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Provider Education Program

COPD: Acute Exacerbations and End of Life

Presented by: Dr. Alan Kaplan

Presenter Disclosure

Presenter's name: Alan Kaplan MD CCFP(EM) FCFP
Chairperson, Family Physician Airways Group of Canada
Professor of Respiratory Medicine, OPRI

Relationships with commercial interests:

- Grants/Research Support: Novartis
- Speaker Bureau/Honoraria: AZ, BI, Covis, Merck, Novartis, Teva, Trudel, Pfizer
- Consulting Fees: AZ, BI, GSK, Teva, Trudel
- Other: Co-chair Health Quality Ontario Community COPD Mgmt,
- Medical director, LHIN Pulmonary Rehabilitation
- Chairperson, Family Physician Airways Group of Canada
- Member, Health Canada Section of Allergy/Respiratory therapeutics
- Vice President Respiratory Effectiveness Group

Disclosure of Financial support

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This program has received no in-kind support

Potential for Conflict(s) of Interest:

Interest in family practice, respiratory medicine and chronic pain management

Work with multiple companies that make meds for COPD

Mitigating Potential Bias

The content used for this program is developed though incorporation of the following references sources:

- CTS COPD Position Statement: Pharmacotherapy in patients with COPD - An Update, 2017
- CTS COPD Position Statement: Pharmacotherapy in patients with COPD, CTS Educational Slide Deck 2018
- Global Strategy for Diagnosis, Management, and Prevention of COPD (GOLD) Report 2018
- Canadian Thoracic Society (CTS) Recommendations for management of COPD in primary care – 2008 Update
- CTS Managing Dyspnea in patients with advanced COPD – A CTS clinical practice guideline 2011

Learning Objectives

- By the end of this session the participant will be able to:
- Apply latest CTS COPD position statement and global clinical practice guidelines to COPD assessment and management
- Recognize an acute exacerbation of COPD (AECOPD) and its impact on patients with advanced COPD
- Apply pharmacological and non-pharmacological prevention strategies for AECOPD
- Review the components of advance care planning, such as dyspnea management and palliative care
- Apply key management principles to a COPD case-based scenario

Case Study: Grace

- Grace is a 75-year-old retired teacher
- She is a widow who lives alone, her daughter lives in England
- 3 years ago she was hospitalized with an AECOPD
- Spirometry at that time confirmed a diagnosis COPD
- Since then she had 5 AEs and was hospitalized on one occasion with pneumonia and acute respiratory failure requiring BiPAP
- She now presents with increasing dyspnea over the last 3 months following her last exacerbation. It is becoming more difficult for her to walk her dog.
- She quit smoking 13 years ago after a 34-pack-year history

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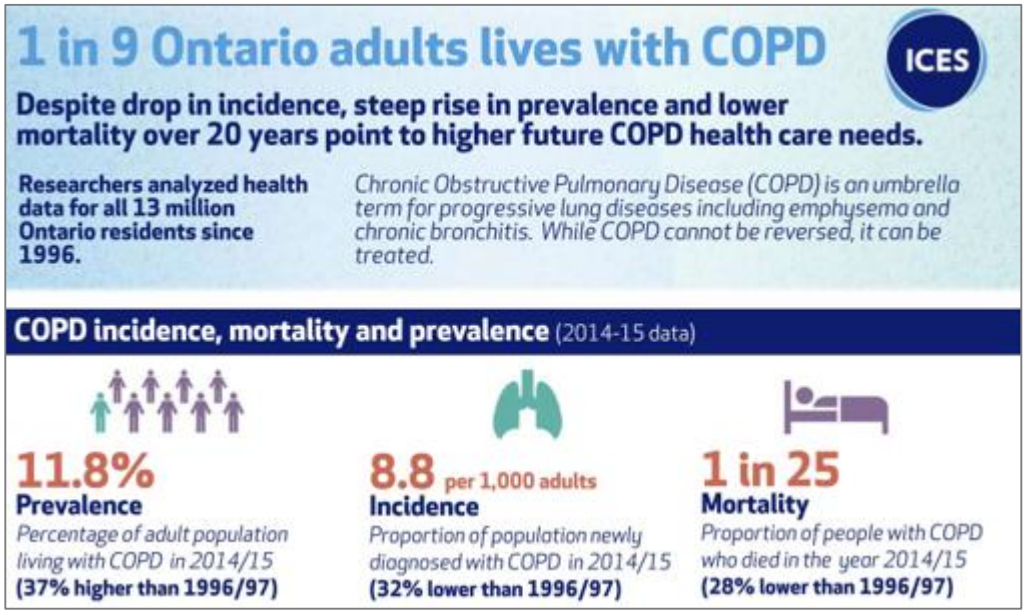
COPD Burden in Ontario



- Direct health care system costs: $10 billion by 2024, $2.3 billion > 2014[1]
- In Ontario, people with COPD aged 35 and older are responsible for:[2]
  - 24% of all hospitalizations
  - 25% of all emergency department visits
  - 30% of all homecare services
  - 35% of all long-term care residence spots

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1.ICES Gershon AS et al. Oct 2017 COPD in Ontario . 2.Gershon A, Guan J 2013

Clinical Assessment of COPD

- **Assess lung function:** Spirometry or PFT
- **Assess risk factors**: Smoking (pack years), occupational and environmental exposures, family history, early life respiratory illness
- Assess for **co-morbidities** associated with COPD
- Assess **symptom burden** and **quality of life**:
  - ✓ MRC dyspnea scale (CTS)
  - ✓ COPD assessment test (CAT)
- Frequency & severity of **acute exacerbations**
- Disease **severity and risk of death** (BODE or ADO index)
- Effectiveness of **current medical therapy**

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CAT
COPD Assessment Test

Tools to assess COPD symptoms

mMRC dyspnea scale[1,2]		
Please tick in the box that applies to you (1 box only)		
Grade 0	I only get breathless with strenuous exercise	☐
Grade 1	I get short of breath when hurrying on the level or walking up a slight hill	☐
Grade 2	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	☐
Grade 3	I stop for breath after walking about 100 meters or after a few minutes on the level	☐
Grade 4	I am too breathless to leave the house or I am breathless when dressing or undressing	☐
	mMRC grade (range: 0–4)	

COPD, chronic obstructive pulmonary disease; mMRC, modified Medical Research Council

1. Fletcher CM. *Br Med J*. 1960;2:1662; 2. Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (2019 Report). Available at: www.goldcopd.org. Accessed January 15, 2019

Tools to assess COPD symptoms (cont.)

CAT™ [1]			
For each item below, place a mark (X) over the circle that describes you currently – be sure to only select one response for each question			
Example: I am very happy	⓿ ❶ ❷ ❸ ❹ ❺	I am very sad	Score
I never cough	⓿ ❶ ❷ ❸ ❹ ❺	I cough all the time	☐
I have no phlegm (mucus) in my chest at all	⓿ ❶ ❷ ❸ ❹ ❺	My chest is completely full of phlegm (mucus)	☐
My chest does not feel tight at all	⓿ ❶ ❷ ❸ ❹ ❺	My chest feels very tight	☐
When I walk up a hill or one flight of stairs, I am not breathless	⓿ ❶ ❷ ❸ ❹ ❺	When I walk up a hill or one flight of stairs, I am very breathless	☐
I am not limited doing any activities at home	⓿ ❶ ❷ ❸ ❹ ❺	I am very limited doing activities at home	☐
I am confident leaving my home despite my lung condition	⓿ ❶ ❷ ❸ ❹ ❺	I am not at all confident leaving my home because of my lung condition	☐
I sleep soundly	⓿ ❶ ❷ ❸ ❹ ❺	I don't sleep soundly because of my lung condition	☐
I have lots of energy	⓿ ❶ ❷ ❸ ❹ ❺	I have no energy at all	☐
		Total score (range: 0–40)	☐

CAT, COPD Assessment Test; COPD, chronic obstructive pulmonary disease

1. Jones PW, et al. *Eur Respir J*. 2009;34:648-654

Case Study: Clinical Assessment

Comorbidities:

She has hypertension and sustained a myocardial infarction 6 years ago. She is currently taking enalapril 5 mg daily, ASA 81mg daily, and atorvastatin 10 mg daily.

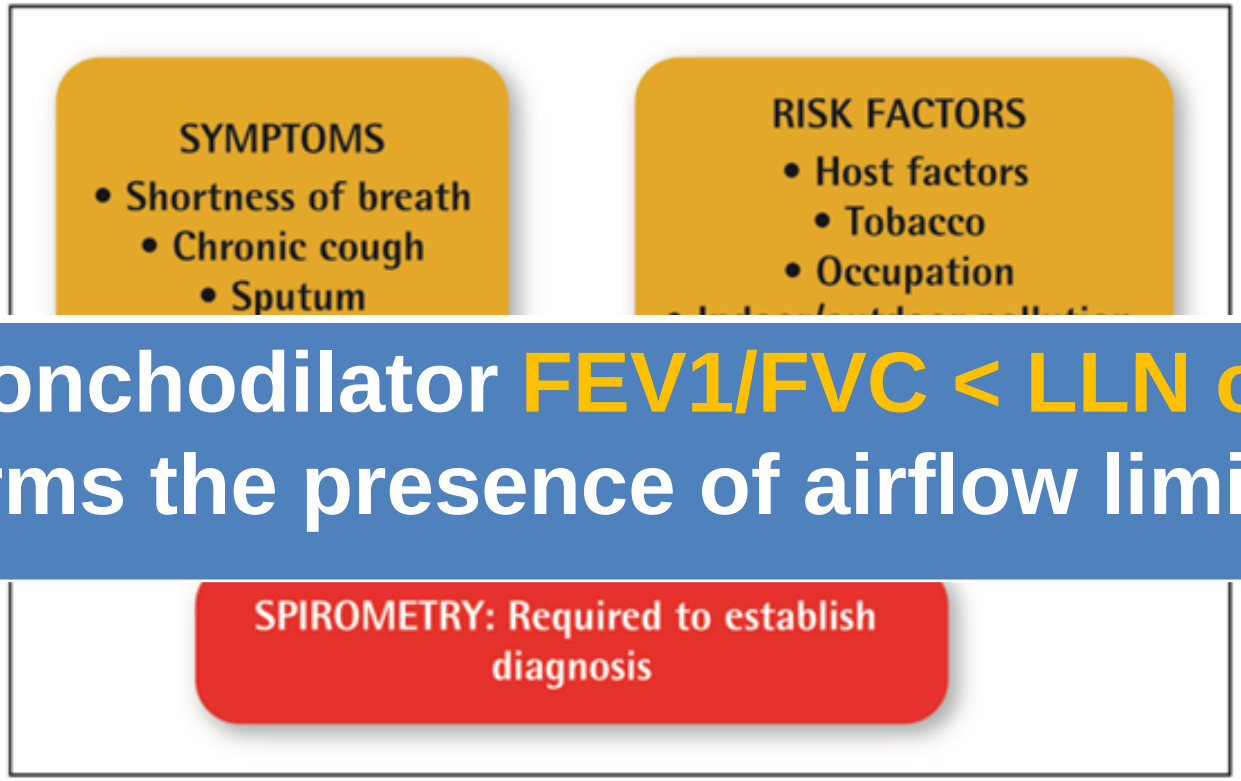
Physical examination:

There were decreased breath sounds bilaterally. She had a soft pansystolic murmur consistent with mitral valve regurgitation. There was slight pitting edema of the ankles.

Chest x-ray: showed signs of hyperinflation but no other abnormalities.

Spirometry: The FEV1 was 45% predicted with an FEV1/VC ratio after bronchodilator of 0.55 (<LLN)

COPD Diagnosis: Key Points



Post-bronchodilator FEV1/FVC < LLN or < 0.70 confirms the presence of airflow limitation

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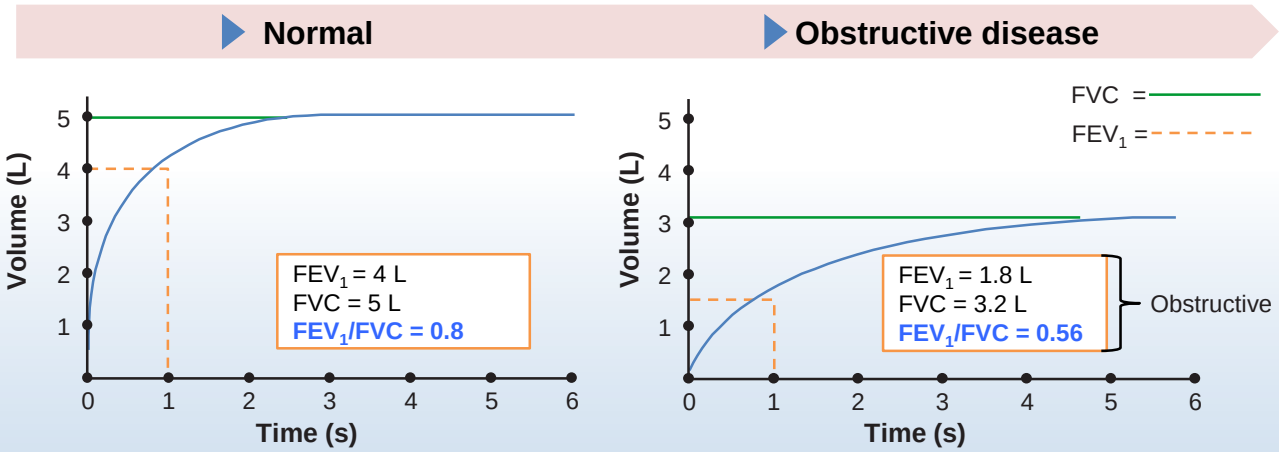
Adapted from CRJ 2008: 15 (Suppl A): 1A-8A; GOLD 2017

Criterion for COPD diagnosis

Spirometry

Spirometrically confirmed diagnosis

Post-bronchodilator $FEV_1/FVC < 0.7$



Spirometry is not recommended for routine, general population, or practice-based screening in asymptomatic patients[1]

COPD, chronic obstructive pulmonary disease; FEV_1, forced expiratory volume in 1 second; FVC, forced vital capacity

Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (2019 Report). Available at: http://goldcopd.org. Accessed January 15, 2019

Assess COPD Comorbidities

- Cardiovascular diseases:
  - Heart Failure
  - Ischemic Heart Disease
  - Arrhythmia
  - Hypertension
  - Peripheral Vascular Disease

- Lung cancer
- Bronchiectasis
- Cachexia
- Peripheral Muscle Dysfunction
- Anemia
- Anxiety and depression
- Obstructive Sleep Apnea

- Metabolic syndrome
- Diabetes
- Osteoporosis
- GERD
- Infections
- Glaucoma
- Cataracts

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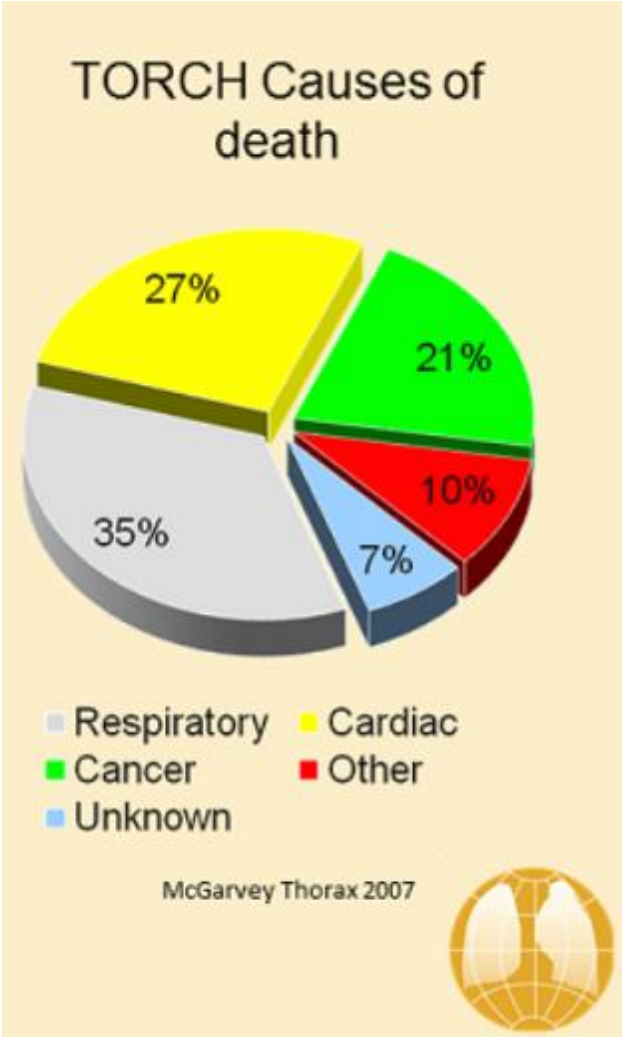
Can Respir J 2008; 15 (Suppl A): 1A-8A

COPD comorbidities and mortality

- More people with COPD die from cardiovascular disease, cancer and other co-morbidities than from respiratory causes
- If we are going to make a difference in reducing mortality in COPD, we have to address the co-morbidities



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A must read article!

Prim Care Respir J 2013; **22**(4): 468-476

Primary Care RESPIRATORY JOURNAL
www.thepcrj.org

CASE-BASED LEARNING

A woman with breathlessness: a practical approach to diagnosis and management

***Alan Kaplan[1], Kevin Gruffydd-Jones[2], Frederik van Gemert[3], Bruce J Kirenga[4], Andrew RL Medford[5]**

[1] Family Physician Airways Group of Canada, Richmond Hill, Ontario, Canada
[2] General Practitioner, Box Surgery, Box , Wiltshire, UK
[3] Department of General Practice, University of Groningen, University Medical Center Groningen, Groningen, The Netherlands
[4] Department of Medicine, School of Medicine, Makerere University, Kampala, Uganda
[5] Consultant & Honorary Senior Lecturer in Thoracic Medicine & Interventional Pulmonology, North Bristol Lung Centre & University of Bristol, Southmead Hospital, Bristol, UK

Commissioned article; externally peer-reviewed; received 30th September 2013; accepted 26th October 2013; online 23rd November 2013

Abstract

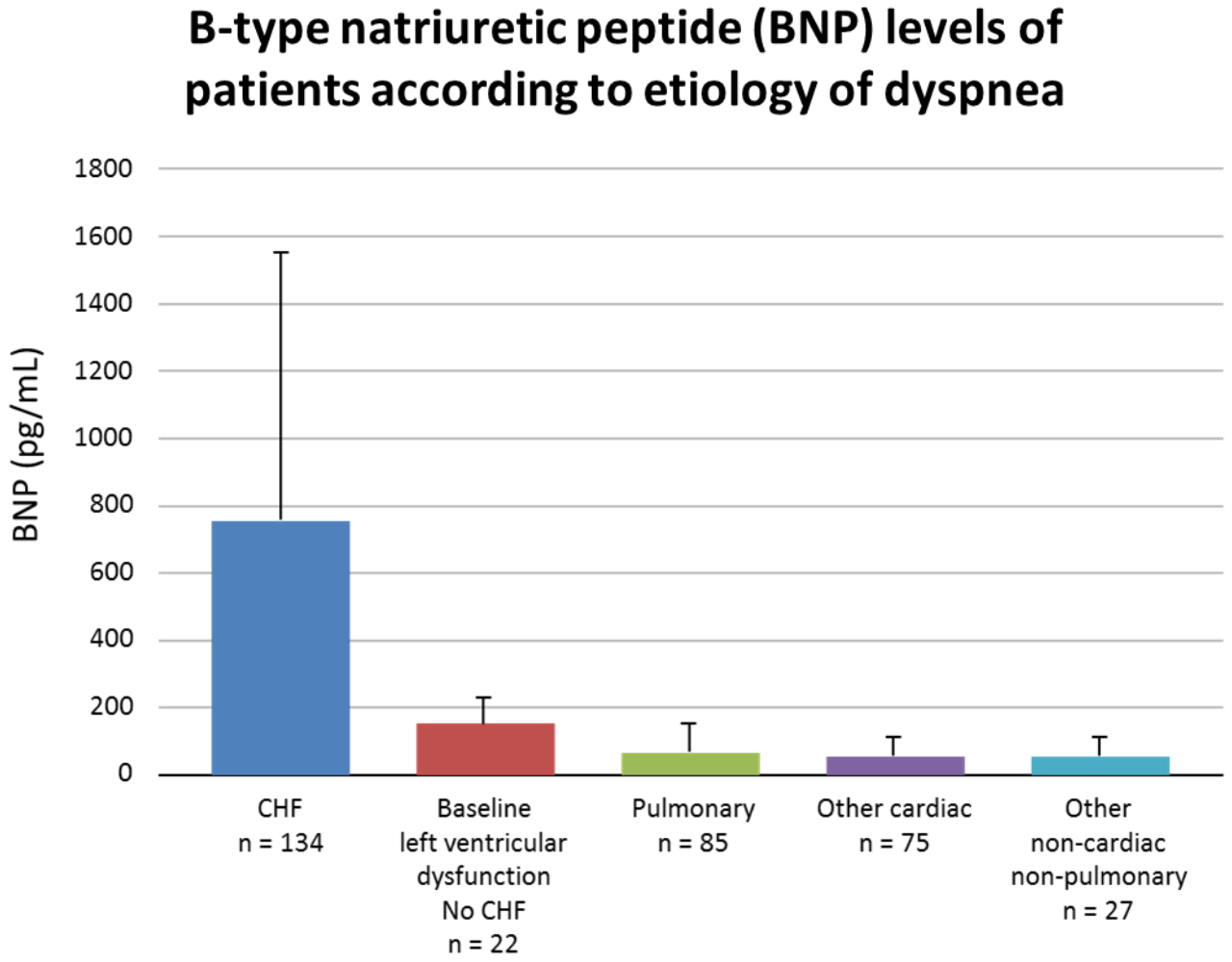
Worsening breathless in a patient with severe chronic obstructive pulmonary disease (COPD) is a common diagnostic and management challenge in primary care. A systematic approach to history-taking and examination combined with targeted investigation of pulmonary, cardiovascular, thromboembolic and systemic causes is essential if co-morbidities are to be identified and managed. Distinguishing between heart failure and COPD is a particular challenge as symptoms and signs overlap. In low and middle income countries additional priorities are the detection of infections such as tuberculosis and human immunodeficiency virus (HIV). Clinicians need to be alert to the possibility of atypical presentations (such as pain-free variants of angina) and less common conditions (including chronic thromboembolic pulmonary hypertension) in order not to overlook important potentially treatable conditions.

