CME Diagnosis and Treatment of Chronic Obstructive Pulmonary Disease in Older Adults

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With the population progressively aging, the geriatric aspects of COPD deserve special consideration. Older adults with respiratory symptoms and a current or previous history of smoking should be considered for a diagnosis of COPD. Objective demonstration of airflow obstruction is mandatory for the diagnosis of COPD. The majority of older people can adequately perform spirometry for an objective demonstration of airflow obstruction. Nonpharmacological treatment includes smoking cessation, vaccination, self-management education and communication with a case manager, and pulmonary rehabilitation. Bronchodilators are the most important agents in the pharmacotherapy of COPD. Inhaled corticosteroids are indicated for patients with recurrent exacerbations who are already on optimal bronchodilator therapy.

Key words: *chronic obstructive pulmonary disease, older adults, diagnosis, spirometry, management*

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Introduction

Chronic obstructive pulmonary disease (COPD) includes obstructive chronic bronchitis and emphysema that are present to varying degrees in the same patient. Neither airflow obstruction associated with diffuse bronchiectasis or asthma is common in COPD cases. COPD often occurs in adults over 40 years of age. The disease is largely caused by smoking and is characterized by a progressive and somewhat irreversible airflow obstruction. The clinical course of COPD is one of gradual impairment, with exercise dyspnea and episodes of acute exacerbations that contribute to the deterioration of patients' health status and the burden on the health care system.[1,2]

COPD is one of the most common causes of ill health, disability, and mortality affecting adults around the world.[3] The prevalence of COPD increases with age for both men and women.[4] Mortality rates increase rapidly over the age of 75,[4] and COPD mortality in general is almost certainly underestimated.[5] The increasing proportion of people aged over 65 will produce an increased number of deaths and, by proxy, an increased incidence of COPD. Furthermore, COPD is expected to become the fifth leading cause of premature death and disability in the coming decade behind ischemic heart disease, depression, accidents, and stroke.[3] In addition to the major impact on the patient's health status, COPD patients will often experience decline in personal independence and require a wide variety of care and services.

Consequent to the change in demographics in a progressively aging population, the geriatric aspects of COPD deserve special consideration. The aims of the present review are to provide recommendations for the diagnosis and management of COPD that is better adapted to the needs of older patients, and to highlight potential care gaps. This review will be presented in the context of the Canadian Consensus Guidelines for the management of COPD.[6]

Making the Diagnosis of COPD

COPD deserves special consideration because it is often unsuspected and underdiagnosed.[7,8] A timely and accurate diagnosis of COPD in older persons should result in better management and improve health-related quality of life. Aging persons with a current or previous history of smoking should be considered for a diagnosis of COPD, especially those with productive cough, progressive shortness of breath and exercise limitation, and / or frequent respiratory infections. However, objective demonstration of airflow obstruction is mandatory for the diagnosis of COPD. Assessment of airflow obstruction may be even more important in older adults than in the general population, considering the high prevalence of comorbid conditions with similar symptoms that tend to confound the diagnosis in this age group.

Criteria have been set in the recent Canadian Consensus Guidelines[6] in an attempt to simplify the diagnosis. A post-bronchodilator FEV1 of less than 80% of the predicted value, associated with a FEV1 / FVC ratio of less than 0.70, define airflow obstruction, and both are necessary for the diagnosis of COPD. However, old age is considered by many professionals to be a limiting factor in spirometric performance. Recent studies[9,10] have shown that the majority of older adults can perform spirometry according to international guidelines,

and less than one-fifth of all study participants were unable to perform spirometry adequately . Cognitive and functional impairments, as well as lower education level, were found to be independent risk factors for a poorer spirometry performance.[9] Male sex and age were risk factors for a poorer reproducibility of FEV1, although it tended to improve with repetition of maneuvers.[9] This study reinforces the need for adequate supervision of spirometric tests in the older population. There is also a need to provide instructions that are readily understood by patients with sensory and cognitive limitations, and allow repetition of maneuvers after a suitable rest interval.

