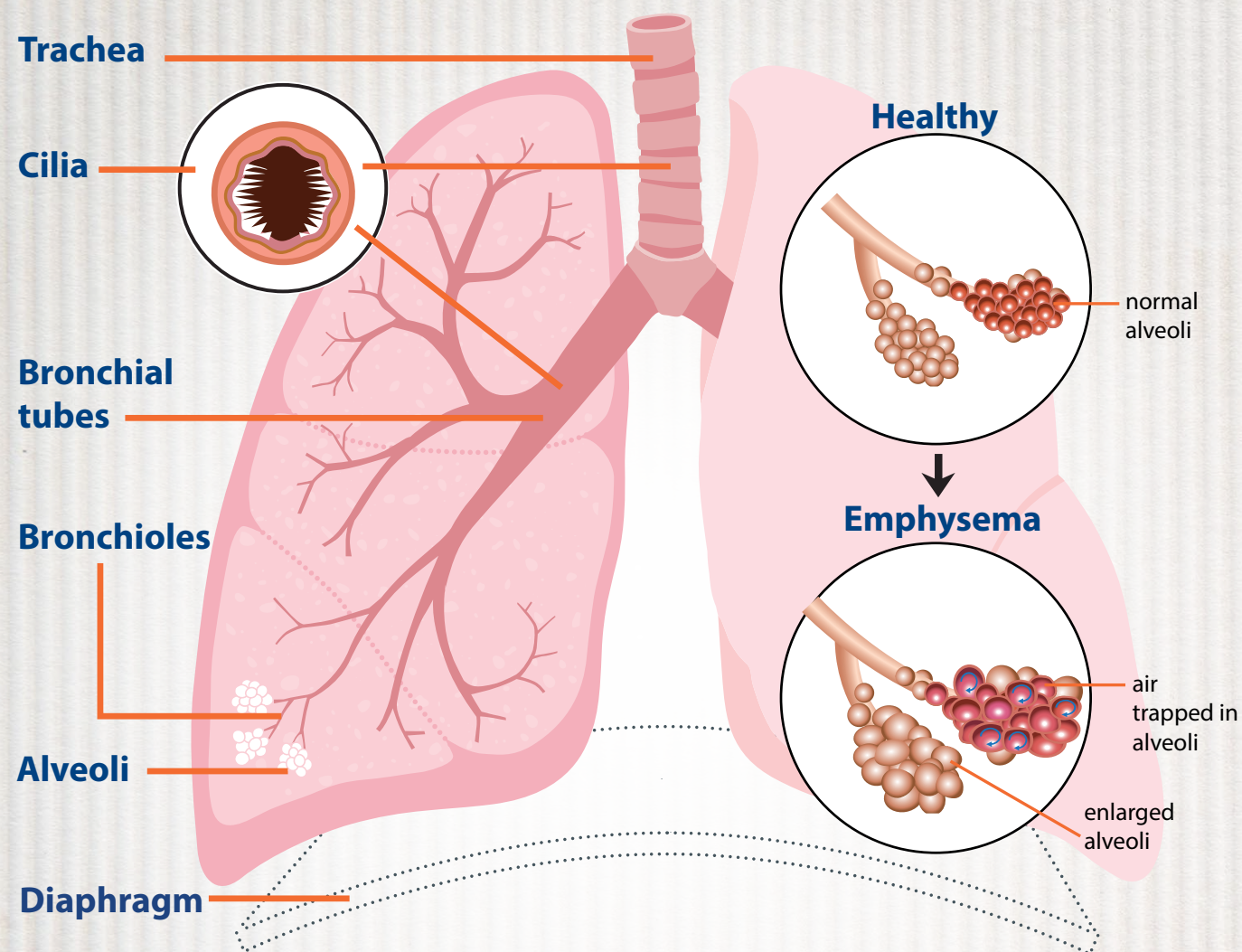
D

ISEASE

This means that your lungs have some damage. But with the right treatment, your symptoms can be managed and the progression of the disease can be slowed.



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Most people with COPD have a combination of:

Emphysema

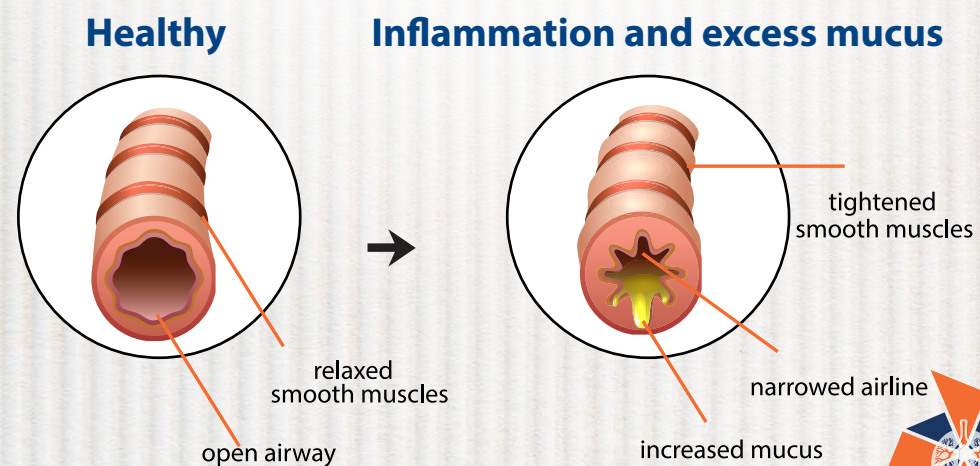
(where the air sacs in your lungs become damaged and do not move oxygen into the blood or carbon dioxide out as well).