A Kaplan *et al. Prim Care Respir J* 2013; **22**(4): 468-476
http://dx.doi.org/10.4104/pcrj.2013.00100

Table 1. Investigation of COPD and CHF

Investigation	Result in COPD	Result in CHF	Notes about the overlap
CXR	Hyperinflation. Vascular remodelling	Cardiomegaly, Vascular redistribution, Alveolar shadowing	Pulmonary vascular remodelling in those with COPD can mimic (upper lobe venous diversion[77]) or mask pulmonary oedema (asymmetric, regional, and reticular patterns),[10,78] Chest hyperinflation will falsely reduce the cardiothoracic ratio
Electrocardiography (ECG)	Cor pulmonale results in a range of ECG abnormalities including right bundle branch block and right ventricular hypertrophy	Check for rhythm disturbances and signs of ischaemic heart disease	The presence of ECG signs of cor pulmonale are indicative of a poor prognosis
Echocardiography	Assess cardiac function	Systolic vs diastolic function, Valvular issues	Acoustic windows may be impeded by air trapping in pulmonary disease, affecting quality of images as often as 10% in stable primary care patients with COPD(viii), 35% in severe disease,[79] and 50% in very severe airflow obstruction.[80]
B-type natriuretic peptide (BNP)	In stable disease, should be <100, but BNP levels can be increased in patients with COPD (and many other conditions)[81]	BNP is secreted by the left ventricle (LV) in response to volume elevated LV pressure; will differentiate cardiac from pulmonary cause of dyspnea,[82] especially for excluding CHF in subjects with acute dyspnoea.[83]	Normal levels exclude CHF, but raised levels can have many causes. Cor pulmonale is associated with an intermediate elevation of BNP,[84] typically ranging from 100 to 500 pg/mL. Levels <100 and >500 pg/mL have high negative and positive predictive values, respectively, for HF. See Figure 1
Spirometry	Obstruction. Diagnostic is post BD ratio of FEV_1/FVC <70%	Interstitial and alveolar oedema cause compression and obstruction of the airways in patients with decompensated CHF,[85,86] contrasting with restrictive defects when CHF is stable	Potential misdiagnosis and overestimation of COPD severity. With diuresis, mean FEV_1 improves by up to 35% and often returns to normal;[85]

Utility of BNP in Differentiating HF from Lung Disease in Patients Presenting with Dyspnea



Adapted from Morrison LK, et al. J Am Coll Cardiol 2002;39:202-9.

Assessing Disability in COPD – MRC Dyspnea Scale

		COPD Stage
Grade 1 →	Breathless with strenuous exercise	
Grade 2 →	Short of breath when hurrying on the level or walking up a slight hill	Mild
Grade 3 →	Walks slower than people of the same age on the level or stops for breath while walking at own pace on the level	Moderate
Grade 4 →	Stops for breath after walking 100 yards	
Grade 5→	Too breathless to leave the house or breathless when dressing	Severe

How would you classify Grace's COPD Severity by Symptoms and Disability?

Grace has to stop every block when walking her dog Rusty. Her social activities have decreased because she is often too tired and too short of breath. She is considering applying for home care services to help her with cleaning the apartment as she is getting too short of breath to do it herself.

Determine her MRC Grade using MRC dyspnea scale?

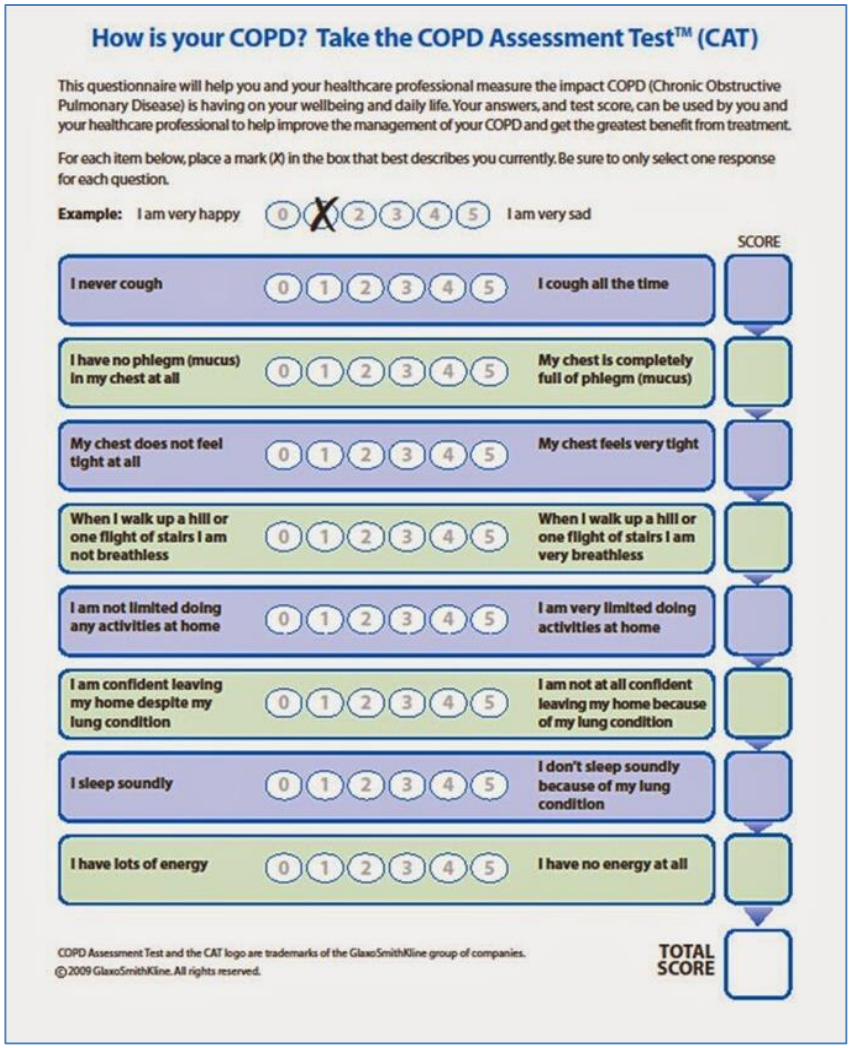
A. MRC grade 2

B. MRC grade 3

C. MRC grade 4

D. MRC grade 5

COPD Assessment Test



How is your COPD? Take the COPD Assessment Test™ (CAT)

This questionnaire will help you and your healthcare professional measure the impact COPD (Chronic Obstructive Pulmonary Disease) is having on your wellbeing and daily life. Your answers, and test score, can be used by you and your healthcare professional to help improve the management of your COPD and get the greatest benefit from treatment.

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	
	TOTAL SCORE

- CAT is validated, short (8- item)
- Simple, reliable and responsive
- Measures health status impairment in COPD
- Available worldwide, in many languages
- The score ranges from 0 to 40 (higher score = more impact)
- Available worldwide, in many languages

www.catestonline.org

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1. De Sousa et al . CanCOLD Eur Respir J. 2017 Sep 12;50(3).

What will you consider to assess her risk for future AECOPD?

A. Symptoms (MRC/CAT)

B. Exacerbation history

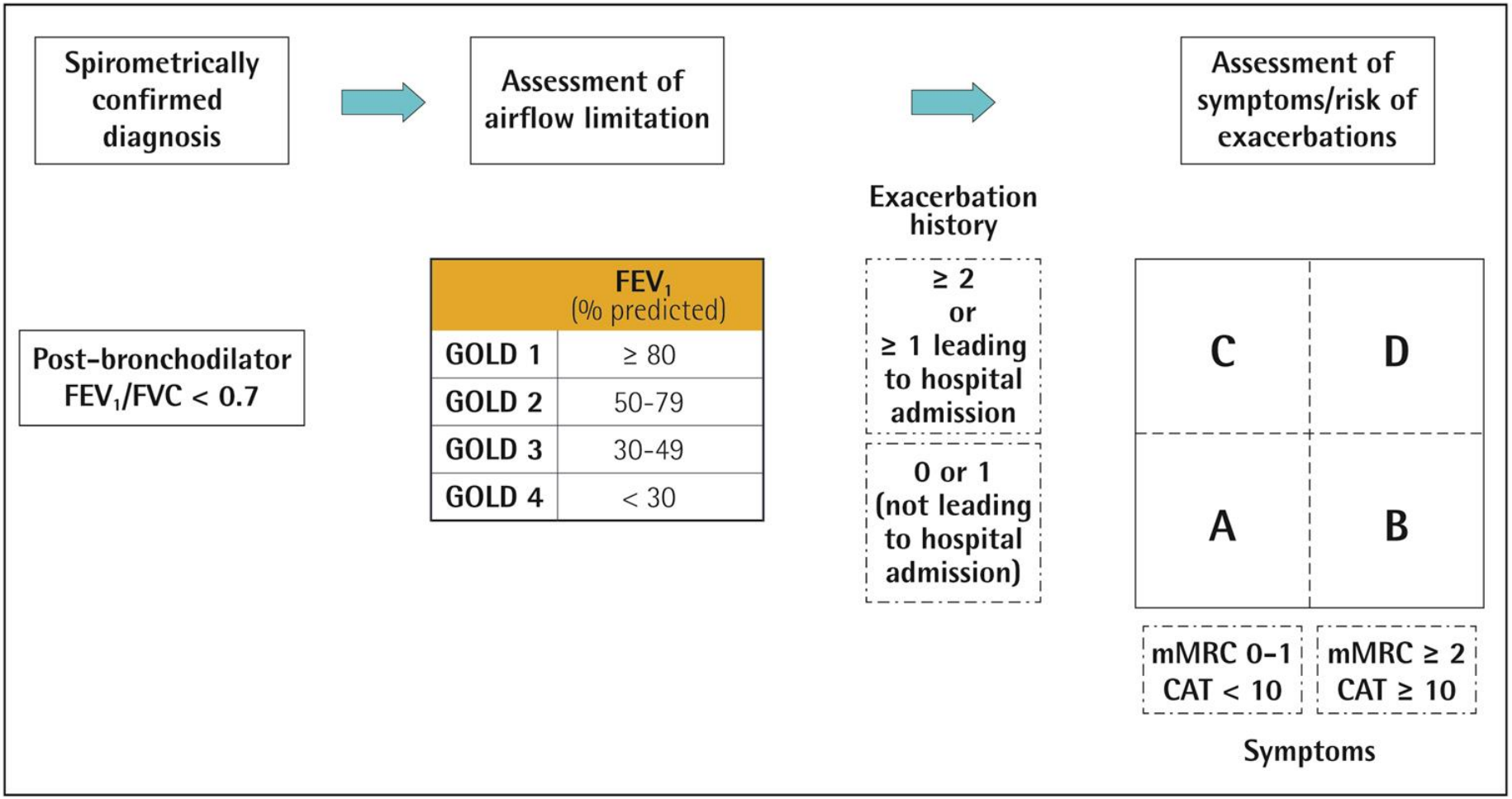
C. Lung Function (FEV1)

✓ D. A and B

E. All of the above

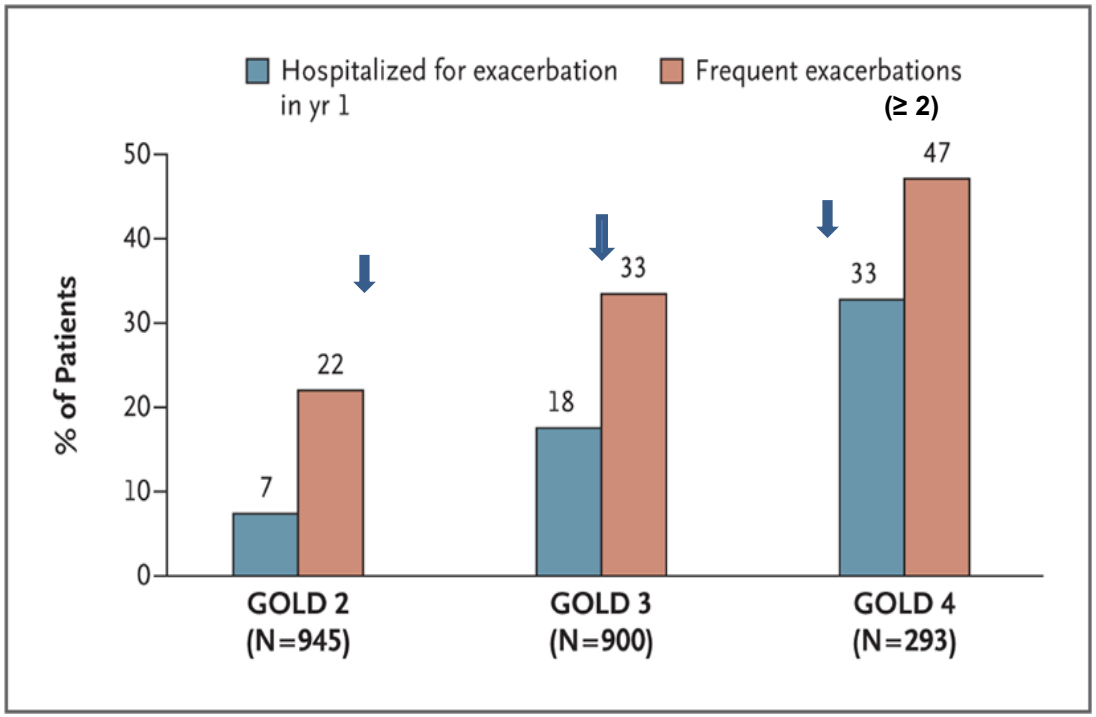
Is Grace at Risk for an Acute Exacerbation?

“Refined” GOLD ABCD Assessment Tool



ECLIPSE: Lung function & frequency of AE

ECLIPSE Cohort Study: The single best predictor of an exacerbation in the first year was a previous treated exacerbation in the year before study



	FEV1 50%-80%	FEV1 30%-50%	FEV1 < 30%
Exacerbation rate	**0.85**	**1.34**	**2**

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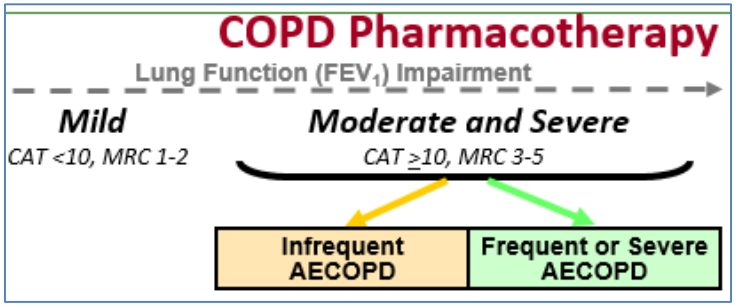
Hurst JR, et al. N Engl J Med. 2010 Sept 16;363(12):1128-38.

Assessment of AECOPD Frequency

- **FEV_1** by itself is a **poor predictor** of exacerbations or mortality
- The best predictor of frequent AE is a history of previous AECOPD
- **Frequent AECOPD** is:
  - **≥ 2** AECOPD requiring **antibiotics ± systemic corticosteroids over 2 years** or
  - **≥ 1 Severe** AECOPD requiring **hospitalization"** (© 2018 CTS)
- Pharmacotherapy needs to match treatment decisions with symptom burden and risk of future exacerbations



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Bourbeau J, et al. Can J Resp Crit Care Med 2017; 1(4):222-241

Goals of COPD Management

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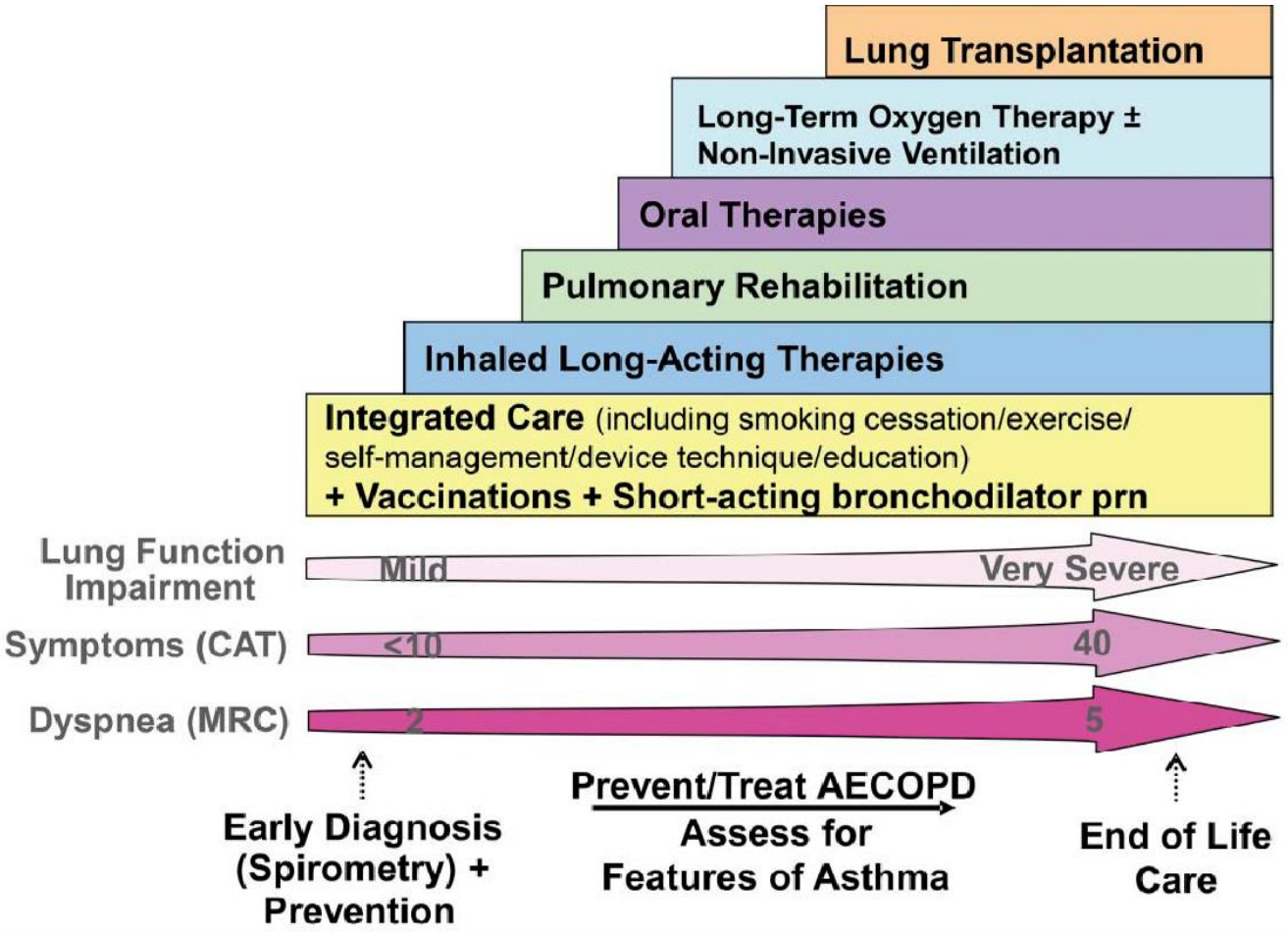
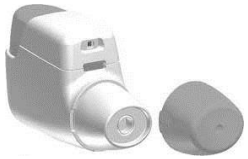
Comprehensive Management of COPD

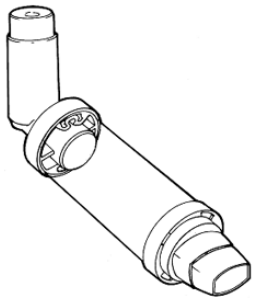


Bourbeau J, Bhutani M, Hernandez P, Marciniuk D et al. CTS position statement: Pharmacotherapy in patients with COPD—An update. Canadian Journal of Respiratory, Critical Care, and Sleep Medicine 2017; 1(4): 222-241.