One recent concern has been the risk of over diagnosis of COPD using a fixed cut-off point for defining COPD; the use of simple criteria could come at the expense of misclassification. Making use of the major determinants of lung function such as sex, age, and height could help us achieve more accuracy but at the cost of simplicity. Previous studies in older patients have shown that the lower limit of normal for FEV1 is less than 80% and FEV1/FVC is less than 0.70.[11,12] More accurate, age-specific diagnostic limits for FEV1/FVC have been proposed[11] and they are presented in Table 1.

Table 1: Spirometry Criteria for Diagnosis of COPD

Parameter	Age	Limit value
FEV1	All age	<80% predicted normal value
FEV1/FVC*	<70 years old	<0.70
	70–80 years old	<0.65
	>80 years old	<0.60

*Hardie *et al.*, 2002[11]

Managing COPD

The approach of care for COPD needs to adequately address the numerous problems brought on by a chronic illness and other issues more specific to the needs of older patients. The goals of treatment include prevention of disease progression, limiting or preventing a medical crisis, and managing any crisis that occurs in order to control symptoms and overcome disability, social isolation, and economic issues. The ultimate goal is to improve health-related quality of life. Care that is better adapted to the needs of chronic disease will also reduce the use of health services, such as emergency department visits and hospitalizations. Recently, the COPD/Rehabilitation Committee of the Canadian Thoracic Society has published best practice recommendations based on a thorough review of the literature.[6] Table 2 presents an overview of the evidence-based recommendations with respect to specific goals of treatment.

Smoking Cessation

The cessation of smoking produces, at best, only minor improvement in FEV1. However, it remains the only proven therapy to slow the accelerated decline in lung function related to COPD.[13,14]

Vaccination

Annual influenza vaccination is strongly recommended for COPD patients as it reduces morbidity, mortality, and hospitalizations.[15] The benefit of the pneumococcal vaccine is not as well established in COPD. However, it is recommended by most to be given once in the patient's lifetime.

Pharmacological Therapy

Since none of the available pharmacotherapy has been shown to change the natural history of the disease, the management strategy in COPD is aimed primarily at improving symptoms and quality of life. This is an important objective, which is best assessed by carefully interviewing the patient to ascertain the severity of symptoms such as dyspnea and exercise tolerance.

Bronchodilators are the most important agents in the pharmacotherapy of COPD. Short-acting β2-agonists and anticholinergic agents are often used together, although improvement is not always predictable. A significant body of evidence supports the use of long-acting bronchodilators[16] in moderate-to-severe COPD. Long-acting β2-agonists (LABA) have been shown to achieve longer and more predictable improvement in lung function. Studies have also consistently demonstrated that LABA improve health-related quality of life. Similarly, studies with long-acting anticholinergic agents demonstrate improved patients' quality of life compared with either placebo or short-acting anticholinergic agents.[16] In some studies, both LABA and long-acting anticholinergic agents have a synergistic effect in reducing exacerbations rates. Despite the strong evidence of the benefit of long-acting bronchodilators, it is relatively common to find patients with moderate-to-severe COPD who are undertreated. Patients of any age who remain symptomatic and are limited in their activities of daily living should have at least one trial with long-acting bronchodilators. If you ask the patient, she/he will best judge if the new bronchodilator treatment has improved his/her breathlessness, disability, and quality of life.

Table 3 presents the stepwise approach in the management of COPD according to dyspnea intensity and disability. Overuse and improper use of bronchodilators are important issues for any group of patients but especially in older adults. Patients with severe COPD who experience shortness of breath during exercise may make excessive use of their short-acting bronchodilators. It is important to ensure that the patient is on optimal maintenance bronchodilator agents, that he or she implements the suitable breathing

