

GUIDELINES & PROTOCOLS

ADVISORY COMMITTEE

Chronic Obstructive Pulmonary Disease (COPD)

Effective Date: January 1, 2005

Scope:

The guideline provides strategies for the improved diagnosis and management of adults with chronic bronchitis and emphysema (chronic obstructive pulmonary disease).

COPD is a respiratory disorder most commonly caused by smoking. COPD involves progressive airway obstruction with breathlessness, cough and sputum production and increasing frequency and severity of exacerbations.

STANDARD OF CARE

Accurate diagnosis
Smoking cessation
Education and self-management
Structured exercise and pulmonary rehabilitation
Immunization
Optimal maintenance therapy
Special attention to exacerbations
End of Life Care
Clinical review at least twice a year

CARE SUMMARY

A. Diagnosis: COPD is underdiagnosed

RECOMMENDATION 1 Diagnosis by spirometry (FEV_1 less than 80% and $FEV_1/FVC^* < 0.7$ postbronchodilator)

Spirometry testing for patients at high risk should include:

- Smokers or ex-smokers 40 years or older;
- Patients with persistent cough or sputum production;
- Patients with frequent respiratory infections;
- Patients with unexplained shortness of breath; and
- Chest X-ray may suggest COPD or be used to rule out other diagnoses, but definitive diagnosis requires spirometry.

Note: COPD and asthma commonly coexist

- Asthmatic patients will have a 12% or greater improvement in FEV_1 (and >180 ml in adults from the baseline 15 minutes after use of an inhaled short-acting β_2 -agonist.
- In some situations a corticosteroid trial may be appropriate to differentiate COPD from asthma.

If clinical uncertainty remains, refer to a specialist.

* FEV_1 : Forced expiratory volume in 1 sec., FVC: forced vital capacity

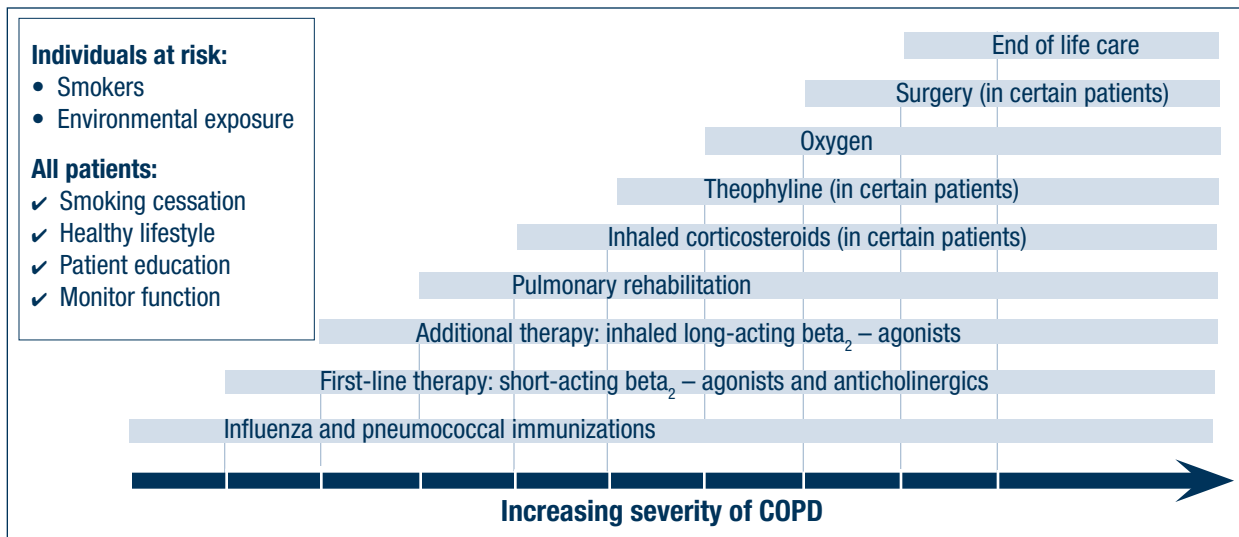
B. Management of COPD

A management strategy including pharmacotherapy and non-pharmacotherapeutic approaches can improve symptoms, activity levels and quality of life even in patients with severe COPD. The following table of severity can help guide the management of the disease.