Pharmacotherapy in COPD

- **Short-acting Bronchodilators:**
  - ✓ Short-Acting Beta$_2$-agonists (SABA)
  - ✓ Short-Acting Muscarinic Antagonists (SAMA)
- **Long-acting Bronchodilators:**
  - ✓ Long-Acting Muscarinic Antagonists (LAMA)
  - ✓ Long-Acting Beta$_2$-Agonists (LABA)
- **LABA/LAMA Combination**
- **ICS/LABA Combination (Inhaled Corticosteroids)**
- **ICS/LABA/LAMA (Triple therapy)**
- **Oral Theophyllines**
- **Phosphodiesterase-4 Inhibitor (roflumilast)**
- **Oral Corticosteroids (OCS)**
- **Macrolide (azithromycin)**
- **Mucolytic (N-acetylcysteine)**





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Taylor & Francis
Taylor & Francis Group

Canadian Journal of Respiratory, Critical Care, and Sleep Medicine

Revue canadienne des soins respiratoires et critiques et de la médecine du sommeil

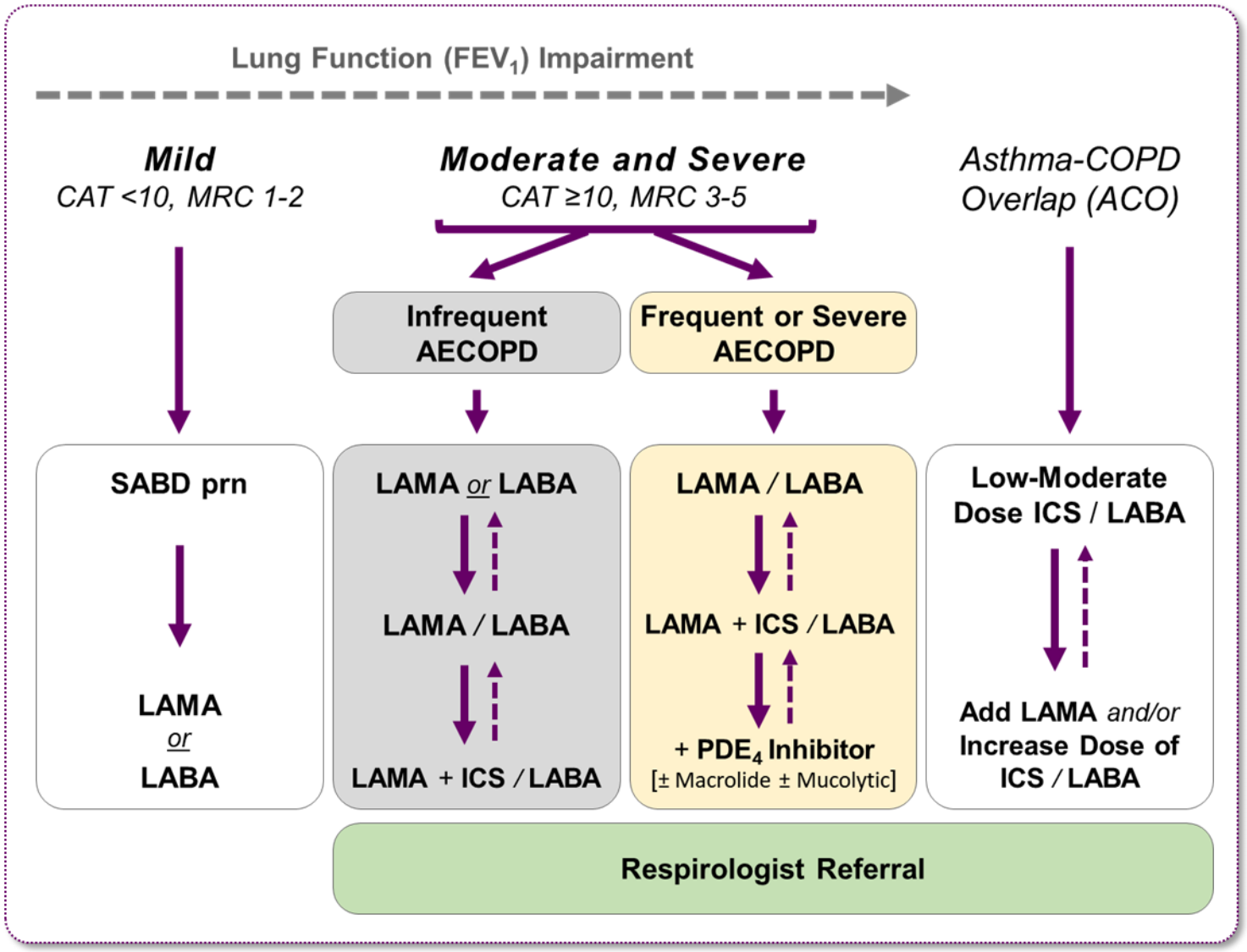
ISSN: 2474-5332 (Print) 2474-5340 (Online) Journal homepage: http://www.tandfonline.com/loi/ucts20

CTS position statement: Pharmacotherapy in patients with COPD—An update

Jean Bourbeau, Mohit Bhutani, Paul Hernandez, Darcy D. Marciniuk, Shawn D. Aaron, Meyer Balter, Marie-France Beauchesne, Anthony D'Urzo, Roger Goldstein, Alan Kaplan, François Maltais, Denis E. O'Donnell & Don D. Sin

Bourbeau J, Bhutani M, Hernandez P, Marciniuk D et al. CTS position statement: Pharmacotherapy in patients with COPD - An update. Canadian Journal of Respiratory, Critical Care, and Sleep Medicine 2017; 1(4): 222-241.

Pharmacotherapy



Bourbeau J. *Can J Respir Crit Care Sleep Med.* 2017;1(4):222-241.

What would you suggest as initial therapy?

A. Either with LAMA or LABA alone

✓ B. LAMA/LABA combination

C. Triple therapy: ICS/LABA/ LAMA

D. Theophylline

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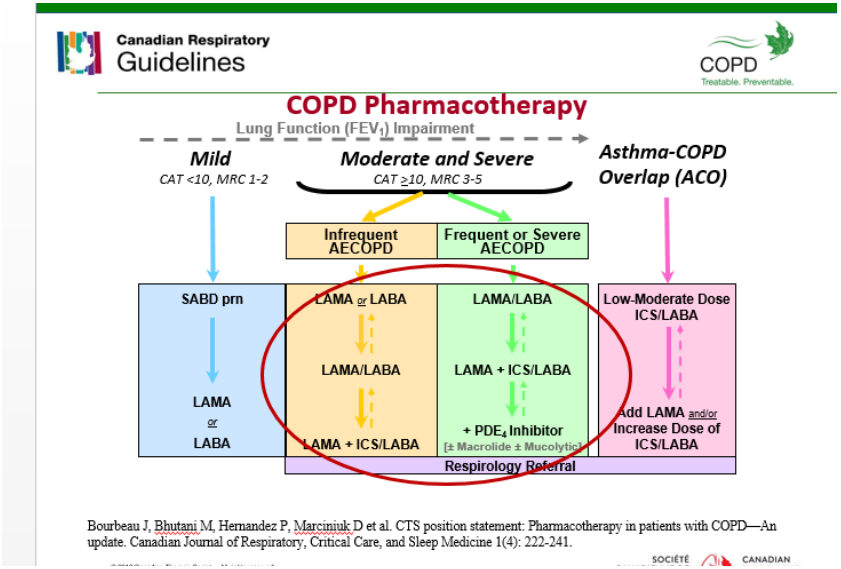
Pharmacotherapy Considerations

In symptomatic patients with stable COPD who are experiencing persistent or increased dyspnea, exercise intolerance, and/or poor health status despite the use of the current therapy, consider treatment "step up" in accordance with the CTS COPD pharmacotherapy guidelines.



Adapted from Bourbeau J, Bhutani M, Hernandez P, Marciniuk D et al. CTS position statement: Pharmacotherapy in patients with COPD—An update. Canadian Journal of Respiratory, Critical Care, and Sleep Medicine 2017;1(4): 222-241, section 1 key messages and recommendations

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Non-pharmacologic Treatments

- Smoking Cessation
- Self-management Education and Written Action Plan
- Inhaler Device Technique (check at every visit)
- Pulmonary Rehabilitation (if available)
- Exercise (for all patients)
- Vaccination (annual influenza and pneumococcal as per guidelines)
- Surgery (Lung Volume Reduction and Lung Transplant)
- Palliative and end of life care

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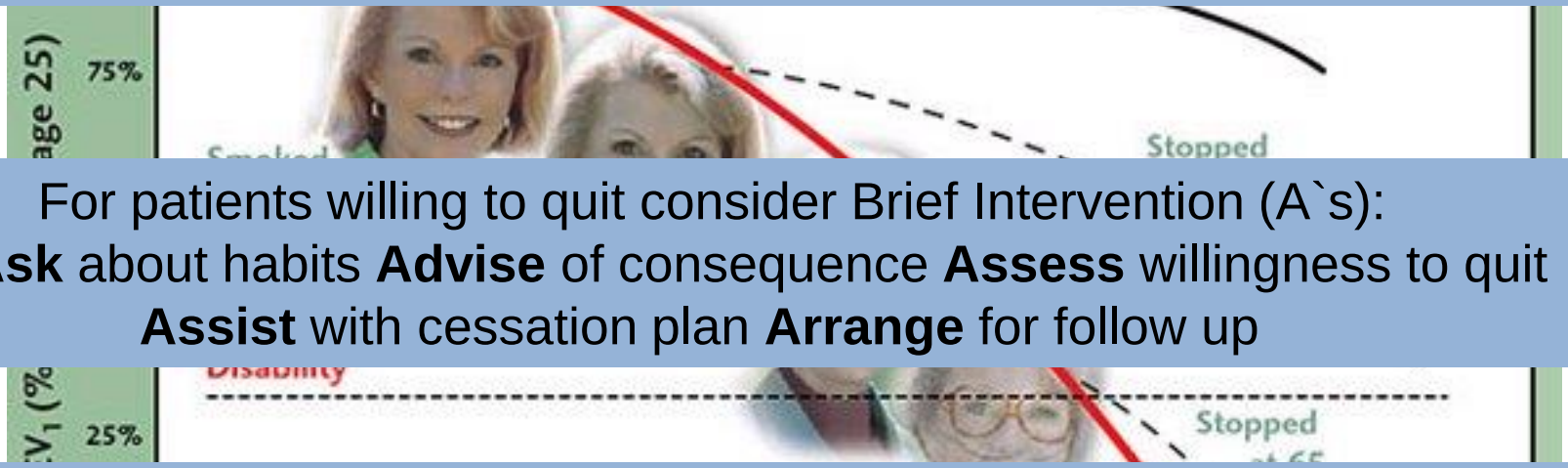
Bourbeau et al. CTS position statement; Pharmacotherapy in patients with COPD - An update; Canadian Journal of Respiratory, Critical Care, and Sleep Medicine 2017 ; © 2018 GOLD;
O'Donnell, DE, et al. CTS recommendations for management of COPD - 2008

Smoking Cessation

- Single most effective intervention to reduce the risk of developing COPD and the only intervention that has been shown to slow its progression[1]



- For patients willing to quit consider Brief Intervention (A`s):

Ask about habits **Advise** of consequence **Assess** willingness to quit **Assist** with cessation plan **Arrange** for follow up

- For patients ambivalent about quitting, consider Motivational Interviewing. MI vs. brief advice or usual care yielded a modest but significant increase in quitting.[2]

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1. O'Donnell, DE, et al. CTS recommendations for management of COPD – 2008 2. .Lindson-Hawley N et al. Motivational interviewing for smoking cessation. Cochrane Database of Systematic Reviews 2015, Issue 3.

Before Escalating Pharmacotherapy, Remember…

- Always assess patient's compliance with therapy
- Poor inhaler technique can lead to ineffective drug delivery
- The inhaler device choice will depend on:
  - ✓ Patient's ability (hand strength, cognition, eye sight, hearing)
  - ✓ Age
  - ✓ Multiple devices
  - ✓ Access
  - ✓ Cost
  - ✓ Patient's preference
- Inhaler device videos: youtube or www.on.lung.ca/inhalationdevicevideos

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Key inhaler characteristics

Aerosol velocity[1]

Rapid inhalation increases drug particle velocity, resulting in impaction within the oropharynx and large conducting airways[1]

Aerosol duration[1,2]

Duration of aerosol generation influences the need for coordination, and inhalation, which may impact lung deposition. Longer aerosol duration and slower velocity would lead to greater lung deposition

Particle size[1]

Particle size influences the site of lung deposition and the mechanism by which it is deposited. Larger particles have a greater likelihood of being deposited in the oropharynx[1]

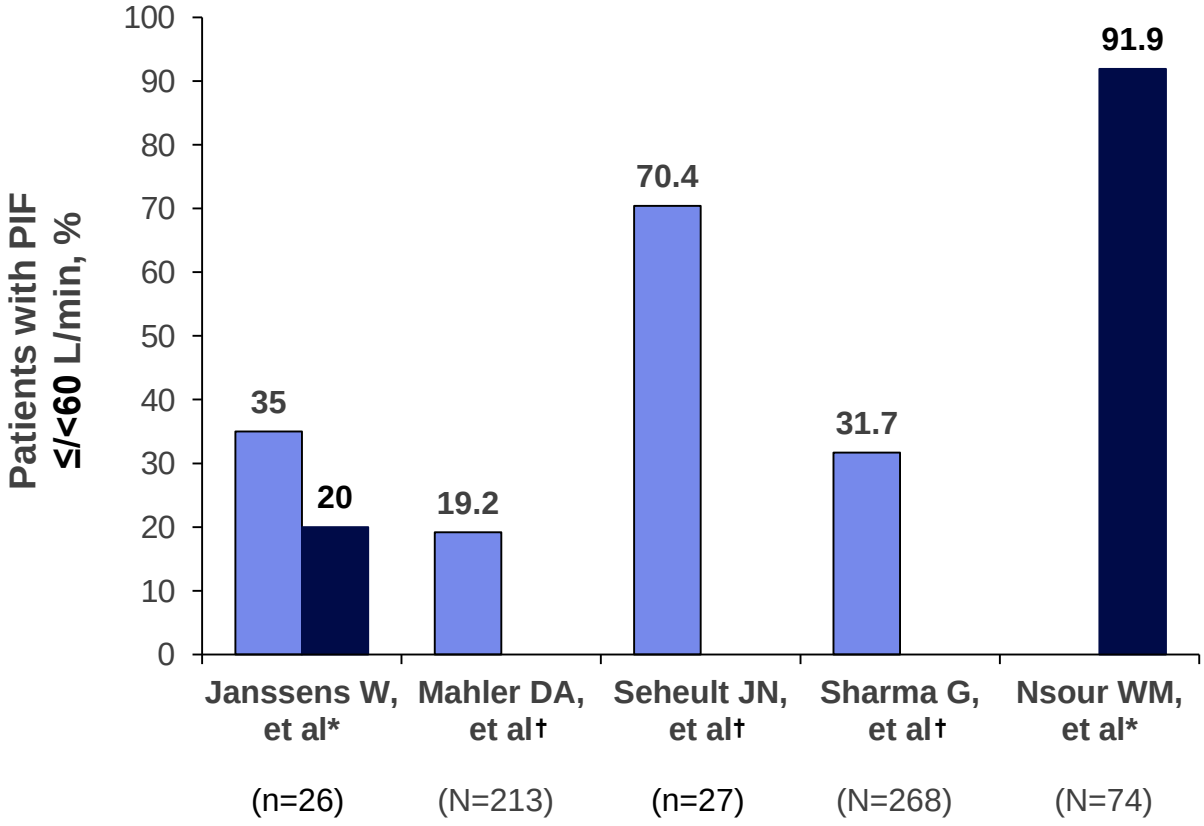
Internal device resistance[1]

Intrinsic airflow resistance influences the patient's inspiratory effort required for inhaler use; lower the resistance, lower is the required inspiratory effort[1]

The correlation between deposition data and efficacy has not been determined

1. Capstick TG and Clifton IJ. *Expert Rev Respir Med.* 2012;6:91-103; 2. Dalby RN et al. *Med Devices (Auckl).* 2011;4:145-55.

Some patients with COPD do not achieve a PIF above 60 L/min

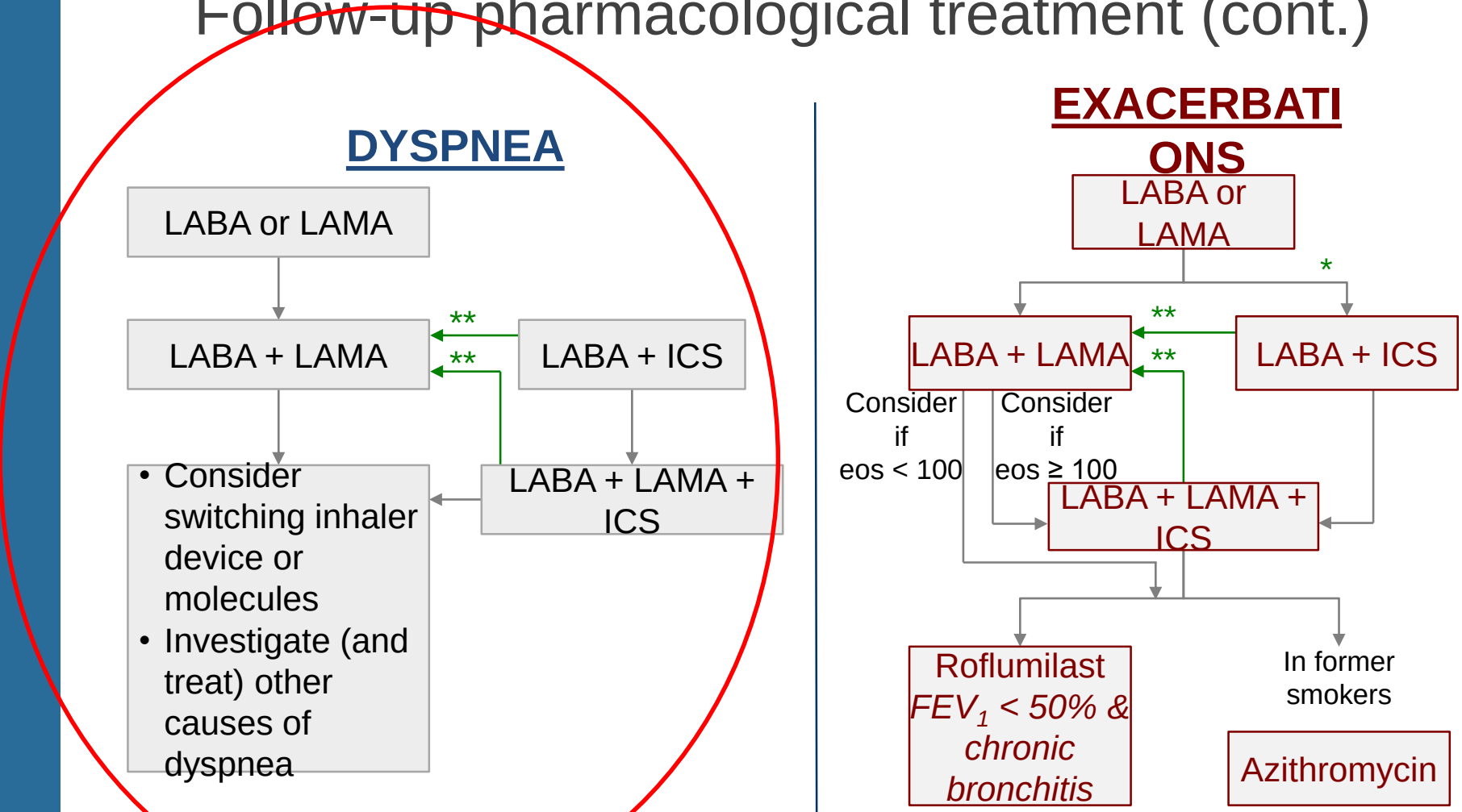


- Minimal PIF for Diskus® and Turbohaler®[6]: 30 L/min
- Suboptimal PIF for Diskus® and Turbohaler®[6]: <60 L/min

In several studies where PIF was measured through DPIs (directly or using the In-Check Dial® method), a range of patients with COPD were unable to achieve a PIF[1-5] ≥60 L/min

*PIF cut-off was <60 L/min
†PIF cut-off was <60 L/min
COPD, chronic obstructive pulmonary disease; PIF, peak inspiratory flow
1. Janssens W, et al. *Eur Respir J. 2008*;31:78-83; 2. Mahler DA, et al. *J Aerosol Med Pulm Drug Deliv*. 2013;26:174-79; 3. Seheult JN, et al. *Springerplus.* 2014;3:496; 4. Sharma G, et al. *Chronic Obstr Pulm Dis*. 2017;4:217-24; 5. Nsour WM, et al. *Resp Med*. 2001;95:865-.68; 6. Ghosh S, et al. *J Aerosol Med Pulm Drug Deliv.* 2017;30(6):381-387.

