Objectives

- CONSIDER PREVALENCE AND BURDEN .
- REVIEW CURRENT GUIDELINES
- FUTURE CONSIDERATIONS FOR MANAGEMENT

Definition

Common, treatable, preventable disease

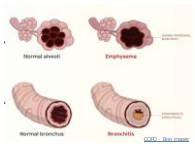
Characterized by **airflow limitations** and persistent respiratory distress

Causes by airway and/or alveolar abnormalities.

Classic Understanding of Impact

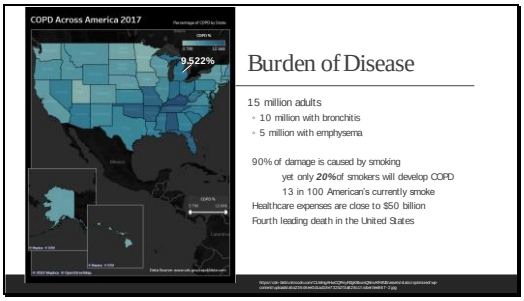
Bronchitis – impacting the bronchial tubes resulting in inflammation and extra mucus decreasing airflow.

Emphysema – impacting the air sacs resulting in inflammation and destruction with remodeling making it difficult for air exchange.



Concomitant Diseases:
- Cardiovascular disease
- Metabolic syndrome
- Depression
- Anxiety
- Osteoporosis

Symptoms:
- Breathlessness
- Wheezing
- Coughing
- Sputum or mucus production



Burden of Disease

15 million adults
- 10 million with bronchitis
- 5 million with emphysema

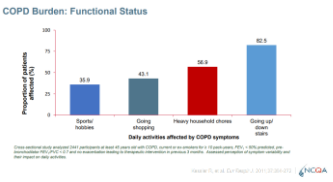
90% of damage is caused by smoking
yet only ***20%*** of smokers will develop COPD
13 in 100 American's currently smoke
Healthcare expenses are close to $50 billion
Fourth leading death in the United States

Economic Burden

Health Care Systems (direct cost)
- ~34 billion dollars
- Over 700,000 hospitalizations annually
- 6-14% of patients are predicted to pass 30 days after admission
- Overall readmission rate is up to 28%
  - hence we see metrics for appropriate treatment and effort for prevention due to lack of reimbursement.

Employers (indirect cost)
- 3.2 days of absenteeism annually
- ~4 billion dollars in productivity

Patient Burden

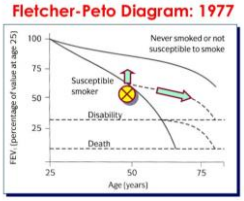


Disease or Syndrome

Study done in 1976 of a random sample of men 30-59 years of age were evaluated every six months over eight years to result in the ***Fletcher and Peto***

75 years ago

Fletcher-Peto Diagram: 1977



Disease verse Syndrome

Most Common is exposure noxious chemicals that irritates lung tissue over a period of time

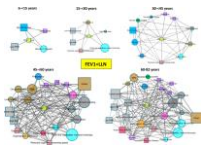
- Pollution
  - Indoor: smoke, aerosol, fumes, occupational dust
  - Outdoor: fossil fuels
- Smoking
  - Many patients have never smoked
- Genetics
  - Alcoga-1 antitrypsin efficiency
  - Low birth weight
  - Female gender

COPD 2020: changes and challenges

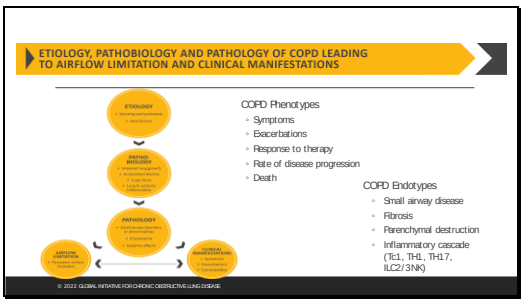
Disease Verses Syndrome

Observations of environmental risk factors

- Yellow center represents the persons ang the age
- Each node represents a variable and the size of the node is proportional to the prevalence of that variable
- The links between nodes and variables were found to have statistically significant relationships
- Thicker lines indicate odds rations >1



COPD 2020: changes and challenges | American Journal of Physiology-Lung Cellular and Molecular Physiology