And

Chronic bronchitis

(where the airways become narrow and produce too much mucus).

COPD is most often caused by breathing in smoke (including tobacco smoke) or fumes over a long time. It is not contagious, but some kinds of genetic COPD can be passed from parent to child.



Keys to Living Well with COPD

- Get help quitting smoking
- Take your medications as prescribed
- Stay as active as possible
- Learn to recognize symptom flare-ups (exacerbations)



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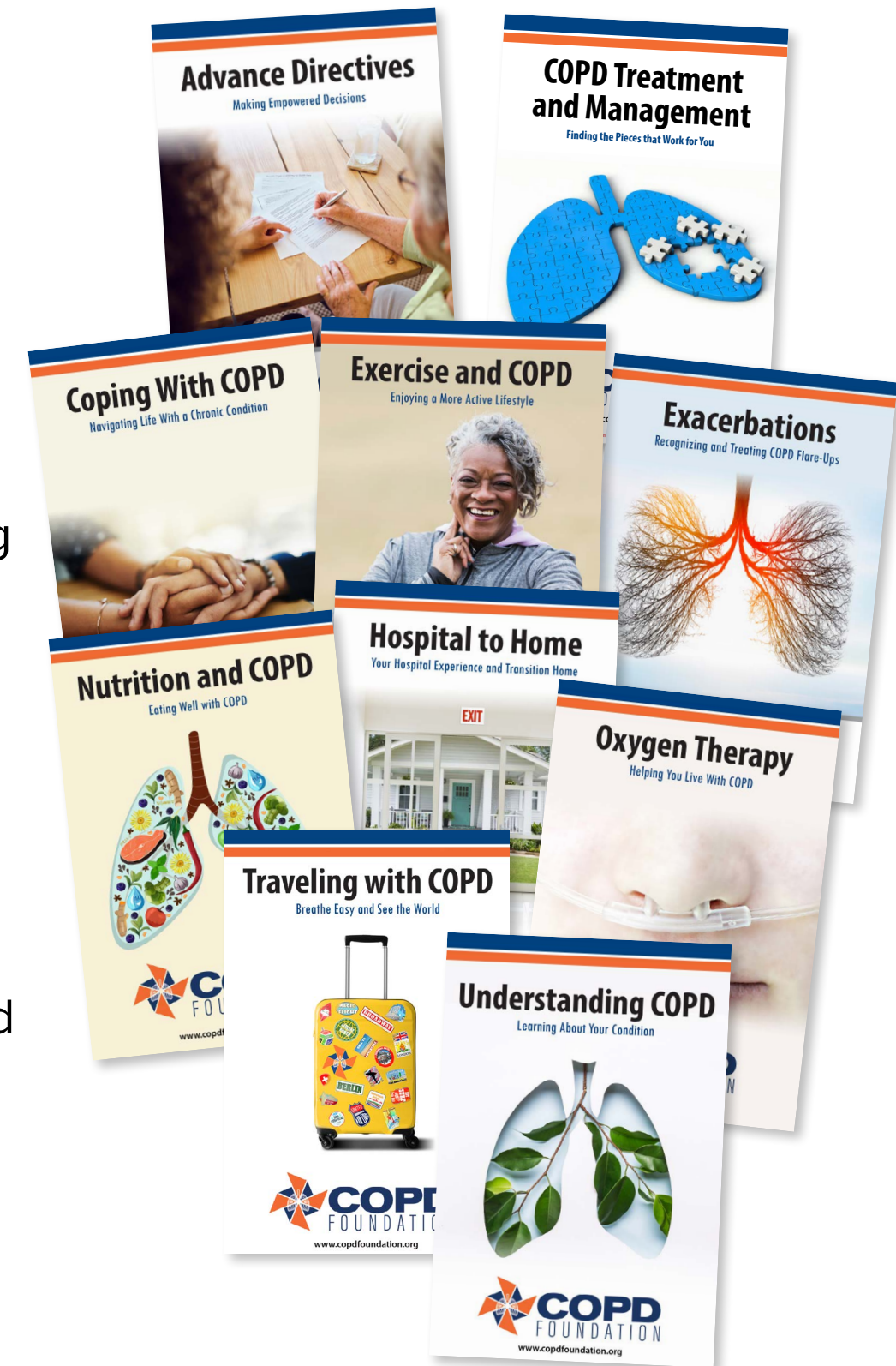
Additional Resources

The COPD Foundation invites you to check out our resources to help you learn more about COPD!

Guides for Better Living: Learn about different aspects about COPD, including how to cope with symptoms, therapies to improve your quality of life, and how to recognize flare-ups. <https://copdf.co/guides>

COPD360social: Connect with others on the COPD journey, share thoughts and ideas, and ask questions to both peers and clinical experts in our specialized online community. <https://copdf.co/COPD360social>

Download our COPD Pocket Consultant Guide app (free for both [Android](#) and [iOS](#)) to develop an individual COPD action plan, get prompts and reminders for your next office visit, and much more.



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