Follow-up pharmacological treatment (cont.)



*Consider if eos ≥ 300 or eos ≥ 100 AND ≥2 moderate exacerbations / 1 hospitalization
**Consider de-escalation of ICS or switch if pneumonia, inappropriate original indication or lack of response to ICS
Eos, eosinophils; ICS, inhaled corticosteroid; LABA, long-acting β_2-agonist; LAMA, long-acting muscarinic antagonist; mMRC, modified Medical Research Council

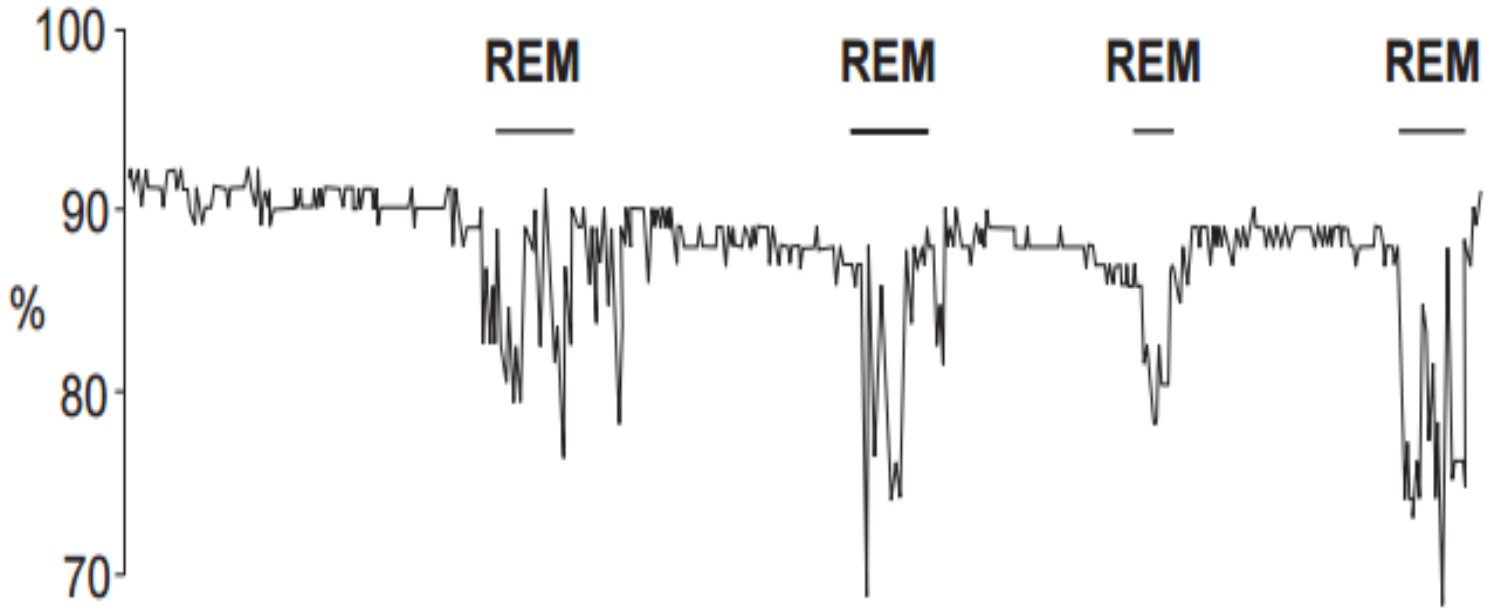
Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (2019 Report). Available at: www.goldcopd.org. Accessed November 8, 2018

What about Oxygen?

- Often starts while acutely ill in hospital and continued upon discharge
- Need to re-assess 6-12 week following hospital admission
- Long Term Oxygen therapy (15 hours or more per day) is life prolonging in patients with stable COPD and severe resting hypoxemia: Oxygen Saturation ≤88% and PaO2 ≤55 mmHg
- The 2019 GOLD guidelines advise *against* the routine practice of prescribing supplemental oxygen to stable COPD patients without severe resting hypoxemia.

O2 Saturation at Night in COPD

- Large SaO_2 falls are common in REM sleep
- Suggest the occurrence of prolonged hypoventilation



Reference: Marrone O, et al. Int J COPD. 2006;1: 263-72.

COPD: When to Refer to a Specialist

- Diagnostic uncertainty
- Symptoms are disproportionate to level of airflow obstruction
- Accelerated decline of pulmonary function
- Suspicion of Alpha-1 Antitrypsin Deficiency
- Onset of symptoms at a young age
- Severe or recurrent acute exacerbations of chronic obstructive pulmonary disease
- Failure to respond to therapy

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O'Donnell et all.Can Respir J 2008; 15 (Suppl A): 1A-8A

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Acute Exacerbations of COPD

One Year Later…

One year later Grace presents with a three-day history of increasing cough and dyspnea following a cold. She has had more than usual with increasing volume of sputum with a change in color from its usual creamy white to green. She is also experiencing a dramatic increase in dyspnea.

AECOPD or Lung Attack

- AECOPD is an acute worsening of respiratory symptoms that results in additional therapy
- Hospitalization for a AECOPD is associated with poor prognosis and increased risk of death
- Mortality related to AECOPD is similar to MI (the risk of dying is similar within the first year)[2]
- "Exacerbations are to COPD what myocardial infarctions are to coronary artery disease: they are acute, trajectory changing and often deadly manifestations of a chronic disease."[1]

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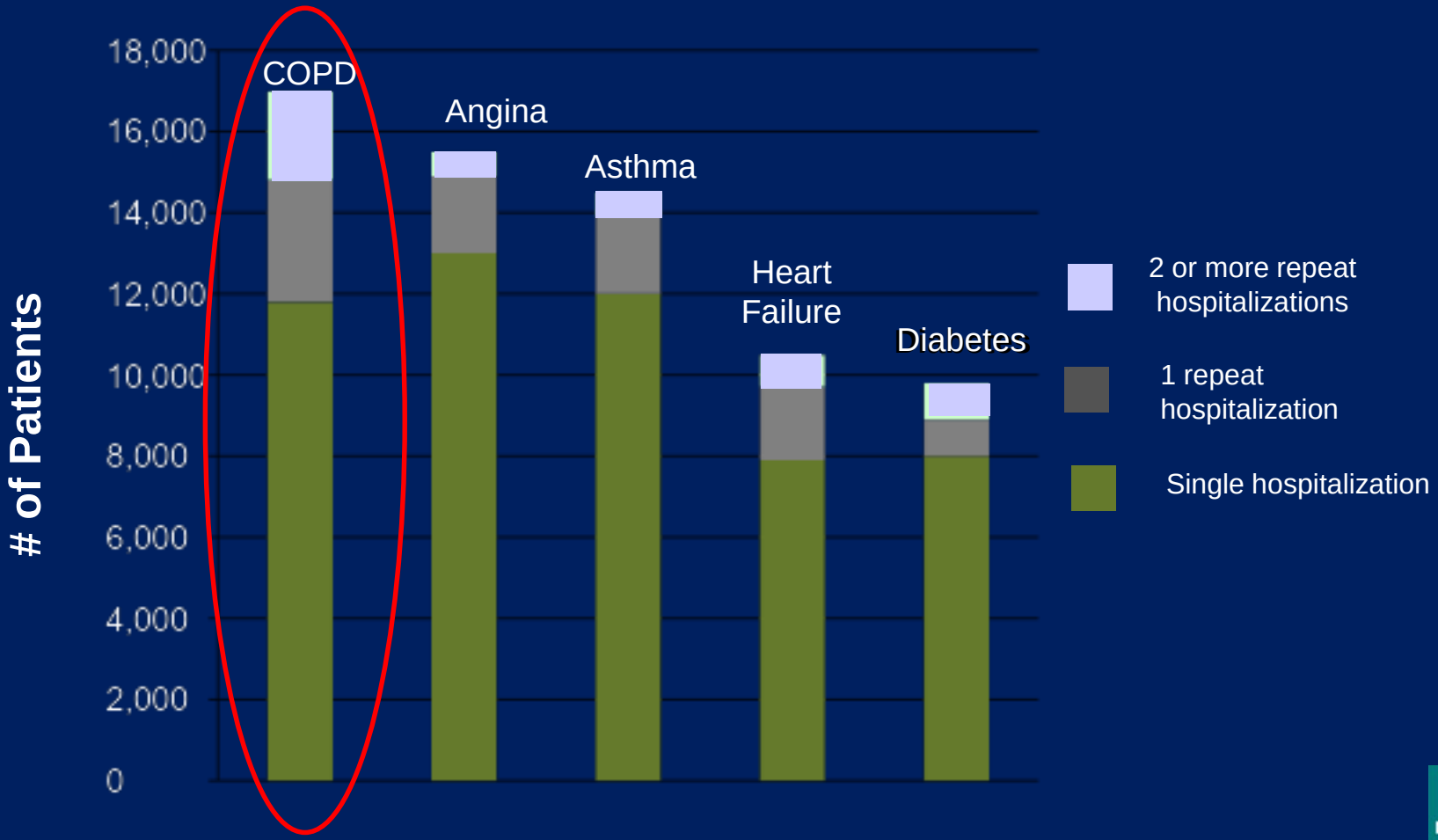
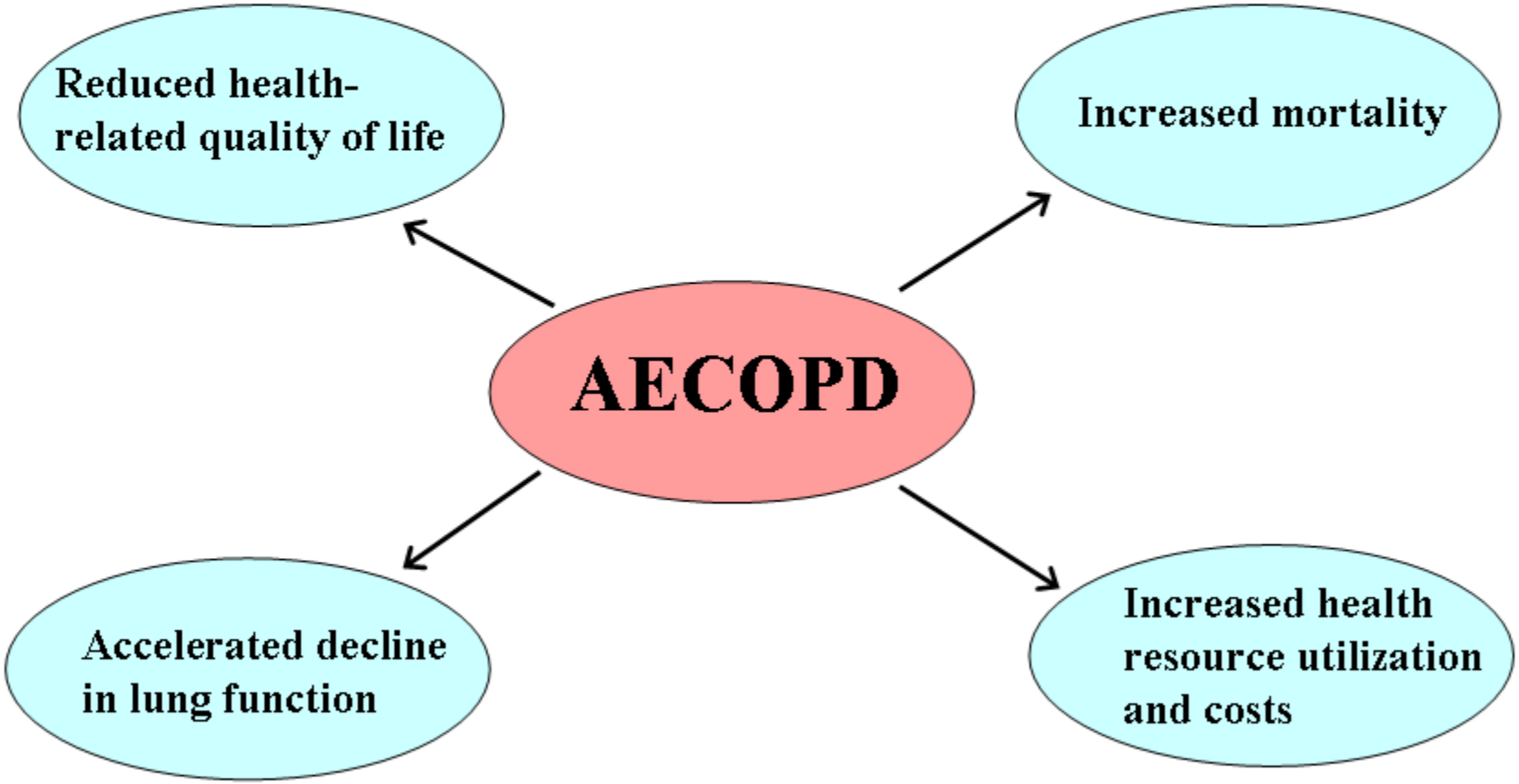
1. J. Bourbeau et al. CTS position statement Can Jour of Respir, Critical Care, and Sleep Medicine 2017
2. © 2018 GOLD 3. Bourbeau J, et al. Can J Resp Crit Care Med 2017; 1(4):222-241

AECOPD - #1 Cause for Hospital Admissions Among Chronic Illness in Canada



1. Health Indicators 2008. Canadian Institute of Health Information. Page 21.

Consequences of AECOPD



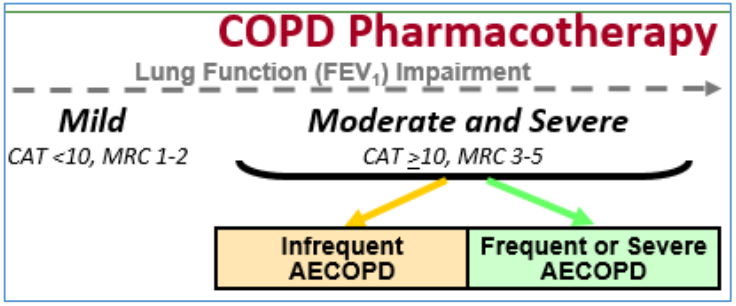
Can Respir J 2008;15(Suppl A):1A-8A.

Classification of AECOPD

- Can be:
  - **Infectious** (bacterial or viral)
  - **Non-infectious** (irritants, congestive heart failure, environmental exposure, emotional)
- Can be:
  - **Mild:** treated with short acting bronchodilators only, SABDs
  - **Moderate:** treated with SABDs plus antibiotics and/or oral corticosteroids
  - **Severe:** patient requires hospitalization or visits the emergency room. Severe exacerbations may also be associated with acute respiratory failure.

AECOPD Management in Primary Care

- Pharmacotherapy needs to match treatment decisions with symptom burden and risk of future exacerbations



  - COPD Action/Management Plan (if available)
  - Inhaled bronchodilators
  - Oral Corticosteroids
  - Antibiotics

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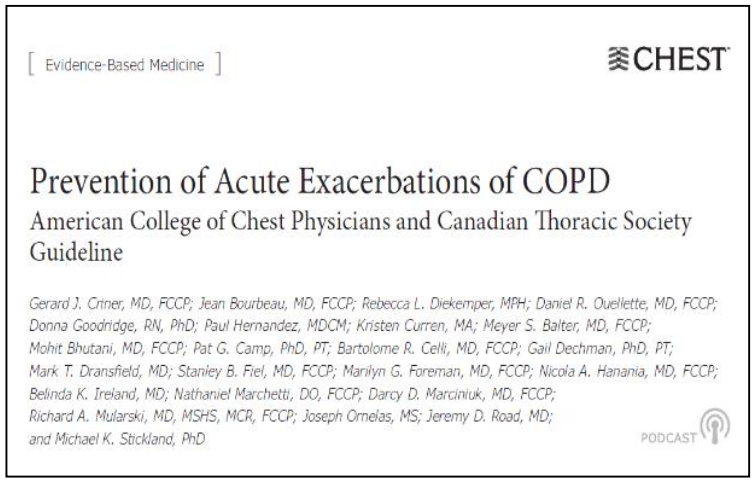
J. Bourbeau et al. CTS position statement Can Jour of Respir, Critical Care, and Sleep Medicine 2017

COPD Action Plans: Education and Case Management


[Evidence-Based Medicine]

CHEST

Prevention of Acute Exacerbations of COPD

American College of Chest Physicians and Canadian Thoracic Society Guideline

Gerard J. Criner, MD, FCCP; Jean Bourbeau, MD, FCCP; Rebecca L. Diekemper, MPH; Daniel R. Ouellette, MD, FCCP; Donna Goodridge, RN, PhD; Paul Hernandez, MDCM; Kristen Curren, MA; Meyer S. Balter, MD, FCCP; Mohit Bhutani, MD, FCCP; Pat G. Camp, PhD, PT; Bartolome R. Celli, MD, FCCP; Gail Dechman, PhD, PT; Mark T. Dransfield, MD; Stanley B. Fiel, MD, FCCP; Marilyn G. Foreman, MD, FCCP; Nicola A. Hanania, MD, FCCP; Belinda K. Ireland, MD; Nathaniel Marchetti, DO, FCCP; Darcy D. Marciniuk, MD, FCCP; Richard A. Mularski, MD, MSHS, MCR, FCCP; Joseph Ornelas, MS; Jeremy D. Road, MD; and Michael K. Stickland, PhD

PODCAST

- COPD Action Plans are a vital part of a case management program with education
- **BUT** Insufficient evidence to support their use without case management or "direct access to a health-care specialist at least monthly"

- "In patients with moderate to severe COPD, we suggest education together with an action plan but without case management does not prevent severe acute exacerbations of COPD" (ED visit or hospitalizations) (Grade 2C)
- "For patients with COPD, we suggest education with a written action plan and case management for the prevention of severe acute exacerbations of COPD" (ED visit or hospitalizations) (Grade 2B)

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Criner, JC at al Prevention of AECOPD, CHEST April 2015

One Month Follow-up…

Following her previous visit Grace was started on Clavulin 500 mg BID for 7 days and prednisone 30 mg daily for 5 days. Her sputum clears and she becomes less dyspneic. You follow her up one month later and she is back to baseline.

You want to give her an COPD Management plan. For her yellow zone, you would:

A. Continue LAMA/LABA as prescribed for the green zone

B. Change LAMA/LABA to ICS/LAMA/LABA

✓ C. Add antibiotic and/or prednisone

D. Start Roflumilast

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How to Fill Out a COPD Management Plan

- Review history of previous AECOPD and assess the risk
- Encourage the patient to self monitor
- Give clear direction when to use an antibiotic
- Give clear direction when to use corticosteroid
- Ensure that action plan meds are available
- What to do if symptoms get worse, who to call, where to go
- Follow-up review after exacerbation

My COPD Action Plan

Educator's Copy

_____ Date _____

(Patient's Name)

Canadian Respiratory Guidelines

COPD
Treatable. Preventable.

This is to tell me how I will take care of myself when I have a COPD Flare-up.

My goals are _____

My support contacts are _____ and _____

(Name & Phone #) (Name & Phone #)

My Symptoms	I Feel Well	I Feel Worse	I Feel Much Worse URGENT
I have sputum.	My usual sputum colour is: _____	Changes in my sputum, for at least 2 days. *Yes* ☐ *No* ☐	My symptoms are not better after taking my flare-up medicine for 48 hours.
I feel short of breath.	When I do this: _____	OR More short of breath than usual for at least 2 days. *Yes* ☐ *No* ☐	I am very short of breath, nervous, confused and/or drowsy, and/or I have chest pain. 

My Actions	Stay Well	Take Action	Call For Help
	I use my daily puffers as directed.	If I checked 'Yes' to one or both of the above, I use my prescriptions for COPD flare-up.	I will call my support contact and/or see my doctor and/or go to the nearest emergency deptartment.
	If I am on oxygen, I use _____L/min.	I use my daily puffers as usual. If I am more short of breath than usual, I will take ____ puffs of _____ up to a maximum of ____ times per day.	**I will dial 911.** 
		I use my breathing and relaxation methods as taught to me. I pace myself to save energy.	
		If I am on oxygen, I will increase it from ___ L/min to ___ L/min.	

Notes: _____

Important information: I will tell my doctor, respiratory educator, or case manager **within 2 days** if I had to use any of my flare-up prescriptions **AND** I will make follow-up appointments to review this COPD Action Plan twice a year.

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CANADIAN THORACIC SOCIETY SOCIÉTÉ CANADIENNE DE THORACOLOGIE

Produced in collaboration with the *COPD & Asthma Network of Alberta (CANA)*. *The Canadian Thoracic Society (CTS)* acknowledges the past contributions of *Living well with COPD* and the *Family Physician Airways Group of Canada*.

My COPD Action Plan _____ Date _____
Physician's Copy
(Patient's Name)

Canadian Respiratory Guidelines

COPD
Treatable. Preventable.

This is to tell me how I will take care of myself when I have a COPD Flare-up.