ETIOLOGY, PATHOBIOLOGY AND PATHOLOGY OF COPD LEADING TO AIRFLOW LIMITATION AND CLINICAL MANIFESTATIONS
ETIOLOGY
PATHO-BIOLOGY
PATHOLOGY
COPD Phenotypes
Symptoms
Exacerbations
Response to therapy
Rate of disease progression
Death
COPD Endotypes
Small airway disease
Fibrosis
Parenchymal destruction
Inflammatory cascade (Tc1, TH1, TH17, ILC2/3NK)
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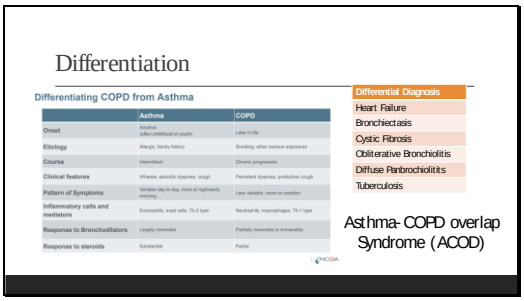
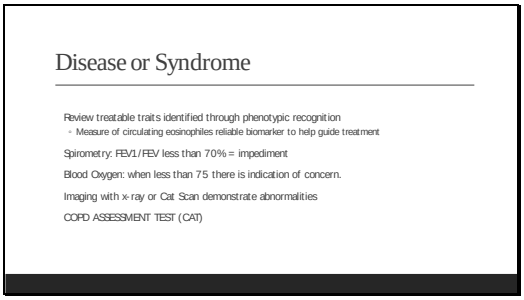

Differentiation
Differentiating COPD from Asthma
Asthma
COPD
Onset
Etiology
Course
Clinical features
Pattern of Symptoms
Inflammatory cells and mediators
Response to Bronchodilators
Response to steroids
Differential Diagnosis
Heart Failure
Bronchiectasis
Cystic Fibrosis
Obliterative Bronchiolitis
Diffuse Panbrochiolitits
Tuberculosis
Asthma-COPD overlap Syndrome (ACOD)


Disease or Syndrome
Review treatable traits identified through phenotypic recognition
Measure of circulating eosinophiles reliable biomarker to help guide treatment
Spirometry: FEV1/FEV less than 70% = impediment
Blood Oxygen: when less than 75 there is indication of concern.
Imaging with x-ray or Cat Scan demonstrate abnormalities
COPD ASSESSMENT TEST (CAT)

GOAL

Goal is to reduce symptoms and risk

1. Relieve dyspnea
2. Improve exercise tolerance
3. Improve health status

1. Reduce outpatient exacerbations
2. Decrease hospitalizations

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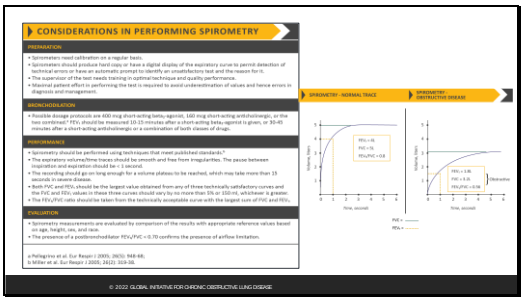

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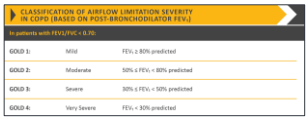
Diagnosis



Diagnosis is ***not*** enough

- 1 in 3 patients do not receive appropriate
  - Spirometry
  - Pharmacological treatment
  - Or oxygen when needed
- 63% of patient receive smoking cessation
- 19% are referred to pulmonary rehabilitation

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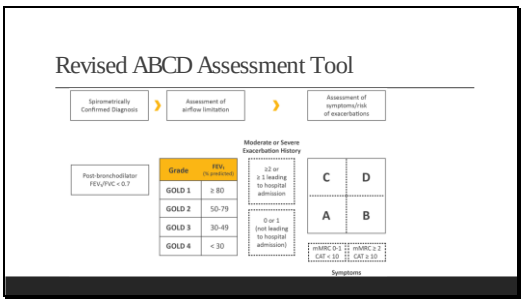
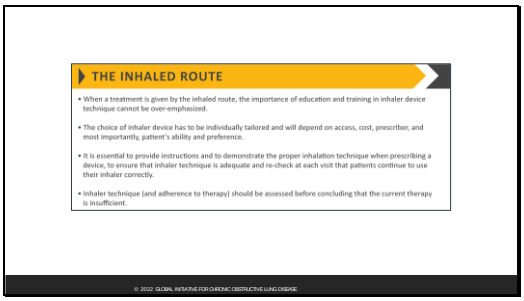