Table 2: Managing COPD Based on Specific Goals of Treatment

Goal of Treatment	Therapy
Reduce lung function decline	Smoking cessation[13,14]
Reduce mortality	Smoking cessation,[34] influenza vaccination,[15] and long-term oxygen treatment[32,33 *]
Reduce hospital admission	ICS, LABA, and LAAC[16]
	Influenza vaccination[15]
	Pulmonary rehabilitation[35] and self-management education with early exacerbation treatment[24,29]
Reduce exacerbation	ICS,[19] LABA,[16] LAAC,[16] and combination LABA- ICS[20–23]
Improve FEV1	SABD; LABA; LAAC; ICS†[16]
	Combination LABA-ICS[20–23]
Improve dyspnea, exercise capacity	SABD; LABA,[16] LAAC[16]
	Combination LABA-ICS[20–23]‡
	Pulmonary rehabilitation[24]
Improve health-related quality of life	LABA,[16] LAAC[16]
	Combination LABA-ICS‡[20–23]
	Pulmonary rehabilitation[24] and self-management education[§29]

*COPD patients with chronic hypoxemia
† The clinical significance of the early improvement in FEV1 with ICS remains unknown
‡ The combination has been shown to be beneficial as compared to placebo; the evidence that it is more beneficial than the LABA component alone is lacking.
§ Exercise need to be part of these programs to achieve benefit on specific domains of quality of life such as symptoms and physical activity improvement.
ICS: inhaled corticosteroids; LABA: long-acting β2-agonist; LAAC: long-acting anticholinergic; SABD: short-acting bronchodilator

technique, and also paces the level of activity appropriately. However, improper use of the inhalers is common in the older population and it can result in suboptimal level of drug delivery.[17,18] Special attention should be given to teaching patients the correct use of the inhaler devices.

Inhaled corticosteroids are used widely despite much weaker evidence for their benefits in COPD than for treating asthma. They have been shown to be of benefit in reducing exacerbation rates, particularly in patients with severe COPD (FEV1 less than 50% of predicted normal value).[19] Trying to prevent acute exacerbation should be an important consideration in managing COPD. The use of inhaled corticosteroids should be prescribed in patients with recurrent exacerbations who are already on optimal bronchodilator therapy (see Table 3).

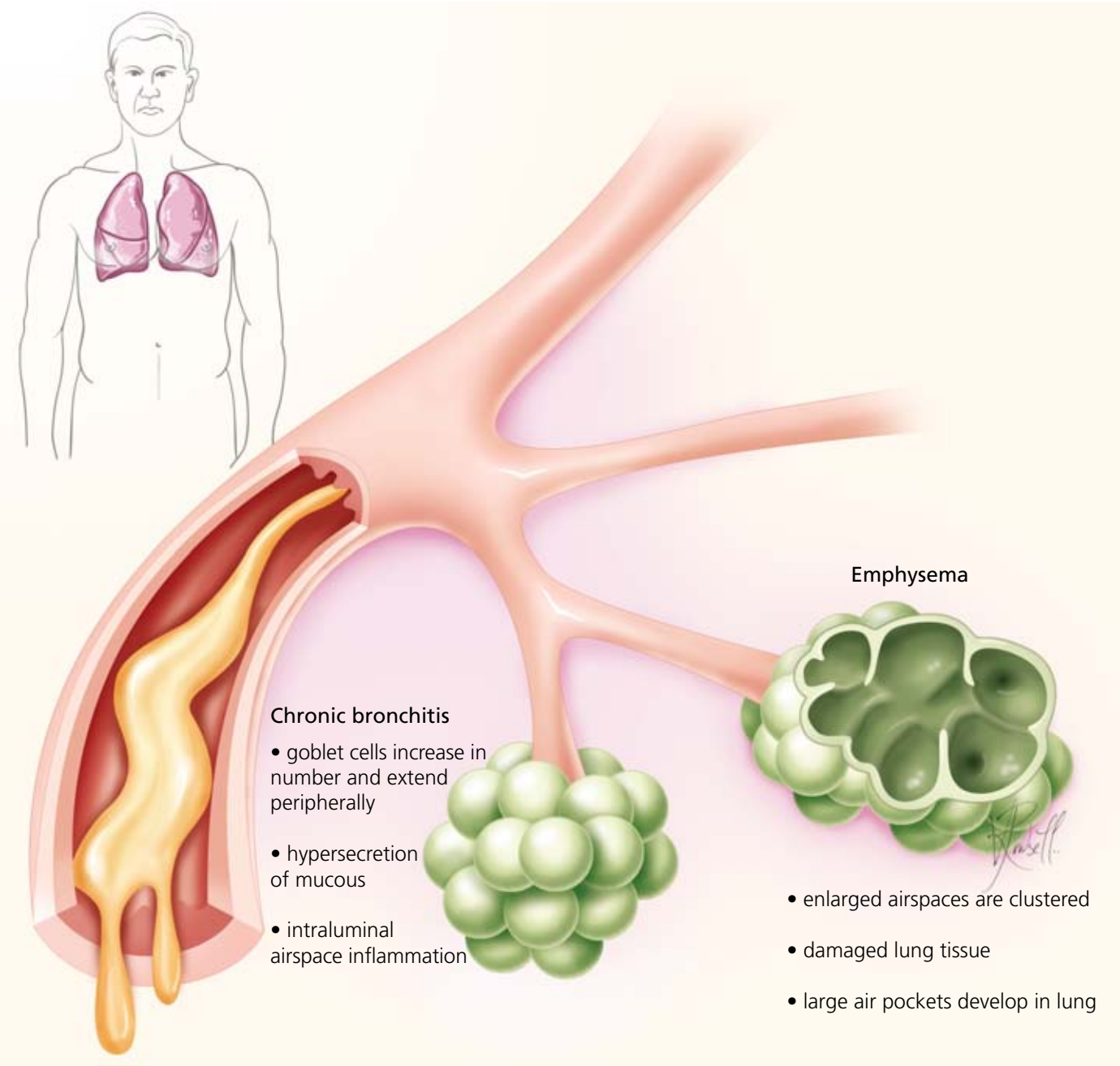
Although combination therapy (inhaled corticosteroids and LABA) has been shown to be beneficial as compared to placebo, the evidence that it is more beneficial than the LABA or the inhaled corticosteroids components alone is lacking. The clinical significance of the improvements seen in FEV1 over the LABA component used alone remains to be established.[20–23] Combination therapy could be considered and tried in patient who exhibit persistent incapacity related to dyspnea despite optimal bronchodilator therapy (see Table 3).