My goals are _____

My support contacts are _____ and _____
(Name & Phone #) (Name & Phone #)

Prescriptions for COPD Flare-up (Patient to fill as needed for symptoms)

These prescriptions may be refilled two times each, as needed, for 1 year to treat COPD Flare-ups. Pharmacists may fax the doctor's office once any part of this prescription has been filled.

_____ _____
Patient's Name Patient Identifier (e.g. DOB, PHN)

1. (A) If the colour of your sputum **CHANGES**, start antibiotic _____ Dose:_____ #pills:_____
How often_____ for #days:____

(B) If the first antibiotic was taken for a flare-up in the last 3 months, use this different antibiotic instead:
start antibiotic _____ Dose:_____ #pills:_____
How often_____ for #days:____

AND / OR

2. If you are MORE short of breath than usual, start prednisone _____ Dose:_____ #pills:_____
How often:_____ for # days:____

Once I start any of these medicines, I will tell my doctor, respiratory educator, or case manager within 2 days.

_____ _____ _____
Doctor's Name Doctor's Fax Doctor's Signature

_____ _____
License Date

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CANADIAN SOCIÉTÉ THORACIC SOCIETY CANADIENNE DE THORACOLOGIE

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When to Consider Antibiotic

Cardinal symptoms:

- Dyspnea, increase in sputum volume, and purulent sputum

Antibiotic Treatment Recommendations for Acute COPD Exacerbations[1,2]

Group	Probable Pathogens	First Choice	Alternatives for Treatment Failure
I, Simple Smokers FEV1 > 50% ≤ 3 exacerbations per year	H. influenzae M. catarrhalis S. pneumoniae	Amoxicillin, 2nd or 3rd generation cephalosporin, doxycycline, extended spectrum macrolide, trimethoprimsulfamethoxazole (in alphabetical order).	Fluoroquinolone β-lact/ β-lactamase inhibitor.
II, Complicated, as per I, plus at least one of the following should be present: FEV1<50% predicted; ≥4 exacerbations/ year; ischemic heart disease; use home oxygen or chronic oral steroids; antibiotic use in the past 3 months.	As in group I, plus: Klebsiella spp. and other Gram-negative bacteria Increased probability of β-lactam resistance.	Fluoroquinolone β-lact/ β-lactamase inhibitor (in order of preference).	May require parenteral therapy. Consider referral to a specialist or hospital.
III, Chronic Suppurative II, plus: Constant purulent sputum; some have bronchiectasis; FEV1 usually <35% predicted; chronic oral steroid use; multiple risk factors.	As in group II, plus: P. Aeruginosa and multi-resistant Enterobacteriaceae.	Ambulatory - tailor treatment to airway pathogen; P. Aeruginosa is common (ciprofloxacin) Hospitalized - parenteral therapy usually required.	

When to Consider Costicosteroid

- Antibiotics are used when there is evidence of purulent sputum
- Prednisone is used if there is increased dyspnea and respiratory distress
- 40 mg daily x 5 days

Predictors of bad outcomes in COPD exacerbation

Total the points for the following items:

Items		Points
1. Initial assessment		
a)	History of CABG	(1) ____
b)	History of intervention for PVD	(1) ____
c)	History of intubation for respiratory distress	(2) ____
d)	Heart rate on ED arrival > 110	(2) ____
2. Investigations		
a)	ECG has acute ischemic changes	(2) ____
b)	Chest x-ray has any pulmonary congestion	(1) ____
c)	Hemoglobin < 100 g/L	(3) ____
d)	Urea 12 mmol/L	(1) ____
e)	Serum CO_2 35 mmol/L	(1) ____
3. Re-Assessment after ED treatment		
a)	SaO_2 < 90% on room air or usual O_2, or HR 120	(2) ____
	Total score (0–16):	____

COPD risk categories for serious adverse events

Total score	Risk, %	Category
0	2.2	Low
1	4.0	Medium
2	7.2	Medium
3	12.5	High
4	20.9	High
5	32.9	Very high
6	47.5	Very high
7	62.6	Very high
8	75.6	Very high
10	91.4	Very high

Stiell I, et al. Clinical validation of risk scale for serious outcomes among patients with COPD managed in ER. CMAJ Jan 2019 p 19

Indications for Hospitalization:

Potential indications for hospitalization assessment
• Severe symptoms such as sudden worsening of resting dyspnea, high respiratory rate, decreased O_2 saturation, confusion, drowsiness
• Acute respiratory failure
• Onset of new physical signs (cyanosis, peripheral edema
• Failure of an exacerbation to respond to initial medical management
• Presence of serious comorbidities
• Insufficient home support

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AECOPD Management: in Acute Care

Oxygen: titrate to improve hypoxemia to target saturation of 88-92%.

Bronchodilators: **SABA** with or without SAMA are preferred

Systemic Corticosteroids: A dose of 40 mg prednisone per day for 5 days is recommended

Antibiotics should be given to patients:

- With THREE cardinal symptoms: increased dyspnea, increased sputum volume, and increased sputum purulence

***Mechanical Ventilator Support*:**

- **Non-invasive ventilation (BiPAP)**
- **Invasive mechanical ventilation**

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How can you prevent future AECOPD?

- ✓ A. Pneumococcal Vaccination
- ✓ B. Step-up to triple therapy: ICS/LABA + LAMA
- ✓ C. Review Proper Inhaler Technique
- ✓ D. COPD Management Plan
- ✗ E. Pulmonary Rehabilitation 3 months post AECOPD

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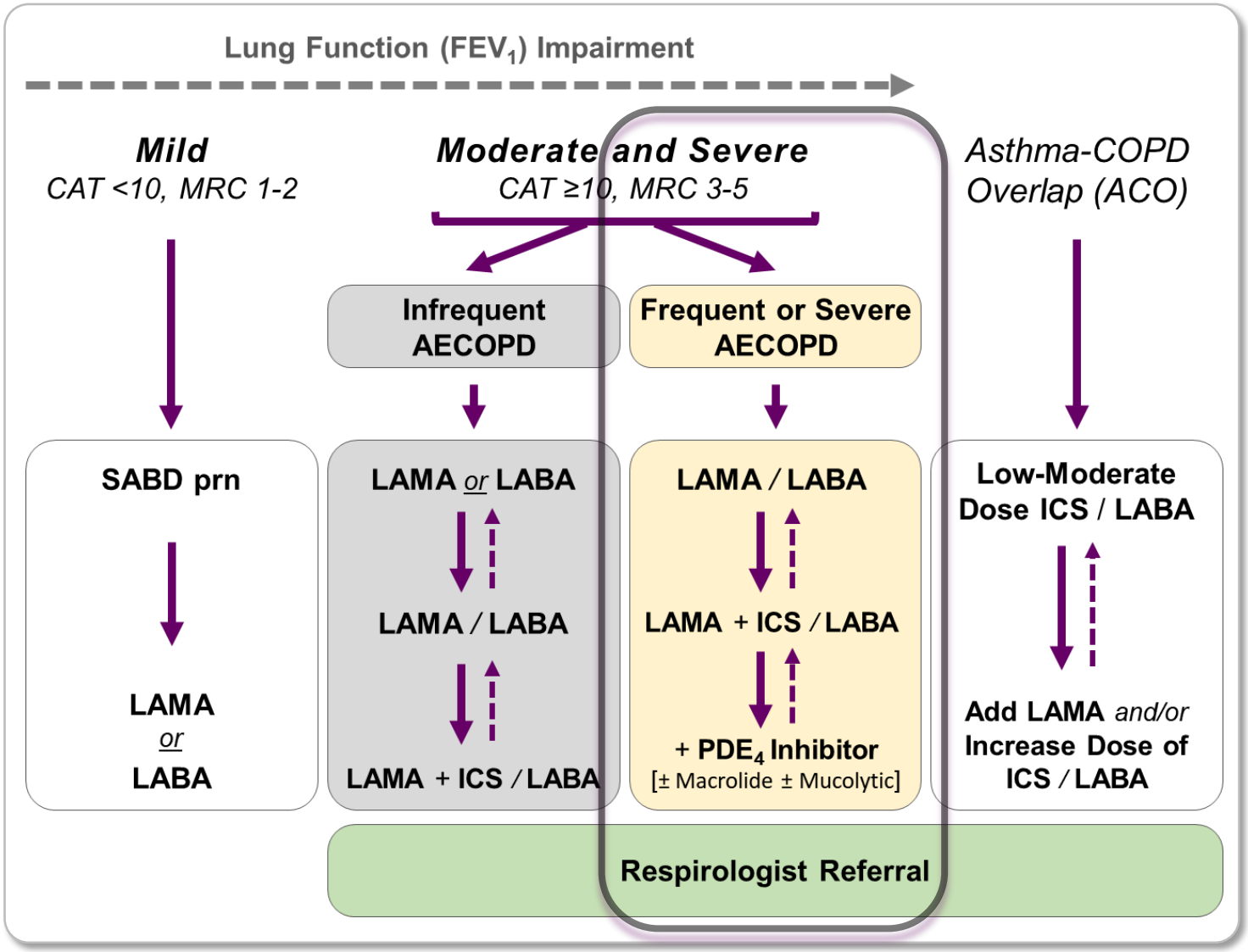
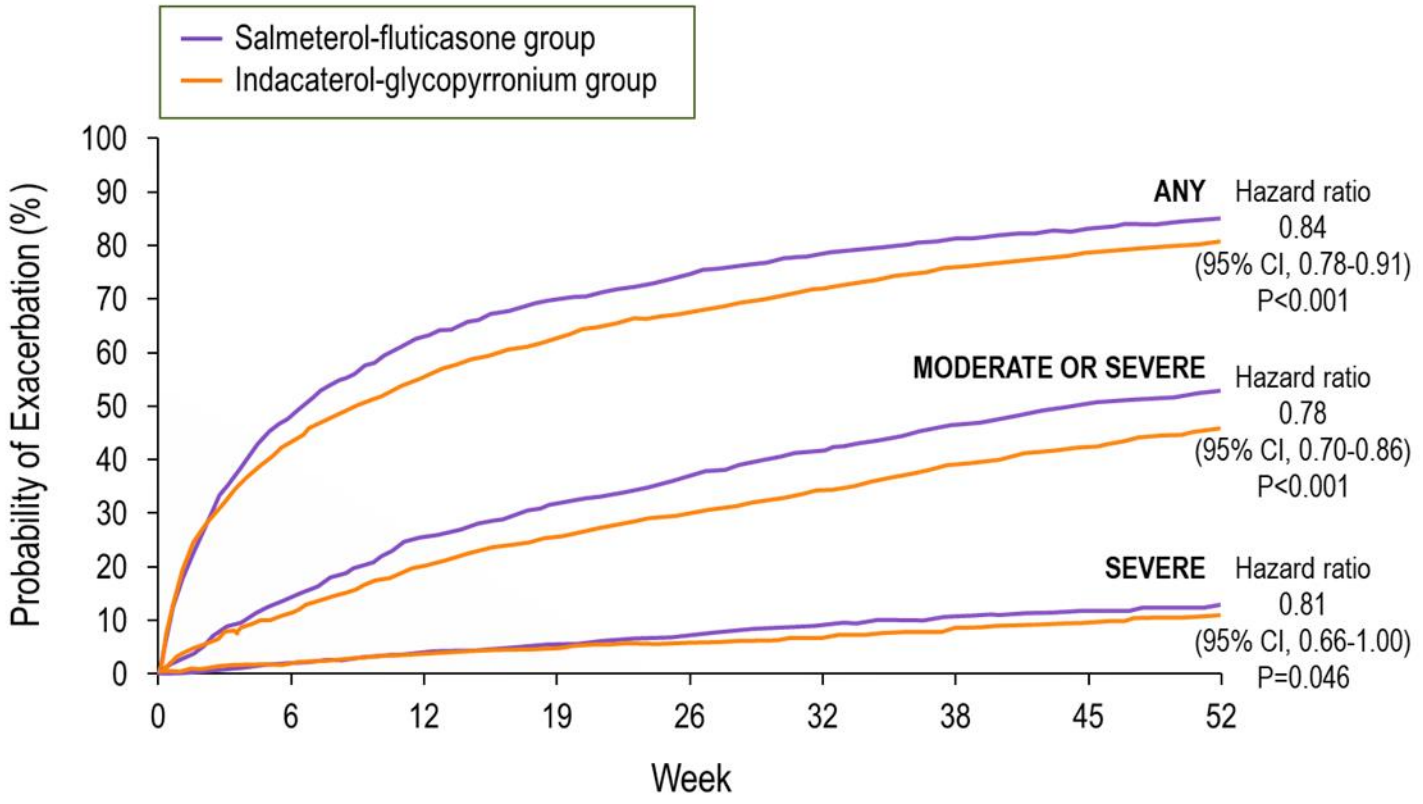
Pharmacotherapy



Bourbeau J. *Can J Respir Crit Care Sleep Med.* 2017;1(4):222-241

LAMA/LABA dual therapy:

FLAME study



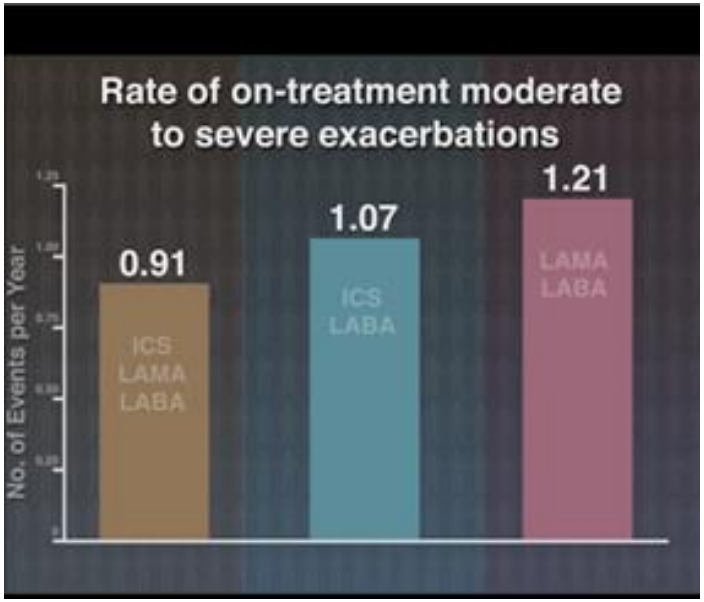
Majority of FLAME patients: GOLD B

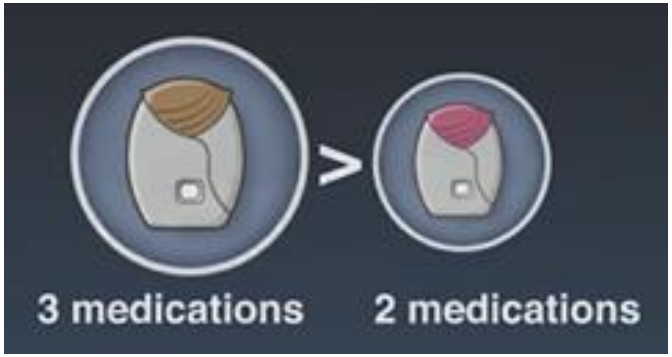
Wedzicha JA. *N Engl J Med.* 2016;374(23):2222-2234.

Triple Inhaler: ICS/LABA/LAMA

Generic Name (Brand Name)	Inhaler Device
fluticasone furoate/umeclidinium/vilanterol (Trelegy ®)	DPI Ellipta

IMPACT Trial: Triple therapy ICS/LABA/LAMA is superior to LAMA/LABA or ICS/LABA in patients with symptomatic COPD and Hx of a previous AECOPD for AECOPD prevention, hospitalizations and symptom outcomes





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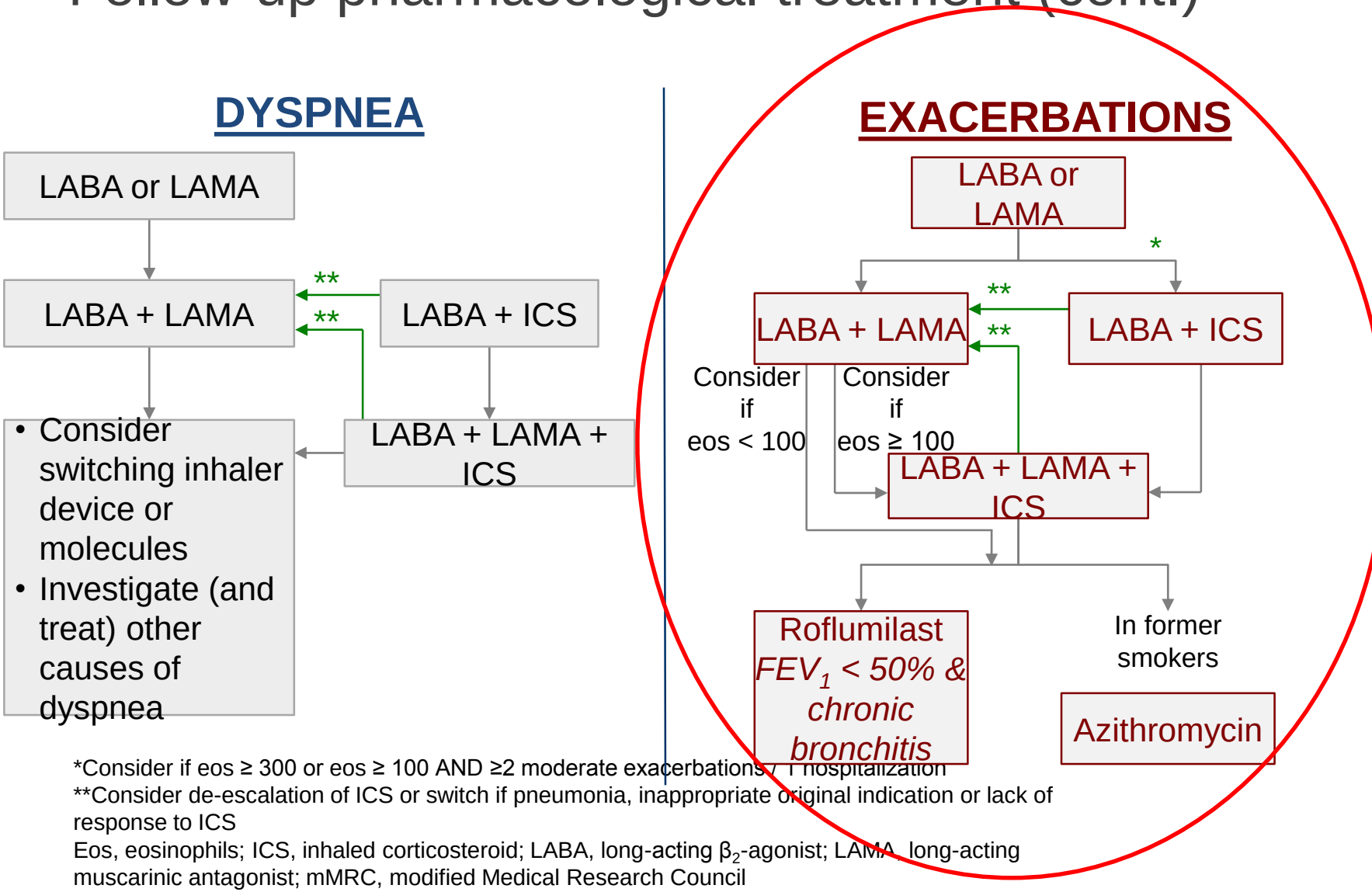
DA Lipson et al, N Engl J Med 2018; 378:1671-1680

Follow-up pharmacological treatment (cont.)