Table 1: Canadian Thoracic Society COPD classification by symptoms/disability

COPD STAGE	SYMPTOMS
At risk (not yet COPD)	Asymptomatic smoker or ex-smoker or chronic cough/sputum, but postbronchodilator FEV ₁ /FVC ≥ 0.7 and/or FEV ₁ ≥ 80% predicted
Mild	Shortness of breath from COPD with strenuous exercise or when hurrying on the level or walking up a slight hill. FEV ₁ 60-79% predicted
Moderate	Shortness of breath from COPD causing the patient to walk slower than most people of the same age on the level or stop after walking about 100 m on the level. FEV ₁ 40-59%
Severe	Shortness of breath from COPD resulting in the patient too breathless to leave the house, or breathless after dressing or undressing or the presence of chronic respiratory failure or clinical signs of right heart failure. FEV ₁ < 40%

Therapy should be based on a stepwise approach as below (modified from Figure 1 of Reference #6)



RECOMMENDATION 2 Smoking cessation

- Smoking is the most important cause of and contributing factor to COPD progression.
- Smoking cessation is effective in preventing disease progression even in long-term smokers.
- Effective strategies exist to aid in smoking cessation.
- Even minimal intervention should be offered to every smoker.
- Smoking cessation should be reinforced at every contact.

RECOMMENDATION 3 Education and self-management

Education of the patients and family can improve coping skills and quality of life and reduce the likelihood of hospitalization. The physician should:

- Reinforce lifestyle modifications such as smoking cessation and exercise;
- Refer the smoker with COPD to the BC Smokers Helpline (see patient guide);
- Help the patient identify resources and a support team (e.g. respirologist, pharmacist, nurse, dietitian as appropriate); and
- Refer the patient to a pulmonary rehabilitation program where available.

RECOMMENDATION 4 Active lifestyle and rehabilitation

Clinically stable COPD patients who remain limited in their activity due to their symptoms despite optimal therapy should be referred to an exercise training program. Formal pulmonary rehabilitation programs that include patient education and exercise can reduce symptoms, and improve exercise endurance and quality of life.

RECOMMENDATION 5 Immunization for influenza and pneumococcus

- Annual influenza vaccination
- Pneumococcal vaccination at least once and possibly every 5 years

RECOMMENDATION 6 Pharmacotherapy *

- First line therapy should be a short-acting inhaled beta₂-agonist and regular use of inhaled anticholinergics for symptom control (see footnote).
- Introduce long-acting beta₂-agonist if symptoms persist.
- Add inhaled corticosteroid if asthmatic, or if COPD with more frequent exacerbations (3 or more per year), or FEV₁ < 50%.
- If indications for both a long-acting beta₂-agonist and an inhaled corticosteroid exist, then a combination product containing both may be an option.
- Theophylline may be useful in some individuals with persistent symptoms despite optimal inhaled therapy. A therapeutic trial of 2-3 weeks may be considered.

Tiotropium was approved under special authority on July 2, 2007 by the BC Pharmacare Program. The criteria include moderate to severe COPD evaluated by spirometry and inadequate response after a 3-month trial of ipratropium (12 puffs/day).

The Cochrane Collaborative review of 2005 concluded that tiotropium offers some advantages over ipratropium but additional long-term studies are required to evaluate its effect on mortality and to assess its effectiveness in mild and very severe COPD.

* Current BC PharmaCare Program Limited Coverage Criteria can be found at: <http://www.health.gov.bc.ca/pharme/>

RECOMMENDATION 7 Acute exacerbations (AECOPD) require more intensive management

Acute exacerbations are characterized by sustained (48 hrs or more) worsening of shortness of breath and coughing, with or without sputum. The most common cause is a viral or bacterial infection.

Therapies should include:

- Therapy with short-acting beta₂-agonists and anticholinergic bronchodilators;
- Oral steroids (e.g. prednisone 25-50 mg/day) for 5-10 days in most moderate to severe COPD patients; and
- Antibiotic use based on risk factors (see *Appendix 1*).