Revised ABCD Assessment Tool
Spirometrically Confirmed Diagnosis
Assessment of airflow limitation
Assessment of symptoms/risk of exacerbations
Post-bronchodilator FEV1/FVC < 0.7
Grade
FEV1 (% predicted)
GOLD 1
≥ 80
GOLD 2
50-79
GOLD 3
30-49
GOLD 4
< 30
Moderate or Severe Exacerbation History
≥2 or ≥ 1 leading to hospital admission
0 or 1 (not leading to hospital admission)
C
D
A
B
mMRC 0-1
CAT < 10
mMRC ≥ 2
CAT ≥ 10
Symptoms


THE INHALED ROUTE
• 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.
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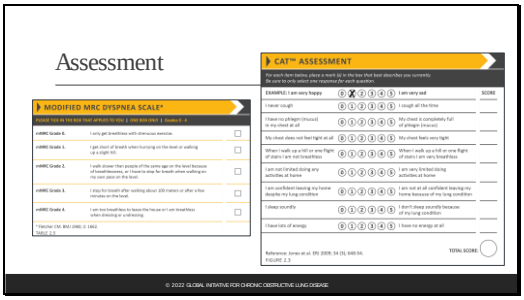
Assessment
MODIFIED MRC DYSPNEA SCALE*
CAT™ ASSESSMENT
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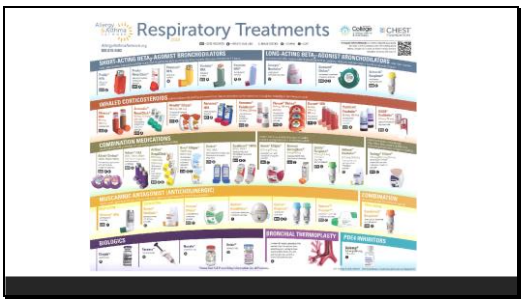
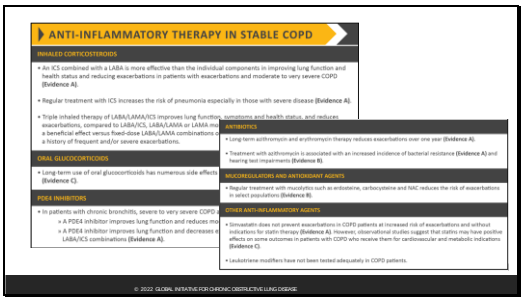

Respiratory Treatments
SHORT-ACTING BETA2-AGONIST BRONCHODILATORS
LONG-ACTING BETA2-AGONIST BRONCHODILATORS
INHALED CORTICOSTEROIDS
COMBINATION MEDICATIONS
MUSCARINIC ANTAGONIST (ANTICHOLINERGIC)
COMBINATION
BIOLOGICS
BRONCHIAL THERMOPLASTY
PDE4 INHIBITORS


ANTI-INFLAMMATORY THERAPY IN STABLE COPD
INHALED CORTICOSTEROIDS
• An ICS combined with a LABA is more effective than the individual components in improving lung function and health status and reducing exacerbations in patients with exacerbations and moderate to very severe COPD (Evidence A).
• Regular treatment with ICS increases the risk of pneumonia especially in those with severe disease (Evidence A).
• Triple inhaled therapy of LABA/LAMA/ICS improves lung function, symptoms and health status, and reduces exacerbations, compared to LABA/ICS, LABA/LAMA or LAMA/ICS (Evidence A). There is a beneficial effect versus fixed-dose LABA/LAMA combinations in patients with a history of frequent and/or severe exacerbations.
ORAL GLUCOCORTICOIDS
• Long-term use of oral glucocorticoids has numerous side effects (Evidence C).
PDE4 INHIBITORS
• In patients with chronic bronchitis, severe to very severe COPD
» A PDE4 inhibitor improves lung function and reduces me
» A PDE4 inhibitor improves lung function and decreases e
LABA/ICS combinations (Evidence A).
ANTIBIOTICS
• Long-term azithromycin and erythromycin therapy reduces exacerbations over one year (Evidence A).
• Treatment with azithromycin is associated with an increased incidence of bacterial resistance (Evidence A) and hearing test impairments (Evidence B).
MUCOREGULATORS AND ANTIOXIDANT AGENTS
• Regular treatment with mucolytics such as erdosteine, carbocysteine and NAC reduces the risk of exacerbations in select populations (Evidence B).
OTHER ANTI-INFLAMMATORY AGENTS
• Simvastatin does not prevent exacerbations in COPD patients at increased risk of exacerbations and without indications for statin therapy (Evidence A). However, observational studies suggest that statins may have positive effects on some outcomes in patients with COPD who receive them for cardiovascular and metabolic indications (Evidence C).
• Leukotriene modifiers have not been tested adequately in COPD patients.
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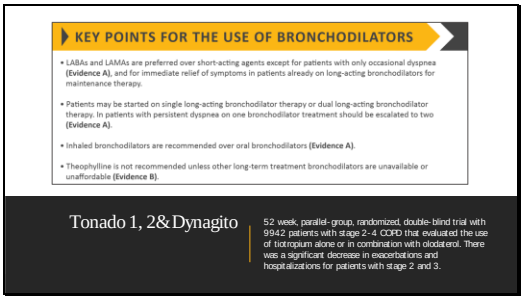
KEY POINTS FOR THE USE OF BRONCHODILATORS
• LABAs and LAMAs are preferred over short-acting agents except for patients with only occasional dyspnea (Evidence A), and for immediate relief of symptoms in patients already on long-acting bronchodilators for maintenance therapy.
• Patients may be started on single long-acting bronchodilator therapy or dual long-acting bronchodilator therapy. In patients with persistent dyspnea on one bronchodilator treatment should be escalated to two (Evidence A).
• Inhaled bronchodilators are recommended over oral bronchodilators (Evidence A).
• Theophylline is not recommended unless other long-term treatment bronchodilators are unavailable or unaffordable (Evidence B).
Tonado 1, 2& Dynagito
52 week, parallel-group, randomized, double-blind trial with 9942 patients with stage 2-4 COPD that evaluated the use of tiotropium alone or in combination with olodaterol. There was a significant decrease in exacerbations and hospitalizations for patients with stage 2 and 3.