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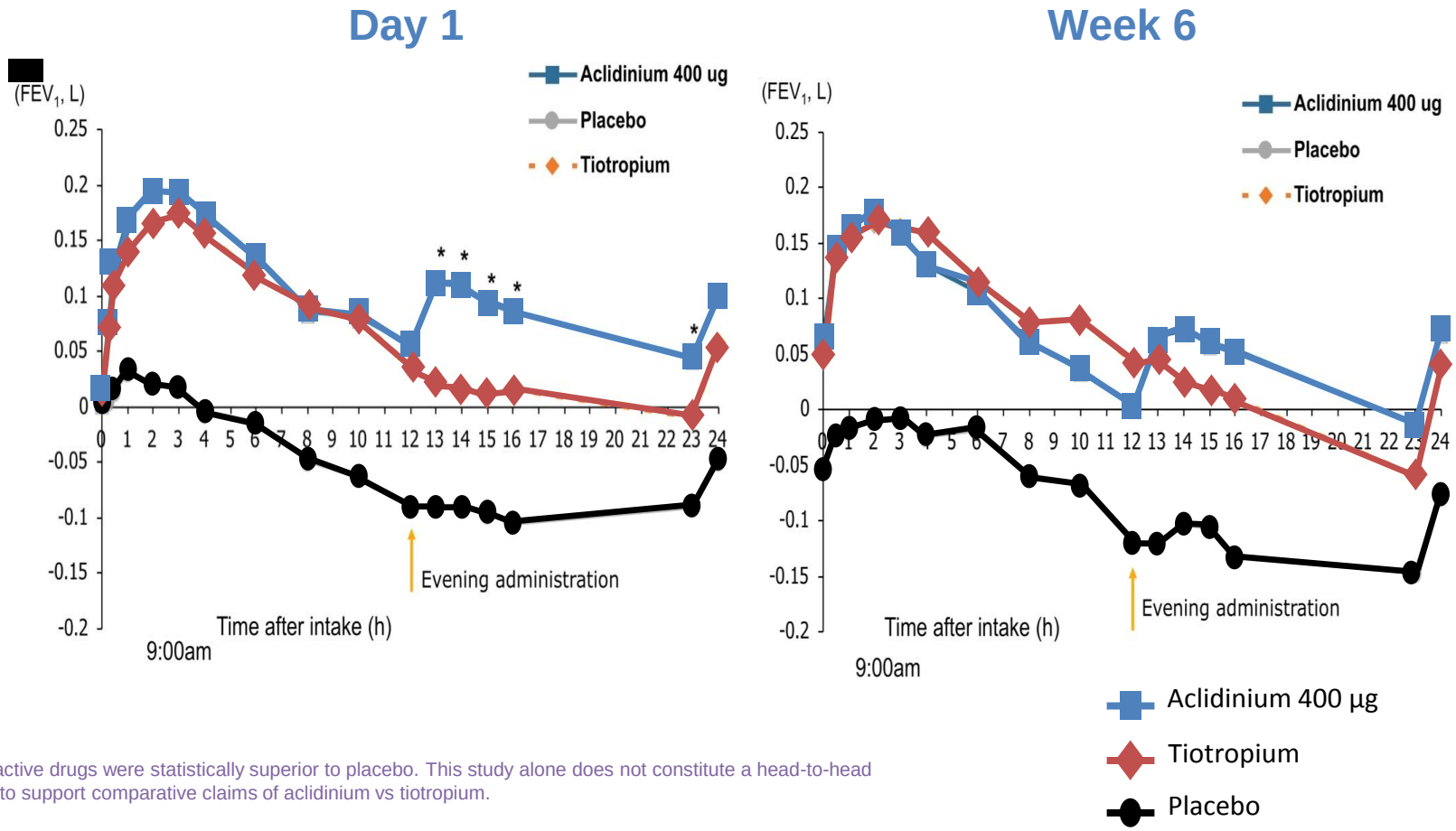
Eos, eosinophils; ICS, inhaled corticosteroid; LABA, long-acting β_2-agonist; LAMA, long-acting muscarinic antagonist; mMRC, modified Medical Research Council

Global Initiative for Chronic Obstructive Lung Disease (GOLD). Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease (2019 Report). Available at: www.goldcopd.org. Accessed November 8, 2018

Twice-Daily LAMA vs. Once-Daily LAMA: "Bedtime Boost"

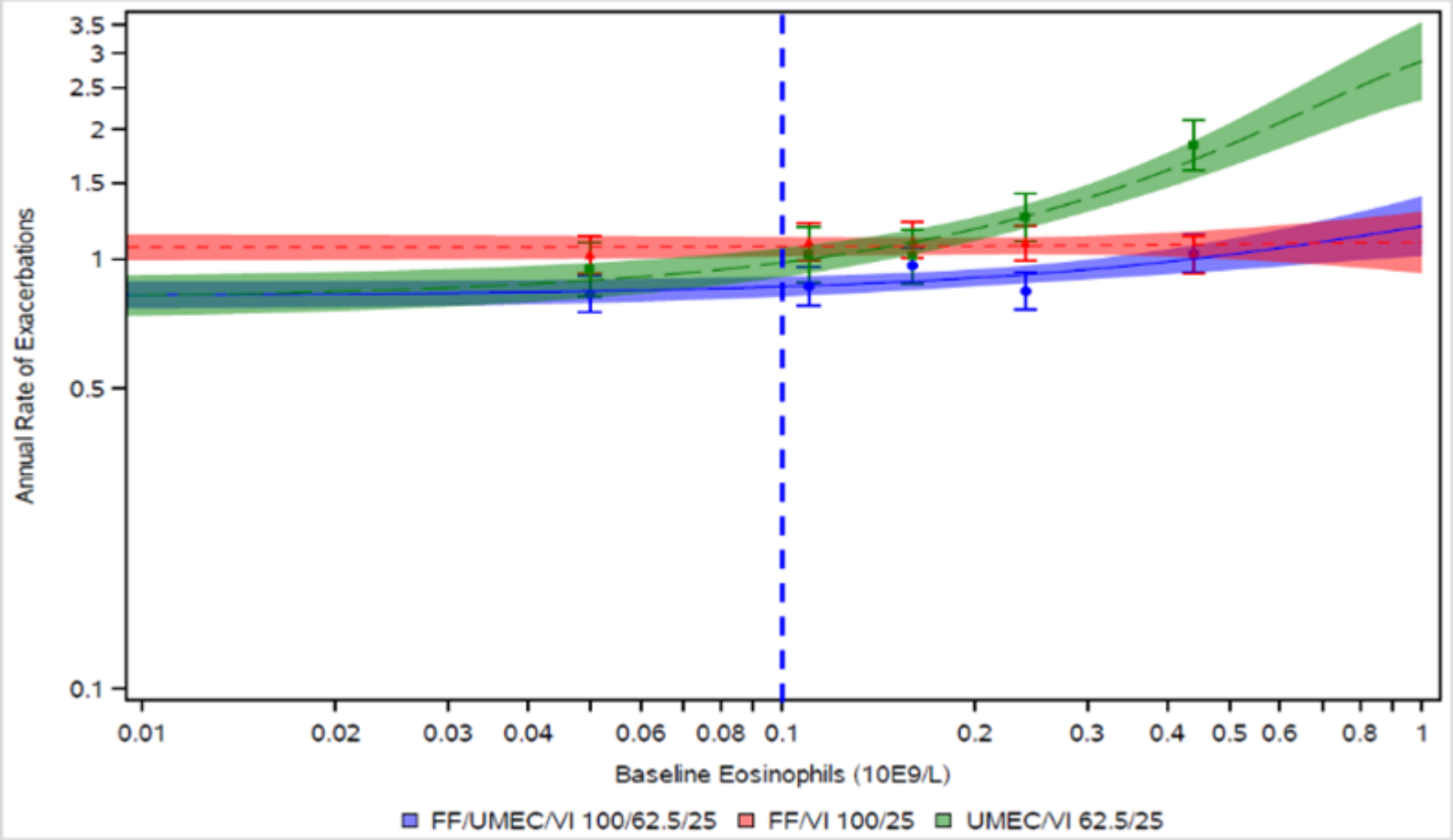


Both active drugs were statistically superior to placebo. This study alone does not constitute a head-to-head study to support comparative claims of aclidinium vs tiotropium.

Reference: Beier J, et al. COPD. ***2013;10:511-22****.*

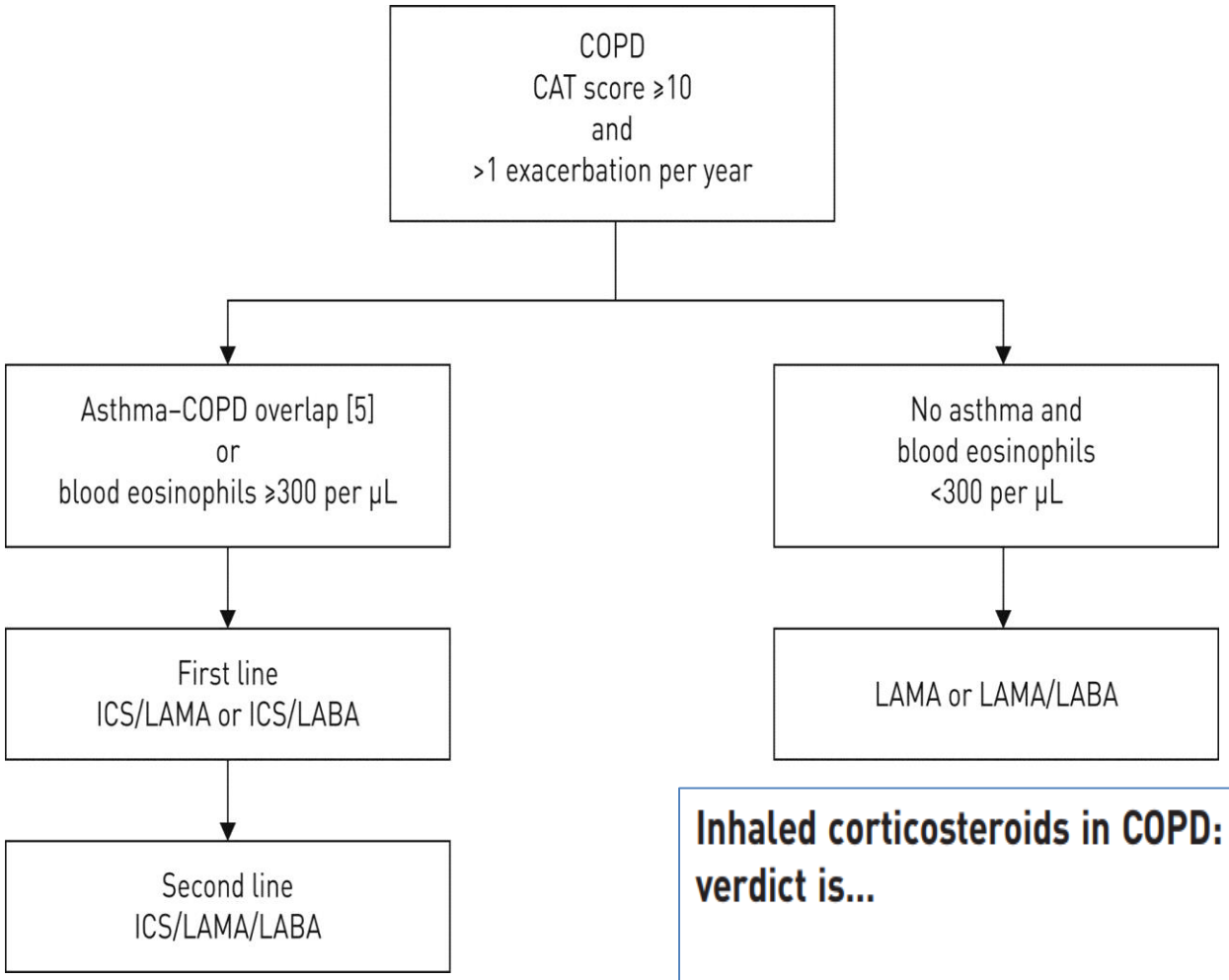
IMPACT study

Blood eosinophil counts and treatment response



S Pascoe et al. ERS 2018 OA2127

A proposed approach to management of symptomatic chronic obstructive pulmonary disease (COPD) patients with a significant history of exacerbations.



Janice M. Leung, and Don D. Sin Eur Respir J 2018;52:1801940

Inhaled corticosteroids in COPD: the final verdict is...

Janice M. Leung and Don D. Sin

Affiliation: Centre for Heart Lung Innovation, St Paul's Hospital and Division of Respiratory Medicine, University of British Columbia, Vancouver, BC, Canada.

Correspondence: Don D. Sin, Room 348, Burrard Building, St Paul's Hospital, Vancouver, BC, V6Z 1Y6, Canada. E-mail: don.sin@hli.ubc.ca

Vaccinations for COPD

- Influenza vaccination can reduce serious illness (such as lower respiratory tract infections requiring hospitalization) and death in COPD patients.

- Pneumococcal vaccinations, PCV13 and PPSV23, are recommended for all patients ≥ 65 years of age

Table 3.2. Vaccination for stable COPD

- Influenza vaccination reduces serious illness and death in COPD patients **(Evidence B)**.
- The 23-valent pneumococcal polysaccharide vaccine (PPSV23) has been shown to reduce the incidence of community-acquired pneumonia in COPD patients aged < 65 years with an FEV_1 < 40% predicted and in those with comorbidities **(Evidence B)**.
- In the general population of adults ≥ 65 years the 13-valent conjugated pneumococcal vaccine (PCV13) has demonstrated significant efficacy in reducing bacteremia and serious invasive pneumococcal disease **(Evidence B)**.

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Pulmonary Rehabilitation for COPD

Most important non-pharmacological intervention

- Strong recommendations:
  - ✓ Patients with moderate, severe, and very severe COPD
  - ✓ PR **within one month** following an AECOPD
  - ✓ Longer PR programs, beyond 6 to 8 weeks
- Improves dyspnea, strength and exercise endurance
- Reduces healthcare visits and risk of hospitalizations
- Enhances self-efficacy, confidence, health-related quality of life

Marciniuk, DD, et al. Optimizing PR in COPD
CTS CRJ July/August 2010

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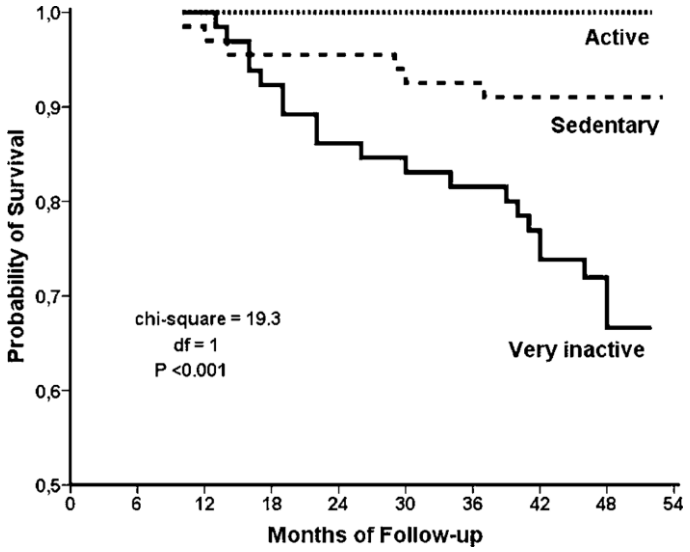
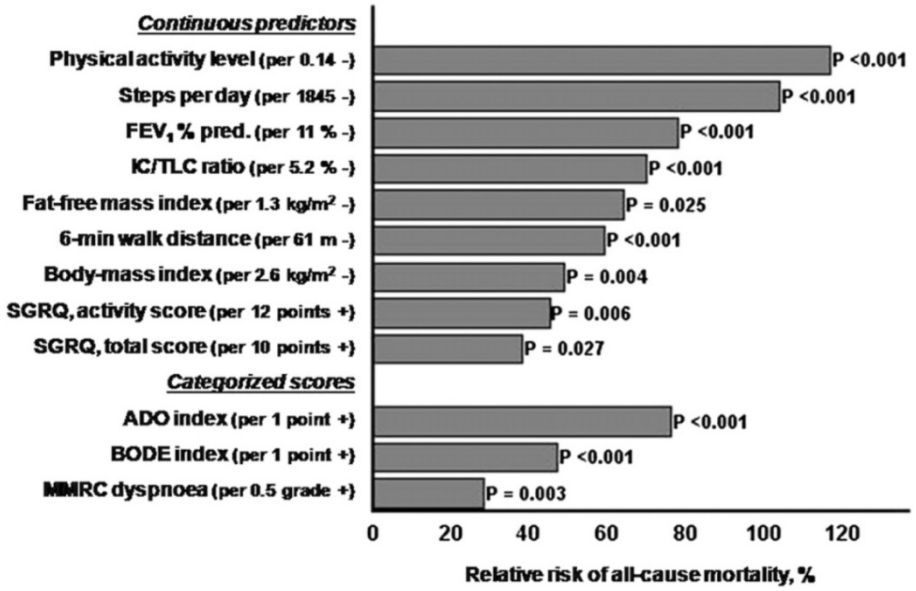
Physical Activity Level is the Strongest Predictor of All-Cause Mortality in Patients With COPD





Waschki et al. CHEST 2011 140, 331-342.

What is Next for Grace?

- 3 years later Grace has been going steadily downhill.
- Her dyspnea is worse (MRC grade 5), she is struggling to wash and dress herself.
- Her ankle edema has increased.
- She became acutely short of breath one morning, called 911, and was admitted.
- She was found to be hypoxemic with an arterial oxygen saturation of 84% on room air. She was in respiratory failure with a PCO2 of 55 mmHg.
- She was offered BiPAP but refused it. She wants to go home to die in her own bed.
- Her daughter had been concerned about her mother's deterioration at home and has just arrived from England.
- An urgent family meeting is arranged and her family physician is invited to attend.

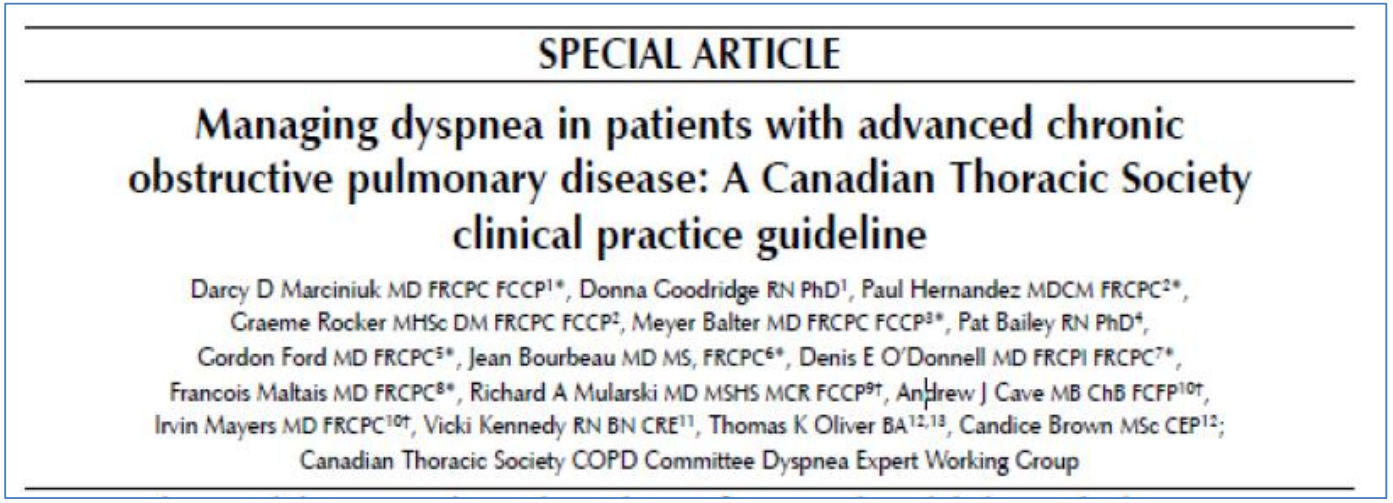
What Happens as COPD progresses?

The features of advanced disease include:

- Very severe airflow obstruction (FEV_1 less than 30% predicted; inspiratory capacity less than 80% predicted)
- Poor functional status (MRC grades 4 to 5)
- Poor nutritional status (BMI < 19 kg/m^2)
- Presence of pulmonary hypertension
- Recurrent severe AECOPD requiring hospitalization
- Persistent refractory dyspnea

Adapted O'Donnell et all.Can Respir J 2008; 15 (Suppl A): 1A-8A

What is Refractory Dyspnea?