Severe AECOPD complicated by acute respiratory failure is a medical emergency. Consider consultation with an emergency specialist and/or a respirologist.

RECOMMENDATION 8 Oxygen therapy

The goal of oxygen therapy is to maintain PaO₂ ≥ 60 mmHg or SpO₂ ≥ 90% at rest, on exertion and during sleep. (PaO₂ refers to partial pressure of oxygen in arterial blood, SpO₂ to % oxygen saturation)

See *Appendix 2* for Medical Indications for Home Oxygen.

RECOMMENDATION 9 Referral to a specialist

- Uncertain diagnosis
- Severe or recurrent exacerbations
- Complex comorbidities
- Young patient with limited smoking history
- Assessment for home oxygen
- Surgical options

RECOMMENDATION 10 Practice management

Physicians are encouraged to:

- Identify all patients with COPD;
- Monitor key clinical indicators of COPD using a flow sheet (attached);
- Use recall systems to ensure that patients are seen at appropriate intervals;
- Review patient records to ensure that goals of care are met; and
- Consider comorbidities.

RECOMMENDATION 11 End of Life Care

Advance planning allows patients to plan for end of life care. Making decisions about the intensity of end of life care is a highly individualized process and requires continuous review as COPD progresses.

Prior to initiating end of life care:

- Address the precipitating factors;
- Explore all active therapeutic options; and
- Consider comorbidities.

End of life care :

- Manage all symptoms (including those of co-morbid conditions, e.g. chronic pain) and address function and quality of life issues;
- Review need for home oxygen and treatment for severe dyspnea including opioids, neuroleptics and benzodiazepines;
- It is important to ensure that advanced care planning, encompassing financial and health care decisions (e.g. Representation Agreement) has been carried out;
- Decisions need to be made and documented as to whether and when to pursue hospital admission and the level of intervention. Assure that BiPAP (bilevel positive airway pressure device) is not overlooked; and
- Consultation with a respirologist may be helpful.

The BC Palliative Care Consultation Line 1 877 711-5757 offers advice from a palliative care physician on symptom management 24 hours per day, 7 days per week.

Detailed strategies to assist physicians with end of life care can be found at the American College of Chest Physicians web site: www.chestnet.org

Rationale

This guideline has been developed following review of the recommendations of the Canadian Thoracic Society for the management of chronic obstructive pulmonary disease (COPD)^{1,2} and other international strategies for the management of COPD^{3,4,5,6,7}. It is adapted for family physicians in British Columbia using the chronic care management approach.

Approximately 73,000 patients in British Columbia have been diagnosed with COPD. It is a major cause of morbidity and mortality. Women account for about 47% of the cases⁸. Most patients (95%) who develop chronic bronchitis and emphysema are smokers. Smoking cessation, even in long-term smokers, is the cornerstone of treatment. Accurate diagnosis is required, and exercise, rehabilitation and pharmacological management are important components of a disease management strategy.

A chronic disease and self-management approach directed by health professionals can significantly improve health status and reduce hospital admissions for exacerbations by 40%⁹.

Patients with COPD require education regarding disease process, treatment and prognosis with particular attention to advance care planning and end of life care.¹⁰

The Cochrane review concluded that “Tiotropium reduced COPD exacerbations and related hospitalisations compared to placebo and ipratropium. It also improved health related quality-of-life and symptom scores among patients with moderate and severe disease, and may have slowed decline in FEV₁. Additional long-term studies are required to evaluate its effect on mortality and change in FEV₁ to clarify its role in comparison to, or in combination with, long-acting beta 2-agonists and to assess its effectiveness in mild and very severe COPD.¹¹

Patients receiving tiotropium experienced fewer exacerbations and improved quality of life compared to those receiving ipratropium in a small clinical trial (356 patients treated). The trial showed a trend to increased mortality in the treatment group.¹² The increase was not statistically significant. More trials are required to determine effects on survival.

References

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Revised Date: November 14, 2007

This guideline is based on scientific evidence current as of the revised date.

Contact Information

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This guideline was developed by the Guidelines and Protocols Advisory Committee, approved by the British Columbia Medical Association and adopted by the Medical Services Commission.