Medicare Part B

REVERENACIN 175MCG

LAMA: once daily solution
Only available from durable medication

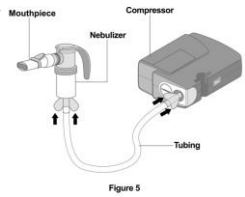

Figure 5

Use of ICS

- Eosinophils
  - Blood and sputum do not corelate equally
- History of infection

FACTORS TO CONSIDER WHEN INITIATING ICS TREATMENT

Factors to consider when initiating ICS treatment in combination with one or two long-acting bronchodilators (note the scenario is different when considering ICS withdrawal):

· STRONG SUPPORT ·	· CONSIDER USE ·	· AGAINST 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	• 1 moderate exacerbation of COPD per year# • Blood eosinophils ≥ 100 to < 300 cells/µL	• Repeated pneumonia events • Blood eosinophils <100 cells/µL • History of mycobacterial infection

Réexpte 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.

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Follow Up

- Continue to evaluate inhaler use: Consider an alternative device
- Deescalate use of ICS

Inhaled route of delivery

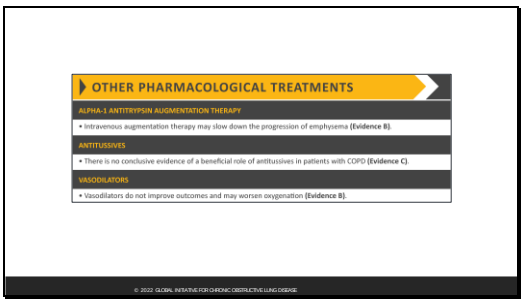
A Blessing and a Curse

	Total*
Devices n	3393
No error	25.3 (23.6–26.7)
Device-independent errors	53.8 (52.2–55.5)
Device-dependent errors	43.1 (41.5–44.8)
At least one critical error	30.0 (28.5–31.6)

Errors

- Device care and preparation
- Exhalation before use
- Timing
- Coordination with device
- Flow rate errors
- Completing inhalation/breath hold
- After care (ie, rinsing/gargling)

Molinard et al. ERJ 2017; 49:1601754 | D'Urso et al. Pul Ther 2019; 5: 25-41 | NCQA