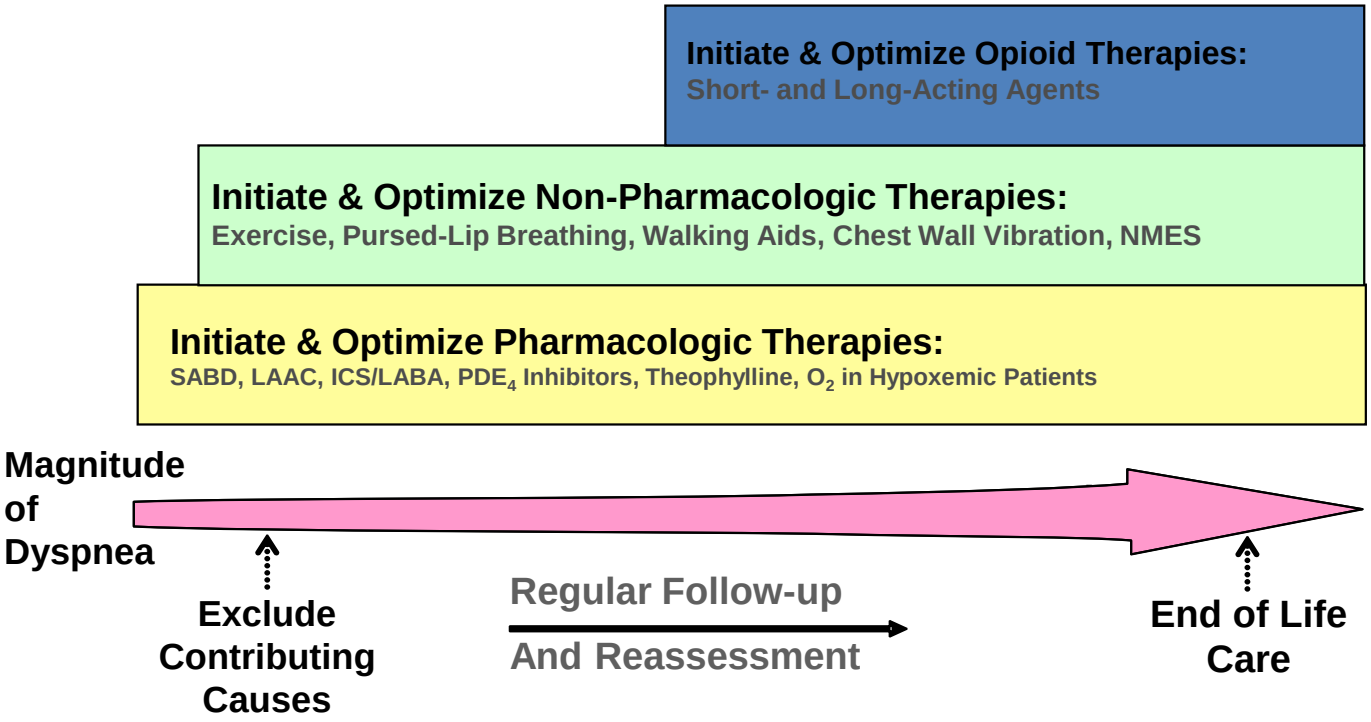
SPECIAL ARTICLE

Managing dyspnea in patients with advanced chronic obstructive pulmonary disease: A Canadian Thoracic Society clinical practice guideline

Darcy D Marciniuk MD FRCPC FCCP[1*], Donna Goodridge RN PhD[1], Paul Hernandez MDCM FRCPC[2*], Graeme Rocker MHSc DM FRCPC FCCP[2], Meyer Balter MD FRCPC FCCP[3*], Pat Bailey RN PhD[4], Gordon Ford MD FRCPC[5*], Jean Bourbeau MD MS, FRCPC[6*], Denis E O'Donnell MD FRCPI FRCPC[7*], Francois Maltais MD FRCPC[8*], Richard A Mularski MD MSHS MCR FCCP[9†], Andrew J Cave MB ChB FCFP[10†], Irvin Mayers MD FRCPC[10†], Vicki Kennedy RN BN CRE[11], Thomas K Oliver BA[12,13], Candice Brown MSc CEP[12]; Canadian Thoracic Society COPD Committee Dyspnea Expert Working Group

- Affects up to 50% of patients with advanced COPD
- Profoundly Impacts QoL for patients with advanced COPD
- "…COPD patients at the end of life experience more dyspnea than lung cancer patients and, yet, are often prescribed less medication and have less access to comprehensive care than patients dying from lung cancer."

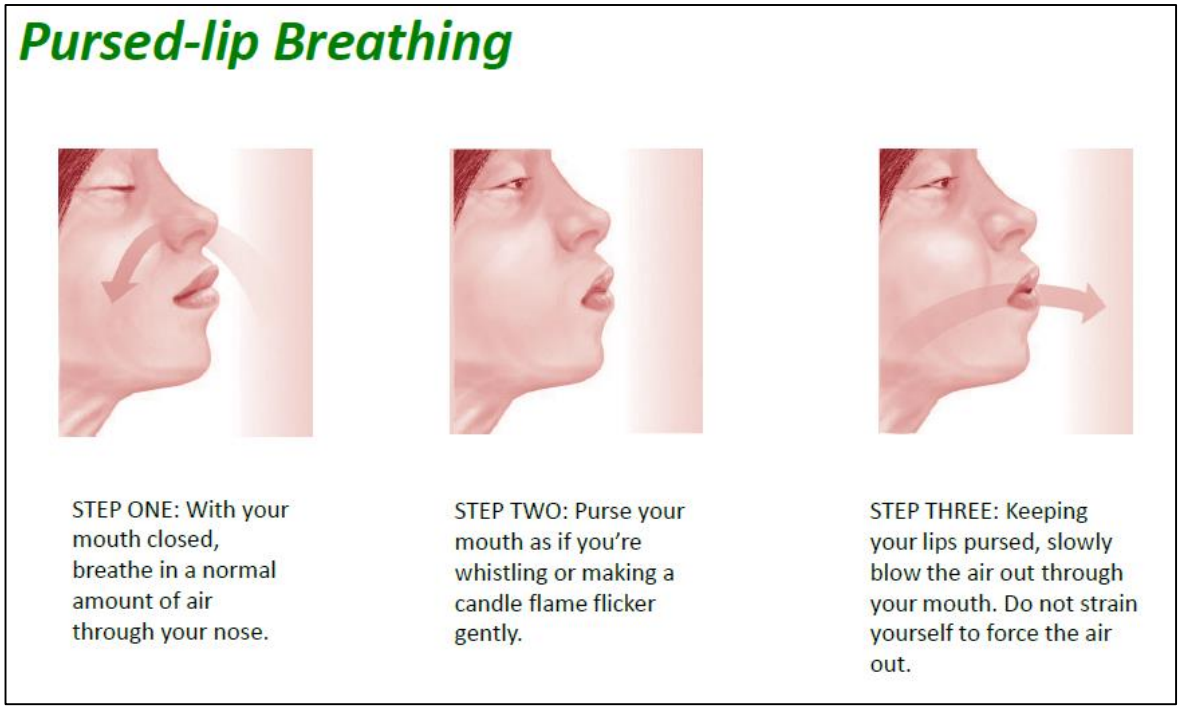
Comprehensive Approach to Management of Refractory Dyspnea in Advanced COPD

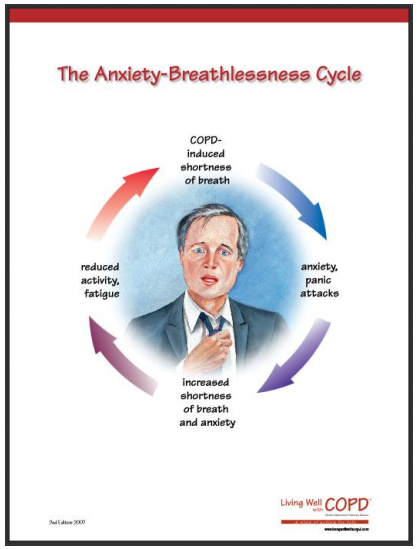


Marciniuk D, Goodridge D, Hernandez P, et al. Can Resp J 2011; 18:69-78.

Pursed Lip Breathing

Pursed Lip Breathing can be an effective strategy for relief of dyspnea for patients with advanced COPD





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D. Marciniuk et al. Managing dyspnea in patients with advanced COPD: A CTS clinical practice guideline CRJ 18-2; March/April 2011 & Breathworks Breathlessness Factsheet The Lung Association - Ontario

Fans help dyspnea!

Airway Clearance Techniques

May be considered in COPD patients with secretion retention:

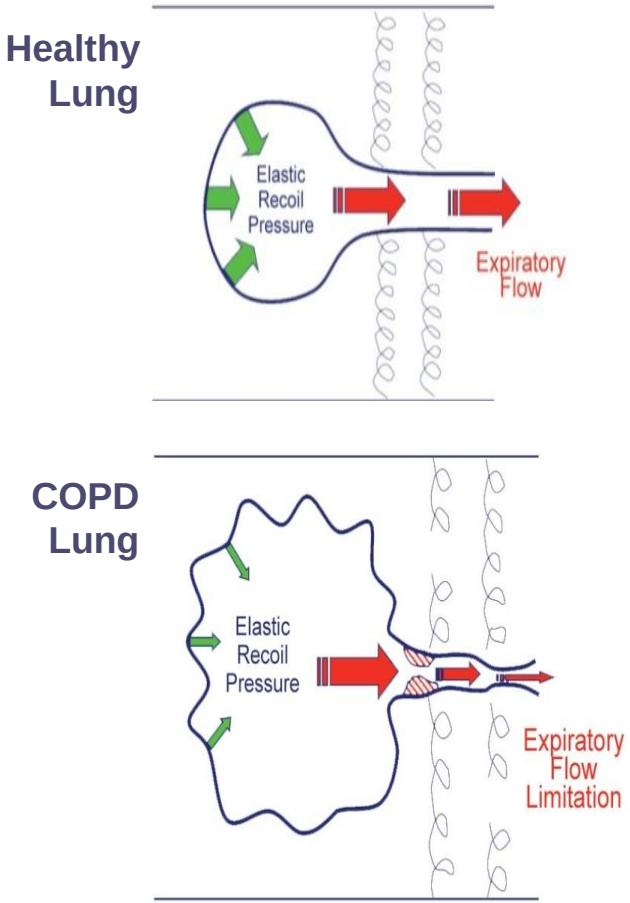
- to decrease obstruction in the airways
- to improve ventilation
- to promote effective breathing pattern

What techniques are available?

- Postural drainage
- Vibration, percussion and other manual techniques
- Forced Expiratory Technique
- Active Cycle of Breathing
- Mechanical devices (Aerobika, Acapella)
- Positive Expiratory Pressure (PEP) therapy
- Oscillating Positive Expiratory Pressure (OPEP)
- High Frequency Chest Wall Oscillation

Why is airway maintenance important in COPD therapy?

- Airway maintenance helps to open the airways, mobilize and clear mucus to improve lung functioning
  - Post exacerbation vs regular
- The goal is to improve airway **structure** and **function**
  - Remove any blockages in the air pathways
  - Help open collapsed or destabilized airways
  - Improve the surface area where gas exchange can occur
  - Reduce the work of breathing
- Clear airways may also improve delivery of aerosol medications[1]



O'Donnell DE, Laveneziana P. Physiology and consequences of lung hyperinflation in COPD. Eur Respir Rev 2006;15(100):61-67.

1. Wolkove N, *et al*. Use of a mucus clearance device enhances the bronchodilator response in patients with stable COPD. CHEST 2002;121(3):702-7.

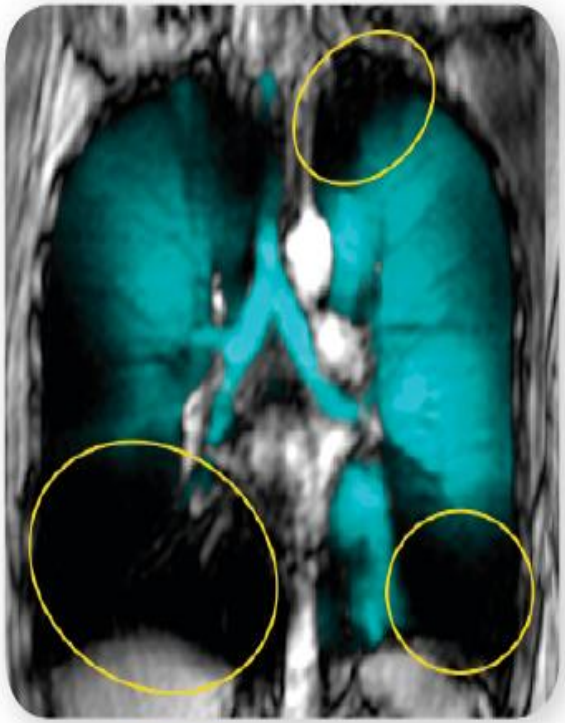
The Aerobika* device: Overview

- The ***Aerobika**** device is an Oscillating Positive Expiratory Pressure Therapy System
- Drug-free, easy-to-use medical device
- No side effects or drug interactions
- The patient exhales through the device which creates a unique oscillation and pressure dynamic within the airways
- The ***Aerobika**** device has been clinically supported and tested

Validated by MRI:
Shown to improve ventilation

Before

Baseline care



After

Baseline care plus *Aerobika** device

Teal colour and intensity show areas with gas distribution. Yellow circles represent areas of greatest change **after 3-4 weeks of *Aerobika**** device use.

Reference: Svenningsen *et al*. *COPD*. 2016;13(1):66-74. MRI=magnetic resonance imaging; ^{3}He = hyperpolarized Helium-3.

Validated by real world evidence: Clinically proven to reduce **exacerbations.**

- The ***Aerobika**** device demonstrated a significant reduction over usual care in the percentage of patients with a moderate-to-severe exacerbation at 30 days

Equates to

NNT

= 14

The *Aerobika device can help prevent**
1 exacerbation
for every
14 patients treated

Reference: Suggett J, ERS 2016 .

Suggested Protocol for Managing Dyspnea with Opioids in Advanced COPD

- Initiate opioid therapy with oral immediate release morphine syrup – titrate slowly at weekly intervals over a 4 to 6 week period.
- Start therapy with morphine 0.5 mg orally twice daily for 2 days, and then increase to 0.5 mg orally every 4 hours while awake for remainder of week 1.
- If tolerated and indicated, increase to morphine 1.0 mg orally every 4 h while awake in week 2, increasing by 1.0 mg/week or 25% dosage increments/week until the lowest effective dose that appropriately relieves dyspnea is achieved.
- Once a stable dosage is achieved (i.e., no significant dose change for 2 weeks and dyspnea controlled), a sustained-release preparation at a comparable daily dose could be considered for substitution.
- If patients experience significant opioid-related side effects such as nausea or confusion, substitution of an equipotent dose of oral hydromorphine could be considered (1 mg hydromorphine = 5 mg morphine).
- Stool softeners and laxatives should be routinely offered to prevent opioid-associated constipation.

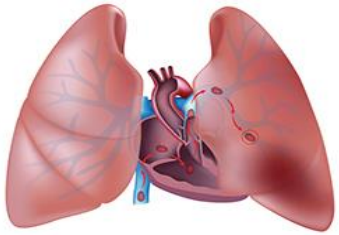
Remember that not all Dyspnea is COPD!

- Could she have a comorbid illness causing it, what could that be?

COPD and Heart Failure

"Common problems, common partners"

- 30% of patients with stable COPD have some degree of HF[1]
- 30% of patients seen in a HF clinic had COPD[2]
- FEV1 impairment is a strong predictor of mortality in HF[3]
- Unrecognized heart failure may mimic or accompany AECOPD



1. *Rutten FH, Eur Heart J 2005;26:1887*
2. *Hawkins NM, Eur J Heart Fail 2009;11:292*
3. *Iversen KK, Eur J Heart Fail 2010;12:685*

Potential Issues with Grace:

- You recognize that she may have developed increasing congestive heart failure which has contributed to her gradual decline.
- Also, she appears to be depressed which is contributing to her feelings of hopelessness. The team, the patient, and her daughter agreed the following plan.
- All comfort and supportive measures but no mechanical ventilation, BiPAP, or cardiopulmonary resuscitation.
- A trial of oxygen therapy and treatment of her heart failure.
- A review with the palliative care team.
- Further meeting in 5 days to review progress.

5 days later...

- Grace significantly improved, she is receiving oxygen 2 L/m at rest and 4 L/m with activity. Her PCO2 is now 45 mmHg. Her ankle edema has resolved with diuretic therapy and a small increase in enalapril.

- Her mood has improved. She is now able to wash and dress herself. She asks to go home, the palliative care team agreed to follow her and coordinate her care with the home care team.

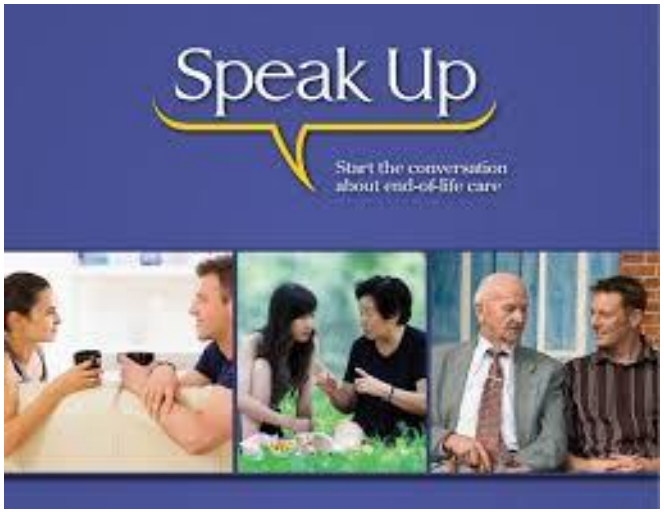
At the follow up family meeting…

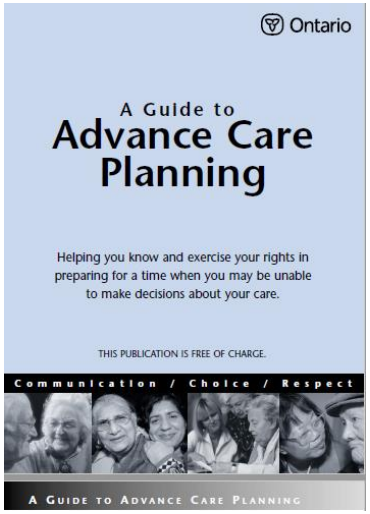
The following care plan is agreed:

1. An advanced directive is drawn up and her daughter is appointed a substitute decision-maker. Her daughter takes 3 month leave of absence from her job in England. The ministry of health form is completed which authorizes the paramedics to give comfort measures but with hold cardiopulmonary resuscitation and intubation.
2. The patient declines an antidepressant.
3. Management of dyspnea was discussed including potential role of small doses of morphine.
4. Her care is more aggressive in the Long Term Care unit doing daily weights, regular O2 measurements and RT??
5. Recognize that prognosis of COPD + CHF is worse than COPD alone!

Advanced Care Planning

- Discussions regarding advanced care planning should be initiated with the patient/family and health care team as early as possible





http://speakupontario.ca/
http://www.advancecareplanning.ca

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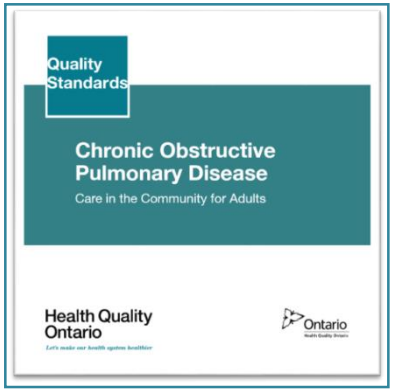
Goals of Care and Individualized Care Planning

Quality Statement #3: "People with COPD discuss their goals of care with their future SDM, their primary care provider, and other members of their interprofessional care team. These discussions inform individualized care planning, which is reviewed and updated regularly."

Quality Statement #13: People with COPD and their caregivers are offered palliative care support to meet their needs.



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Health Quality Ontario: COPD Quality Standards Report 2018

Potential Goals of Care

- Cure of disease
- Avoidance of premature death

Remember that goals of care may change as COPD disease trajectory is unpredictable!

Be prepared to discuss:

- Prognosis
- Patient's values
- Risks and expected outcomes of treatment

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Stone, MJ. Goals of care at the end of life. BUMC Proceedings 2001; 14: 134-137

Difficulties of prognosis

”The variable and prolonged course of COPD patients makes prognostication difficult for both physicians, patients and their caregivers and makes addressing end-of-life goals difficult. A natural history of COPD is heterogeneous”

Casanova C et al. Am J Respir Crit Care Med. 2011

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When should I consider palliative care - a transition point?

- Severity of disease (FEV_1 less than 30% pred)
- Oxygen dependence
- One or more hospital admissions (exacerbations)
- Poor nutritional status
- Decreased functional status
- Increasing dependence on others
- Age over 70 years
- Lack of additional treatment options

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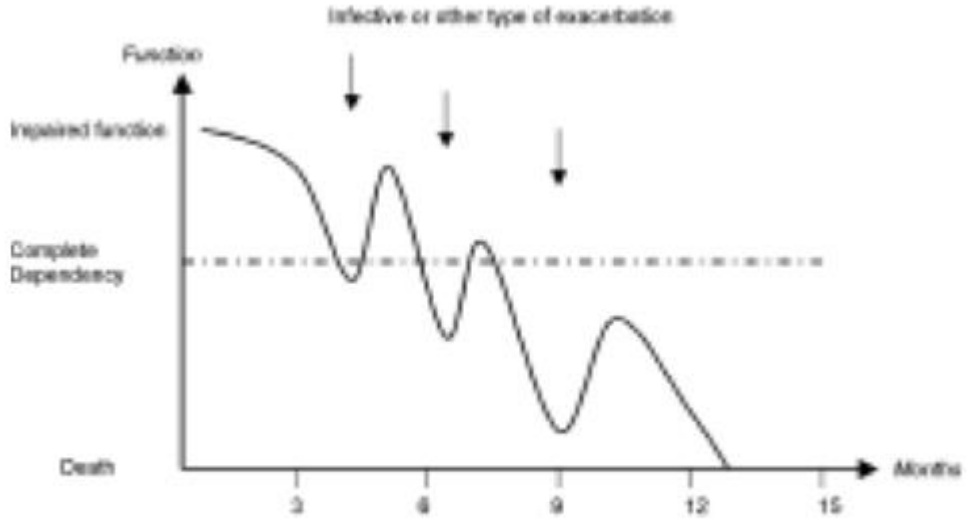
Patel K et al. Respirology 2012

Disease trajectory



Typical end of life disease trajectory in COPD & CHF

Lehman R. How long can I go on like this? Dying from cardiorespiratory disease, British Journal of General Practice 54(509):892-3 · January 2005

Advanced Care Planning:

- Address worsening symptoms (dyspnea) and decline in health status:
  - Nutritional support
  - Psychosocial: Depression/Anxiety
  - Insomnia/Fatigue
  - Advanced Directive
  - Need for palliative and hospice care

Table 3.9. Palliative care, end of life and hospice care in COPD

- Opiates, neuromuscular electrical stimulation (NMES), oxygen and fans blowing air onto the face can relieve breathlessness **(Evidence C)**.
- In malnourished patients, nutritional supplementation may improve respiratory muscle strength and overall health status **(Evidence B)**.
- Fatigue can be improved by self-management education, pulmonary rehabilitation, nutritional support and mind-body interventions **(Evidence B)**.

