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 (FEV₁ less than 80% and FEV₁/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 FEV₁ (and >180 ml in adults from the baseline 15 minutes after use of an inhaled short-acting beta₂-agonist.
- In some situations a corticosteroid trial may be appropriate to differentiate COPD from asthma.

If clinical uncertainty remains, refer to a specialist.

*FEV₁: 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**

<table>
<thead>
<tr>
<th>COPD STAGE</th>
<th>SYMPTOMS</th>
</tr>
</thead>
<tbody>
<tr>
<td>At risk (not yet COPD)</td>
<td>Asymptomatic smoker or ex-smoker or chronic cough/sputum, but postbronchodilator FEV₁/FVC ≥ 0.7 and/or FEV₁ ≥ 80% predicted</td>
</tr>
<tr>
<td>Mild</td>
<td>Shortness of breath from COPD with strenuous exercise or when hurrying on the level or walking up a slight hill</td>
</tr>
<tr>
<td>Moderate</td>
<td>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</td>
</tr>
<tr>
<td>Severe</td>
<td>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</td>
</tr>
</tbody>
</table>

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

- **Individuals at risk:**
  - Smokers
  - Environmental exposure

- **All patients:**
  - Smoking cessation
  - Healthy lifestyle
  - Patient education

- **First-line therapy:** short-acting beta₂ – agonists and anticholinergics

- **Additional therapy:** inhaled long-acting beta₂ – agonists

- **Pulmonary rehabilitation**

- **Oxygen**

- **Inhaled corticosteroids (in certain patients)**

- **Theophylline (in certain patients)**

- **Surgery (in certain patients)**

- **End of life care**

**Increasing severity of COPD**
**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.

The current guideline of the Canadian Thoracic Society suggests that the long-acting inhaled anticholinergic, tiotropium, may be helpful; however, a review by BC PharmaCare concluded that there is insufficient evidence that tiotropium represents a therapeutic advantage over ipratropium. Tiotropium is not currently a benefit under the BC PharmaCare program. The Cochrane Collaborative is currently evaluating the evidence for the use of tiotropium.

*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 cases\(^8\). 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\(^10\).
References


Sponsors

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. Partial funding for this guideline was provided by the Health Canada Primary Health Care Transition Fund.

Revised Date: April 1, 2007

This guideline is based on the scientific evidence at the time of the effective date.

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The principles of the Guidelines and Protocols Advisory Committee are:
- to encourage appropriate responses to common medical situations
- to recommend actions that are sufficient and efficient, neither excessive nor deficient
- to permit exceptions when justified by clinical circumstances.
Appendix 1: Antibiotic treatment recommendations for acute exacerbations of COPD (AECOPD)

<table>
<thead>
<tr>
<th>SYMPTOMS AND RISK FACTOR</th>
<th>ANTIBIOTIC CHOICE</th>
</tr>
</thead>
</table>
| **Simple** (COPD without risk factor) | • Increased cough and sputum, sputum purulence, increased dyspnea  
• FEV₁ ≥ 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) | • FEV₁ < 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  
• May require parenteral therapy  
• Consider referral to a specialist or hospital |

Appendix 2: 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. PaO₂ ≤ 55mm Hg
      In extenuating circumstances the Home Oxygen Program (HOP) will accept oximetry SpO₂ ≤ 88% sustained continuously for 6 minutes, or
   b. PaO₂ = 56-60 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 SpO₂ ≤ 90% sustained continuously for 6 minutes (must be documented)

2. **Nocturnal Oxygen**
   a. SpO₂ ≤ 89% for >20% of a minimum 4 hour nocturnal oximetry study, or 
   b. SpO₂ ≤ 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. SpO₂ ≤ 87% sustained continuously for >1 minute during a 6 minute level surface walk study and shall not include post exertion dips. 
   b. Transient dips ≤ 87% during the walk do not qualify for subsidy.
Chronic Obstructive Pulmonary Disease
Patient Care Flow Sheet

<table>
<thead>
<tr>
<th>SEVERITY</th>
<th>INITIAL REVIEW (BASELINE)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Mild</td>
<td>SEVERITY-FEV₁</td>
</tr>
<tr>
<td>Moderate</td>
<td>(if available)</td>
</tr>
<tr>
<td>Severe</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>THERAPY</th>
<th>SEE REC 6</th>
</tr>
</thead>
<tbody>
<tr>
<td>Short acting beta₂ agonist</td>
<td></td>
</tr>
<tr>
<td>Long acting bronchodilators</td>
<td></td>
</tr>
<tr>
<td>Combination</td>
<td></td>
</tr>
<tr>
<td>Anticholinergic</td>
<td></td>
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<tr>
<td>Inhaled corticosteroid</td>
<td></td>
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<tr>
<td>Theophylline</td>
<td></td>
</tr>
<tr>
<td>Other</td>
<td></td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>EDUCATION REMINDERS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Smoking cessation</td>
</tr>
<tr>
<td>Explain what COPD is &amp; cause</td>
</tr>
<tr>
<td>Encourage physical activity</td>
</tr>
<tr>
<td>Refer for rehabilitation</td>
</tr>
<tr>
<td>Medication use &amp; side effects</td>
</tr>
<tr>
<td>Call back/Return visit</td>
</tr>
<tr>
<td>Refer to patient Guide</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>EXACERBATION DETAILS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Antibiotics; Steroids;</td>
</tr>
<tr>
<td>Hospitalization;</td>
</tr>
<tr>
<td>Referral, other:</td>
</tr>
<tr>
<td>Note Details</td>
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</tbody>
</table>

CRITERIA FOR DIAGNOSIS (SEE GUIDELINE)

\[ \text{FEV₁} (< 80\% \text{ predicted and FEV₁/FVC} < 0.7 \text{ postbronchodilator}) \]

NOTES
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.

continued...
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.

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**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