Nonpharmacologic Therapy

With chronic disease such as COPD, the responsibility of day-to-day care falls most heavily on patients and their families. Pulmonary rehabilitation has been shown to be beneficial in improving dyspnea, exercise tolerance, and health-related quality of life.[24] Although global function remained lower in older patients after having completed a pulmonary rehabilitation program, it has been demonstrated that outcomes improve regardless of age.[25]

With COPD, one needs to cope not only with symptoms but also with the multiple psychological and social problems that occur as a result. While depression is not easy to recognize in older adults with COPD, it is common and is associated with increased morbidity, physical limitation, and reduced quality of life.[26] Cognitive behaviour therapy is effective in reducing anxiety and depression in COPD patients.[27,28]

Figure 1: Physiology of Chronic Obstructive Pulmonary Disease



There is new evidence from a recent study[29] that self-management education can reduce hospitalizations and emergency visits. The impact of an education program not coupled with a supervised exercise program was limited to improvements in the dimensions of health status, such as disease control and social functioning. However, through education and communication with a case manager, it has been suggested that we can improve a patient's ability to adopt a healthier lifestyle, improve the use of medication, recognize the onset of exacerbation, and initiate early treatment at home.[30] In order to be beneficial, self-management programs may need to primarily target COPD patients with impaired health and frequent exacerbations, including patients with a large range of airway obstruction.[31]

Long-Term Oxygen Therapy

In clinically stable patients with COPD, current evidence supports the administration of home oxygen more than 15 hours per day in those with hypoxemia of PaO2 less than 55 mmHg or between 55 and 60 mmHg in the presence of cor pulmonale, right heart failure, or erythrocytosis.[32,33] Clinical management of transient sleep desaturation (SaO2 less than 88% for more than a third of the night) often includes nocturnal oxygen therapy, although clinical benefits have not been demonstrated in a clinical trial.