OTHER PHARMACOLOGICAL TREATMENTS
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 patients with COPD (Evidence C).
VASODILATORS
• Vasodilators do not improve outcomes and may worsen oxygenation (Evidence B).
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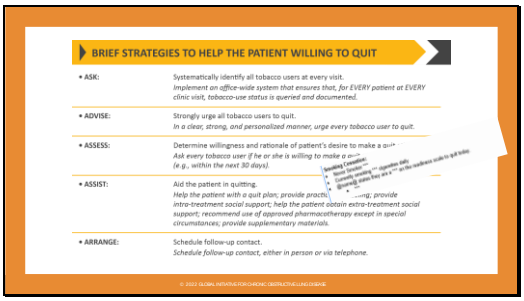
BRIEF STRATEGIES TO HELP THE PATIENT WILLING TO QUIT
• ASK: Systematically identify all tobacco users at every visit.
Implement an office-wide system that ensures that, for EVERY patient at EVERY clinic visit, tobacco-use status is queried and documented.
• ADVISE: Strongly urge all tobacco users to quit.
In a clear, strong, and personalized manner, urge every tobacco user to quit.
• ASSESS: Determine willingness and rationale of patient's desire to make a
Ask every tobacco user if he or she is willing to make a
(e.g., within the next 30 days).
• ASSIST: Aid the patient in quitting.
Help the patient with a quit plan; provide
intra-treatment social support; help the patient obtain extra-treatment social support; recommend use of approved pharmacotherapy except in special circumstances; provide supplementary materials.
• ARRANGE: Schedule follow-up contact.
Schedule follow-up contact, either in person or via telephone.
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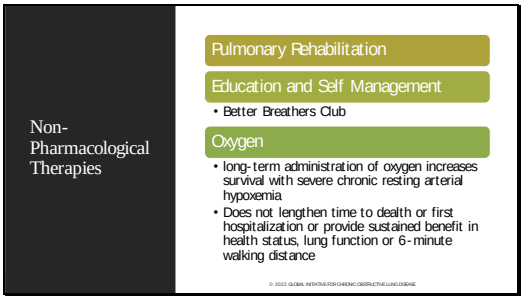
Non-Pharmacological Therapies
Pulmonary Rehabilitation
Education and Self Management
• Better Breathers Club
Oxygen
• long-term administration of oxygen increases survival with severe chronic resting arterial hypoxemia
• Does not lengthen time to death or first hospitalization or provide sustained benefit in health status, lung function or 6-minute walking distance
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Non-Pharmacological Therapies

Lung Volume Reduction Surgery
- Improves survival in severe with upper-lobe emphysema and low post0rehabilitation exercise capacity

Bullectomy
- Associated with decreased dyspnea, improved lung function and exercise tolerance

Transplantation

Bronchoscopic Interventions
- Endobronchial valves
- Lung coils
- Vapor ablation

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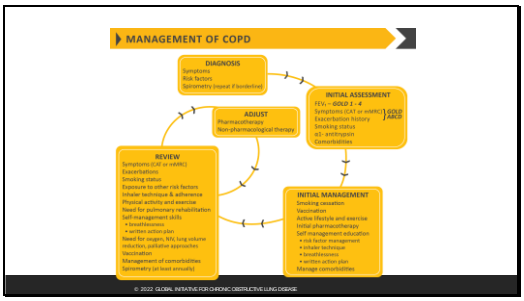

References

1. Global Initiative for Chronic Obstructive Lung Disease (Gold) 2022. Global Initiative for Chronic Obstructive Lung Disease - Global Initiative for Chronic Obstructive Lung Disease - GOLD (goldcopd.org)
2. Molimard M, Raherison C, Lignot S et al. Chronic obstructive pulmonary disease exacerbation and inhaler device handling: real-life assessment of 2935 patients. Eur Respir J 2017;49
3. D'Urzo A, Chapman KR, Donohue JF, Kardos P, Maleki-Yazdi MR, Price D. Inhaler devices for Delivery of LABA/LAMA Fixed-Dose Combinations in patients with COPD. Pulm Ther 2019;5:23-41
4. Chapman KR, Hurst JR, Ren SM, et al. Long-Term Triple Therapy De-escalation to Indacaterol/Glycopyrronium in Patients with Chronic Obstructive Pulmonary Disease (SUNSET): A Randomized, Double-Blind, Triple -Dummy Clinical Trial. Am J Respir Crit Care Med 2018;198:329-39
5. Breyer-Kohansal R, Hartl S, Burghuber OC, Urban M, Schrott A, Agusti A, Sigsgaard T, Vogelmeier C, Wouters E, Studnicka M, Breyer MK. The LEAD (Lung, Heart, Social, Body) Study: Objectives, Methodology, and External Validity of the Population-Based Cohort Study. *J Epidemiol* 29: 315–324, 2019. doi:10.2188/jea.JE20180039. Crossref | PubMed | ISI | Google Scholar
6. Lt Col John F Freiler. The Astham-COPD Overlap Syndrome. Fed Pract. 2015 Sep; 32(suppl 10): 19S-23S.