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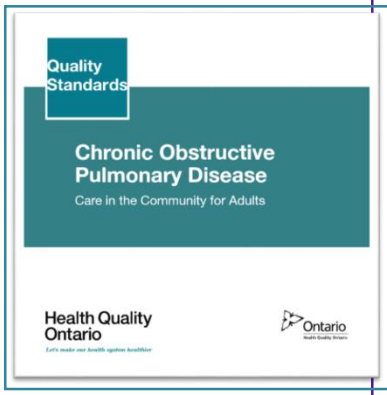

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Health Quality Ontario: COPD Quality Standards Report 2018

End of Life Care Discussion

HCPs should be encouraged to identify patients with COPD for whom end-of-life care discussions are especially important:

- FEV_1 < 30% predicted
- ...gen dependence
- ...hospital admissions in the previous ... COPD
- Left heart failure or ...idities
- Weight loss or cachexia
- Decreased functional status
- Increasing dependence on others
- Age > 70yrs

When to have this?
"Would you be surprised if this person was to die in the next few months?

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Curtis, J.R., Palliative and end-of-life care for patients with severe COPD. Eur Respir J 2008:32:796-803

Palliative Care

Regardless of disease stage initiate palliative care to:

- Enhance quality of life
- Optimize function (symptom control)
- Assist with end of life decision making
- Provide emotional and spiritual support for patients and their families and caregivers

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Palliative Care Language

Instead of :

- Do you want us to do everything possible?
- Will you agree to discontinue care?
- I am going to make it so he won't suffer.
- It's time we talk about pulling back.
- I think we should stop aggressive therapy.

Consider using:

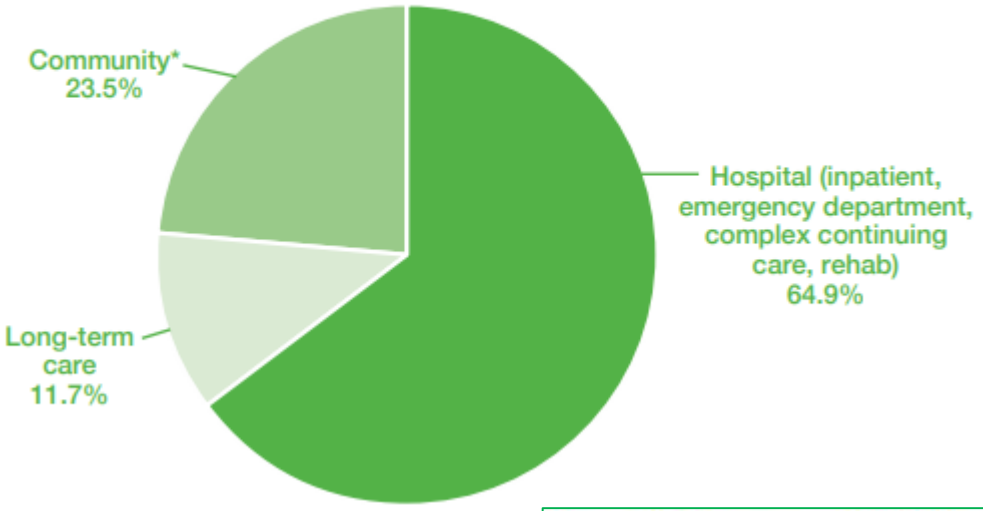
- I'm going to give the best care possible until the day you die.
- We will concentrate on improving the quality of your mother's life.
- We want to help you live meaningfully in the time you have left.

- I'll do everything I can to help you maintain your independence.
- I want to ensure that your father receives the kind of treatment he wants.
- Your mother's comfort and dignity will be my top priority.
- I will focus my efforts on treating your symptoms.
- Let's discuss what we can do to fulfill your wish to stay at home.

Adopted from Stone, MJ. Goals of care at the end of life. BUMC Proceedings 2001; 14: 134-137

Palliative Care in Ontario

Percentage of palliative care patient deaths, by location, in Ontario, 2014/15



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Health Quality Ontario Palliative Care Report 2016 www.hqontario.ca

What Are the Next Steps?

- Grace is discharged back to the nursing home uneventfully.
- However, she gradually deteriorates over the next 6 weeks.
- On the advice of the palliative care team and after discussion with her primary care team she is started on morphine 0.5 mg BID which was gradually increased to QID to relieve her dyspnea.
- She dies peacefully in her nursing home.

Advanced Care Paramedic Medical Directive

- Important, but seldom discussed part of individualized planning
- Empowers the paramedics to provide comfort measures only
- Practical measure to ensure patients understand that they can access help from paramedics in an acute crisis without being resuscitated or placed on ventilators.
- Potentially could be used as a portal of entry to a discussion of end-of-life care.

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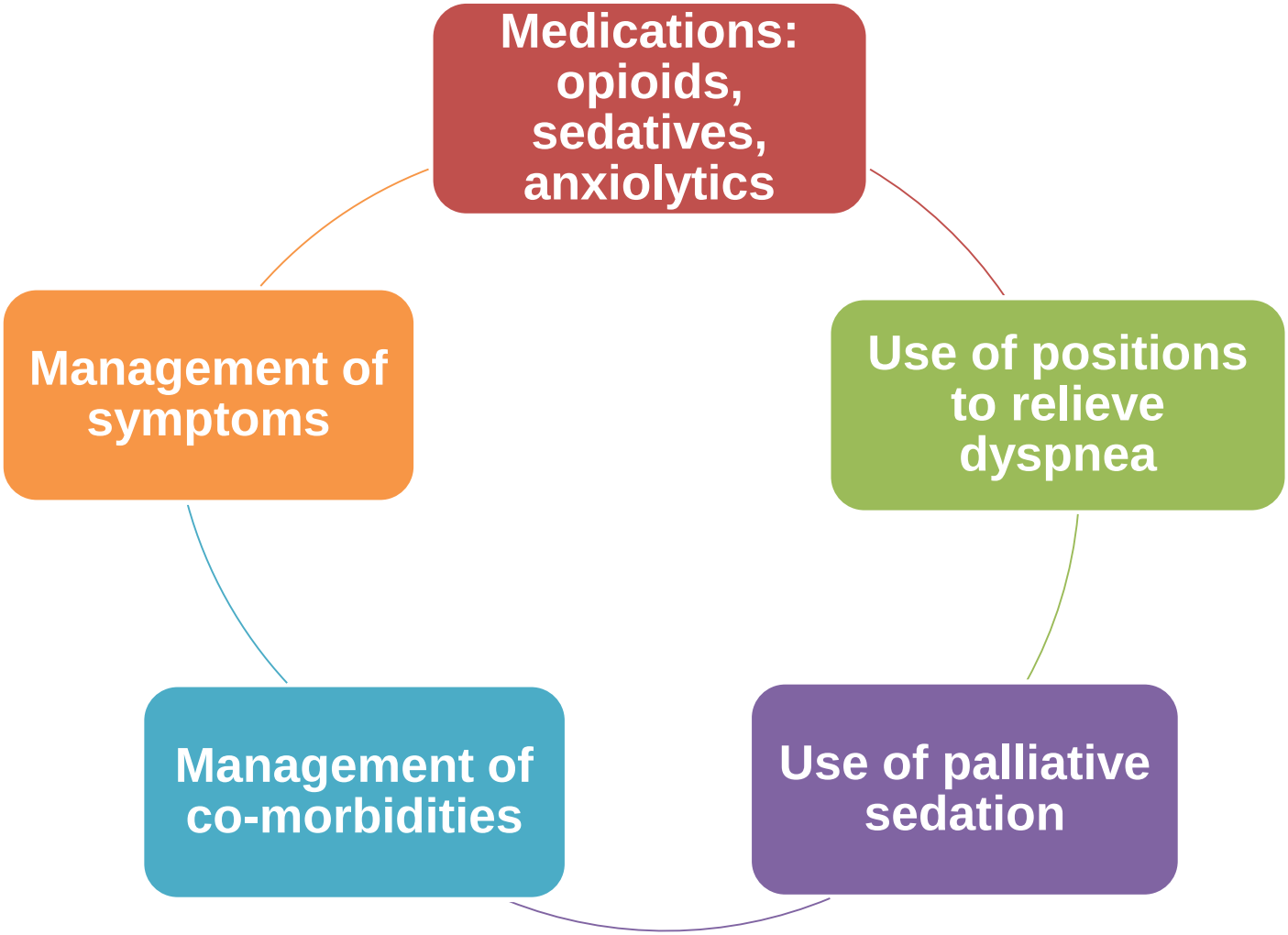
Strategies to Relieve Dyspnea in Advanced COPD



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Opioid use in patients with moderate to severe pain or dyspnea

Starting dosages

Agent	IV	Oral
Oxycodone	N/A	5-10 mg
Methadone	2.5-10 mg	5-10 mg
Morphine	2-10 mg	5-10 mg
Hydromorphone	0.3-1.5 mg	2-4 mg
Fentanyl	50-100 µg	N/A

IV=intravenous; N/A=not available

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

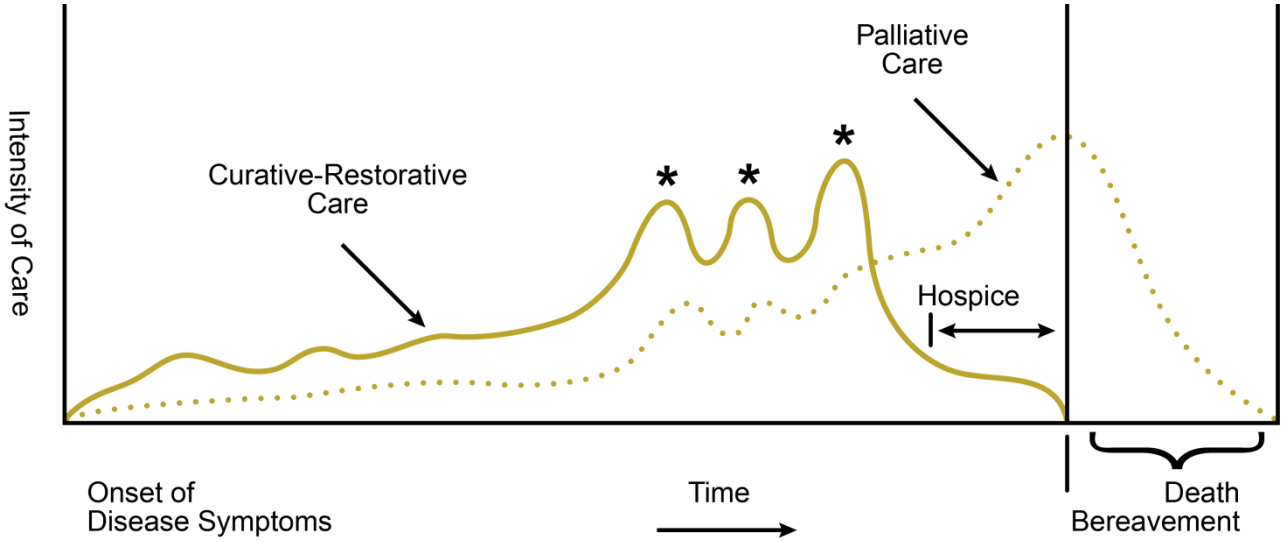
Goals of palliative care

- Achieve the best possible quality of life for patients for as long as they are alive
- Support the patient's family while the patient is alive and after death

Palliative care is about life, not death

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Timing for palliative care: Individualized integrated model of palliative care



- Patient receives palliative care at onset of symptoms and concurrently with curative/restorative care in an individualized manner
- Intensity of palliative care increases and decreases with the needs of the patient and the patient's family

* Periods of high intensity of curative/restorative care (e.g., hospitalizations for lower respiratory tract infections).

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Pain management

- Pain should be assessed using a **functional scale**
- **Mild pa**in should be treated with acetaminophen and NSAIDs. Opioids are the first line of treatment for severe pain regardless of cause
- **Neuropathic pain** may be difficult to treat with opioids alone and may require adjunctive agents, including antidepressants, anticonvulsants, corticosteroids, local anesthetics, etc.
- **Barriers to successful pain management** include failure to assess and treat using a functional scale; and misinformation and concerns of the patient, family and healthcare provider about addiction and tolerance

NSAIDs = Non-steroidal Anti-inflammatory Drugs

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Management of psychological distress and suffering

- Psychological distress is common in patients with advanced respiratory diseases.
- At higher risk for depression, anxiety, and panic attacks.
- Treatment approaches include counseling with or without pharmacotherapy.
- End-of-life preferences should be reevaluated after the patient has had sufficient time to respond to treatment for depression.

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Management of psychological distress and suffering (cont'd)

- Agitated delirium may occur when death is imminent or during hospitalization in ICU settings.
- Manage with haloperidol when rapid relief is important.
- Combination therapy (e.g., oral haloperidol or a second-generation neuroleptic agent with a benzodiazepine) may be needed for long-term therapy for patients with prolonged agitation.
- Minimize environmental stimuli, such as excessive noise, day-night reversal, and disorientation.
  - Earplugs, eye covers, decreasing the volume of alarms, elimination of overhead paging, frequent orienting cues, easy access to family, personal music choices through headphones, and low lights at night.

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Withdrawal of mechanical ventilation

- Terminal extubation (removal of the endotracheal tube) and terminal weaning (gradual reduction of inspired oxygen concentration and/or mandatory ventilator rate).
- Regularly assess for signs of dyspnea and pain after removal from assisted breathing.
- Continue to titrate opioids and benzodiazepines to control discomfort.
- Antibiotics and other life-prolonging treatments, particularly intravenous fluids that can cause respiratory congestion and gurgling, are usually discontinued before ventilator withdrawal.

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

Palliative sedation

- Relief of intractable pain, dyspnea, delirium, cough or existential distress by the use of medications that intentionally cause sedation in a patient who is otherwise close to death.
- **Benzodiazepines or barbiturates** are commonly used – titrated to the patient's comfort.
- **Palliative sedation** does not preclude the use of artificial nutrition and hydration, but often occurs without them. Discuss with the patient or surrogate and patient's family to be sure that they give informed consent and that the family understands what is being considered. The intent is to relieve intolerable suffering.

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

The death rattle and agonal breathing

- Approximately 1/4 of dying patients have noisy breathing, termed “the death rattle”, which may disturb the family
- Terminal weaning helps avoid noisy breathing due to airway secretions
- If a death rattle results from bronchial secretions, elimination of IV fluids and treatment with anticholinergic agents may be effective
- Noisy breathing due to intrinsic lung pathology usually resists therapy

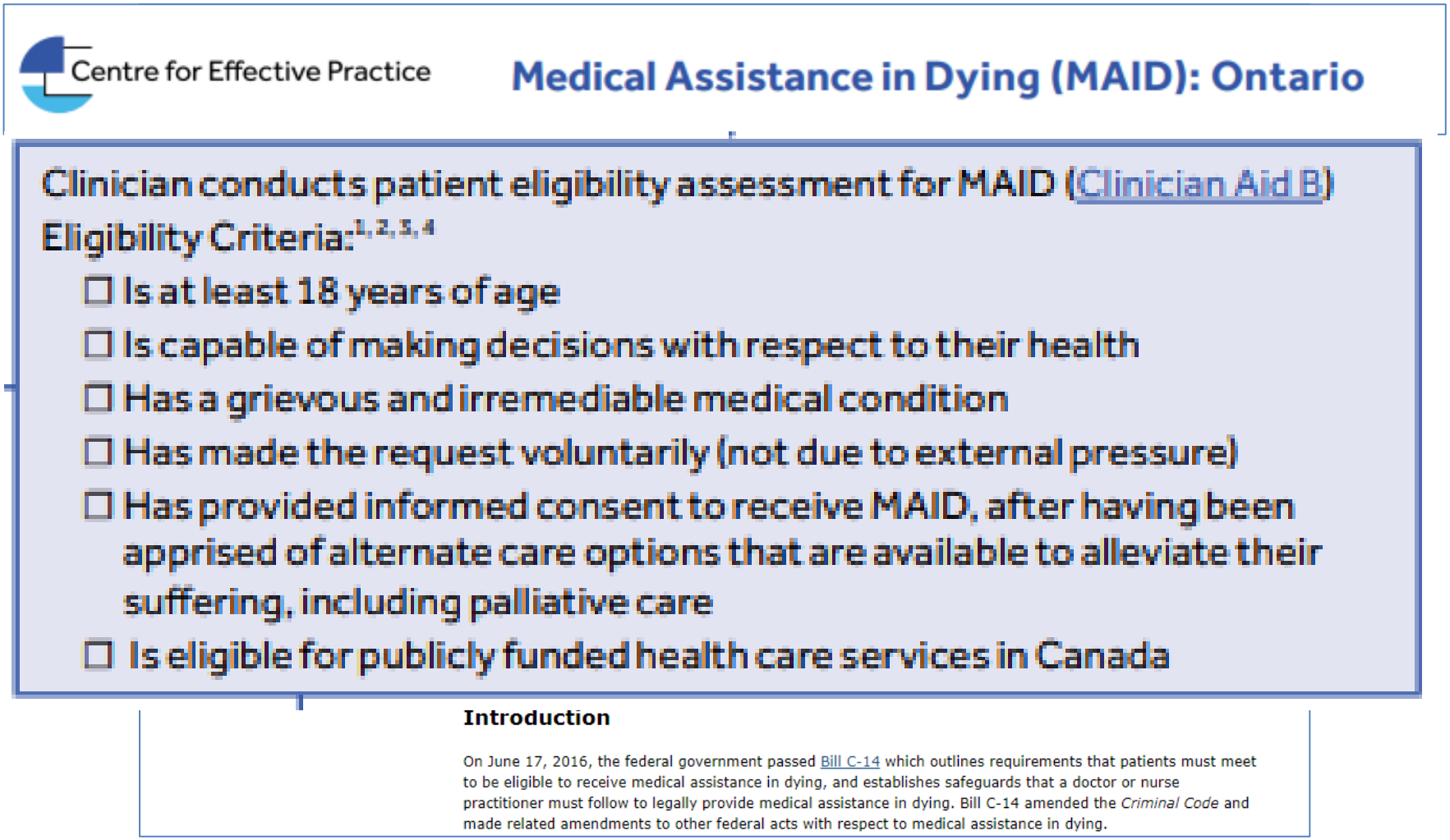
Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

The death rattle and agonal breathing

- In the minutes before death, patients may exhibit “agonal breathing”, which is slow, irregular and noisy breathing that mimics grunting, hiccupping or gasping
- Families should be informed that agonal breathing is part of the dying process, not a sign of patient discomfort
- A death rattle and agonal breathing are not indications for increasing the dose of opioid administered

Lanken PN, et al. Am J Respir Crit Care Med 2008;177:912-27. Symptom management in (advanced) IPF and COPD

What about MAiD?



Centre for Effective Practice

Medical Assistance in Dying (MAID): Ontario

Clinician conducts patient eligibility assessment for MAID (Clinician Aid B)

Eligibility Criteria:[1,2,3,4]

- ☐ Is at least 18 years of age
- ☐ Is capable of making decisions with respect to their health
- ☐ Has a grievous and irremediable medical condition
- ☐ Has made the request voluntarily (not due to external pressure)
- ☐ Has provided informed consent to receive MAID, after having been apprised of alternate care options that are available to alleviate their suffering, including palliative care
- ☐ Is eligible for publicly funded health care services in Canada

Introduction

On June 17, 2016, the federal government passed Bill C-14 which outlines requirements that patients must meet to be eligible to receive medical assistance in dying, and establishes safeguards that a doctor or nurse practitioner must follow to legally provide medical assistance in dying. Bill C-14 amended the *Criminal Code* and made related amendments to other federal acts with respect to medical assistance in dying.

Key Messages

- In many patients, the disease trajectory in COPD is marked by a gradual decline in health status and increasing symptoms, punctuated by acute exacerbations that are associated with an increased risk of dying[1]
- Frequency and severity of exacerbations can be reduced[2]
- Patients should be encouraged to ask about their disease, prognosis and possible circumstances of their death.[2]
- Health care providers need to learn necessary skills to conduct end of life discussions with their patients at increased risk of dying.[2]

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O'Donnell, DE, et al. CTS recommendations for management of COPD - 2008 update – highlights for primary care. Can Respir J Vol. 15 Suppl A Jan/Feb 2008

Provider Education Program Resources

E-Modules: ola.machealth.ca

- Spirometry: A Clinical Primer
- Spirometry Interpretation
- Asthma Action Plans

Workshops available:

- Adult and Pediatric Asthma
- COPD vs. Asthma
- Preschool Asthma
- COPD
- Spirometry Interpretation
- Asthma Action Plans

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