The principles of the Guidelines and Protocols Advisory Committee are to:

- encourage appropriate responses to common medical situations
- recommend actions that are sufficient and efficient, neither excessive nor deficient
- permit exceptions when justified by clinical circumstances.

Appendices

Appendix A – Antibiotic treatment recommendations for acute exacerbations of COPD (AECOPD)

Appendix B – Medical Indications for Home Oxygen

Associated Documents

The following documents accompany this guideline:

- Flow Sheet
- Patient Guide

Applicable Diagnostic Code: 492

Appendix A: Antibiotic treatment recommendations for acute exacerbations of COPD (AECOPD)

	SYMPTOMS AND RISK FACTOR	ANTIBIOTIC CHOICE
Simple (COPD without risk factor)	<ul style="list-style-type: none"> • Increased cough and sputum, sputum purulence, increased dyspnea • $FEV_1 \geq 50\%$ • <4 exacerbations/yr 	Amoxicillin, doxycycline trimethoprim/sulfamethoxazole, second or third generation cephalosporins, extended spectrum macrolides; Consider beta-lactam/beta-lactamase inhibitor, fluoroquinolone as alternatives
Complicated (simple plus risk factors)	<ul style="list-style-type: none"> • $FEV_1 < 50\%$ • ≥ 4 exacerbations/yr • ischemic heart disease • use of home oxygen • chronic oral steroid use • antibiotic use in past 3 months 	Beta-lactam/beta-lactamase inhibitor; fluoroquinolone <ul style="list-style-type: none"> • May require parenteral therapy • Consider referral to a specialist or hospital

Appendix B: Medical Indications for Home Oxygen

Note: This is an example from the Interior Health Authority. Consult your local health authority for any variations

1. At Rest

a. $PaO_2 \leq 55\text{mm Hg}$

In extenuating circumstances the Home Oxygen Program (HOP) will accept oximetry $SpO_2 \leq 88\%$ sustained continuously for 6 minutes, or

b. $PaO_2 = 56\text{-}60\text{ mmHg}$

If any of the following conditions apply:

1. CHF with ejection fraction <20%
2. Cor pulmonale (right heart failure)
3. Pulmonary hypertension

In extenuating circumstances HOP will accept oximetry $SpO_2 \leq 90\%$ sustained continuously for 6 minutes (must be documented)

2. Nocturnal Oxygen

- a. $SpO_2 \leq 89\%$ for >20 % of a minimum 4 hour nocturnal oximetry study, or
- b. $SpO_2 \leq 89\%$ for >10% of a minimum 4 hour nocturnal oximetry study

If any of the following conditions apply:

- i. CHF with ejection fraction <20%
- ii. Cor pulmonale
- iii. Pulmonary hypertension

Note: Obstructive sleep apnea (OSA) must be ruled out or maximally treated prior to application and/or approval of funding.

3. Exertional Oxygen

- a. $SpO_2 \leq 87\%$ sustained continuously for >1 minute during a 6 minute level surface walk study and shall not include post exertion dips.
- b. Transient dips $\leq 87\%$ during the walk do not qualify for subsidy.



Chronic Obstructive Pulmonary Disease Patient Care Flow Sheet



This Flow Sheet is based on the Guideline:

Chronic Obstructive Pulmonary Disease (COPD) Web site: www.BCGuidelines.ca

NAME OF PATIENT	BIRTHDATE
COMORBID CONDITIONS	PHN
	DATE OF DIAGNOSIS

CRITERIA FOR DIAGNOSIS (SEE GUIDELINE)

FEV_1 (< 80% predicted and FEV_1/FVC < 0.7 postbronchodilator)

		DATE (YY/MM/DD)							
SEVERITY	REVIEW EACH VISIT ROUTINE/EXACERBATION	INITIAL REVIEW (BASELINE)							
	SEVERITY-FEV ₁ (if available)	Mild							
		Moderate							
		Severe							
THERAPY	See Rec 6	Short acting beta ₂ agonist							
		Long acting bronchodilators							
		Combination							
		Anticholinergic							
		Inhaled corticosteroid							
		Theophylline							
	Other								
EDUCATION REMINDERS	<input type="checkbox"/> Smoking cessation <input type="checkbox"/> Explain what COPD is & cause <input type="checkbox"/> Encourage physical activity <input type="checkbox"/> Refer for rehabilitation <input type="checkbox"/> Medication use & side effects <input type="checkbox"/> Call back/Return visit <input type="checkbox"/> Refer to patient Guide								
EXACERBATION DETAILS	Note Details	Antibiotics; Steroids; Hospitalization; Referral, other:							