Table 3: Stepwise Approach to Treating COPD According to Dyspnea Intensity and Disability

Disease severity	Mild	Moderate	Moderate-to-severe	Severe
MRC dyspnea scale	**2**	**3**	**4**	**5**
Disability	Dyspnea hurrying or walking up a slight hill	Dyspnea while walking at own pace level ground	Dyspnea causing the patient to stop after walking 100m or for a few minutes	Dyspnea when dressing or too breathless to leave the house
Treatment Approach				
Nonpharmacological	Smoking cessation			
	Vaccination Annual flu vaccine and pneumococcal vaccination once in lifetime			
	Self-management education with case manager Effective inhaler technique, strategies to alleviate dyspnea, active lifestyle and exercise, and action plan with decision making regarding acute exacerbation			
	Pulmonary rehabilitation Referral for those with restriction in their activities despite pharmacotherapy			
Pharmacological*	SABD Regular or PRN	Combined SABA & SAAC regular and PRN If limited response, add or replace with LABD† ± ICS (if recurrent exacerbations)	LABD (LABA or LAAC)‡ and SABA PRN If limited response, try a combination of LABA and LAAC§ ±Theophylline ± ICS (if persistent dyspnea with ADL or recurrent exacerbations)	

SABD: short-acting bronchodilator; SABA: short-acting β2 agonist; SAAC: short acting anticholinergic; LABD: long-acting bronchodilator; LABA: long-acting β2 agonist; LAAC: long-acting anticholinergic; ICS: inhaled corticosteroids; ADL: activities of daily living; * Treatment should target an improvement of the patient's dyspnea and disability. Careful assessment of dyspnea specific to the patient's experience might be more sensitive than the MRC dyspnea scale to identify minimal improvement in a given individual; †LABD should be tried if the patient remains breathlessness and limited in his or her activities; ‡ Although LABD (LABA and LAAC) have been shown to be superior to SABD, some patients will report more symptoms relieved using SABD or combined SABA & SAAC than either of the LABD; §Combined LABA and LAAC are recommended in severe symptomatic COPD although the superiority of the combination on either of the component alone remains to be shown.

Prescription of ambulatory oxygen is recommended for patients with normoxemia at rest, but transient exercise desaturation should be limited to patients with symptom improvement, specifically dyspnea and exercise performance.

End-of-Life Care

Accurate predictions for individual patients with COPD are difficult to make. End-of-life discussions should not be limited to when the patient is admitted to an intensive care unit but should be initiated in the primary care setting. Pulmonary rehabilitation programs may also be a suitable venue for end-of-life discussion. Links with palliative care programs can also be established when it is possible. However, many patients with advanced disease are still amenable to pulmonary rehabilitation that could result in alleviation of symptoms such as dyspnea, and improve quality of life and autonomy. In the continuum of care, patients are best served if they are better informed and confident that you will be with them until the end.

Summary

Family physicians have a primary role in the diagnosis and management of COPD. However, physicians have to increase their current level of suspicion of a diagnosis of COPD and ensure that the diagnosis is confirmed by a spirometry. Spirometry performance is acceptable in the majority of older patients unless the patient has a cognitive disorder.

The pessimistic view of therapeutic futility, held by both the patient and the health professional, is not conducive to a positive outcome, and a shift in thinking is called for. The general late presentation of COPD in older patients should favour simultaneous consideration of all treatment modalities, both pharmacological and nonpharmacological. Smoking cessation is of great importance as it is the only proven treatment to prevent disease progression. Pharmacologic treatment, especially long-acting bronchodilators and pulmonary rehabilitation with an exercise program, are the most effective modalities to improve patients' symptoms of dyspnea, exercise tolerance, and health status. Vaccination, long-acting bronchodilators, and inhaled corticosteroids are

beneficial to prevent acute exacerbation or respiratory complications. Self-management education conducted by a trained health professional has begun to show promise in improving patients' health status and reducing the burden on health care. A continuum of self-management education should be coupled with a supervised exercise program as well as other effective modalities of therapy, and integrated into standard practice. Importantly, physicians need to be proactive in addressing end-of-life care in patients with severe COPD.

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