NOTES

Chronic Obstructive Pulmonary Disease

A GUIDE FOR PATIENTS

Effective Date: January 2005

Chronic Obstructive Pulmonary Disease (COPD)

Chronic obstructive pulmonary disease includes respiratory disorders such as chronic bronchitis and emphysema that make breathing difficult. Smoking is the most important cause of these diseases. If you smoke, quitting will reduce the severity of the disease and help you improve the quality of life over a much longer time.

Chronic bronchitis and emphysema

In chronic bronchitis, inflammation occurring in the bronchial tubes may cause narrowing, which makes breathing difficult. A chronic cough that brings up sputum is present.

In emphysema, lung tissue and the small air sacs (alveoli) at the end of the airways become damaged and air becomes trapped in the lungs leading to shortness of breath.

COPD Exacerbations

An exacerbation is a worsening of the condition that includes the following signs:

- rapid increase in cough
- mucus production (especially if yellow or green)
- increased shortness of breath
- blue lips or fingers

Exacerbations can be serious and life-threatening. Prompt and effective treatment can help most people recover to the level of breathing before the exacerbation.

Diagnosis

A medical history, physical examination and breathing tests are used to diagnose COPD.

Treatment

Although there is no cure for COPD, the best way to slow the progression of the disease is to quit smoking. Medications may reduce or relieve symptoms. Counseling, education, and exercise can help improve quality of life. Pulmonary rehabilitation programs are available in some areas and these have been proven effective.

Quitnow by Phone

A free telephone service offering advice, information and support about quitting smoking. Call toll-free within British Columbia: 1 877 455-2233. The Quitnow Helpline is staffed from 10am to 6pm. After hours and on weekends, callers are invited to leave a message and a Quit Specialist will return the call during service hours.

The BC Smokers' Helpline service is tailored to the individual needs of each caller.

- **Smokers who want to quit** can get information about all the different methods, help with deciding what method may be best for them, and what to expect once they quit.
- **People who have just quit** may wish information about coping with withdrawal, and how to manage concerns about things like weight gain or sleep disturbance.
- **Smokers who are thinking of quitting** can discuss the pros and cons with a trained Quit Specialist. And the best thing is: no hassle, no pressure.
- **Smokers who wish to keep smoking** are also welcome to call the line; they don't push anyone to quit smoking and don't judge people for smoking, and a chat may provide useful information.
- **Friends and family members concerned about someone's smoking** are encouraged to call to discuss what they can do to help.

Living with COPD

Remove factors that can worsen your condition such as smoking. Balance exercise and rest periods. Participation in a pulmonary rehabilitation program or a chronic disease self-management program can be helpful. The BC Lung Association has a list of contacts for Better Breathers clubs in different areas of the province (see web site below) or call **1 800 665-5864** for further information including other programs such as Breathworks **1 866 717-2673**.

End of Life Planning

Planning for end of life circumstances is necessary for many patients in the advanced stages of COPD.

Consider discussing end of life concerns with your physician and writing a legal document (advance directive) that helps ensure your health care wishes will be respected. An advance directive contains your preferences for treatment, a living will and a power of attorney. More details related to end of life care can be found at the BC HealthGuide web site listed below.

British Columbia Internet Resources

The BC Ministry of Health Chronic Disease Management web site has more detailed information about the management of diseases such as COPD.

<http://www.health.gov.bc.ca/cdm/patients>

The BC HealthGuide Online provides detailed information on managing COPD and end of life planning.

<http://bchealthguide.org>

BC Lung Association offers excellent materials for the control of COPD.

<http://www.bc.lung.ca>

**Contact the BC Lung Association or your local Health Authority
for access to a Pulmonary Rehabilitation Program**

