Chronic Obstructive Pulmonary Disease (COPD)

Effective Date: December 30, 2009

Scope

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

Diagnostic Code: 496 (chronic airways obstruction, not elsewhere classified)

Diagnosis

COPD is under-diagnosed. A definitive diagnosis is made with spirometry.

a) Signs and symptoms indicating the need for spirometry testing.

Use clinical judgment to select patients for spirometry testing. Consider spirometry testing for new COPD patients at high risk:*

- smokers or ex-smokers 40 years of age or older
- persistent cough or sputum production
- frequent respiratory infections
- unexplained shortness of breath

Chest X-ray is usually done to exclude co-morbidities. A chest X-ray may suggest COPD, but the definitive diagnosis of COPD requires spirometry.

**Some patients with COPD may not have used tobacco. Other risk factors include: occupational exposures, alpha-1 antitrypsin deficiency, early childhood lung infections, and exposure to air pollutants, particularly where wood is burned indoors.*

b) Diagnosis by spirometry

Note: In office spirometry requires approval by the College of Physicians and Surgeons Diagnostic Accreditation Program.

A post bronchodilator FEV_1 / FVC† ratio of less than 0.7 defines airflow obstruction that is not fully reversible and establishes a diagnosis of COPD.

Note: COPD and asthma commonly coexist

- Compared to the baseline FEV_1, asthmatic patients will have a 12% or greater improvement in FEV_1 15 minutes after the use of an inhaled short-acting $beta_2$ agonist. In adults, the FEV_1 also increases by more than 200 ml.[1]
- Long term improvements in spirometry may indicate asthma.
- In some situations, a corticosteroid trial may be appropriate to differentiate COPD from asthma.

†FEV_1: Forced expiratory volume in the first second, FVC: forced vital capacity

c) COPD classification by symptoms and spirometry

Table 1: COPD classification by symptoms/disability		
COPD stage‡	**Symptoms**	**Spirometry**
At Risk (not yet COPD)	Asymptomatic smoker or ex-smoker or chronic cough/ sputum	$FEV_1 \geq 80\%$ predicted $FEV_1 / FVC \geq 0.7$
Mild	Shortness of breath from COPD with strenuous exercise or while hurrying on the level or walking up a slight hill	FEV_1 60% - 79% predicted $FEV_1 / FVC < 0.7$
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% predicted $FEV_1 / FVC < 0.7$
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 30% - 39% predicted $FEV_1 / FVC < 0.7$
Very Severe		$FEV_1 < 30\%$ predicted $FEV_1 / FVC < 0.7$

Table 1 adapted from the Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease - 2007 update.[2]
‡*Symptoms may not correlate directly with clinical signs. As a result, patients may belong in more than 1 COPD stage (namely, clinical versus spirometric stages).*

If clinical uncertainty of the diagnosis remains, specialist consultation is recommended.

Management of COPD

a) Care objectives

Physicians are encouraged to:
- identify new patients with COPD by spirometry
- monitor key clinical indicators of COPD using a flow sheet (refer Appendix A – Patient Care Flow Sheet) or an equivalent care plan
- use recall systems to ensure that patients are seen at appropriate intervals; at least twice yearly
- review patient records to ensure that goals of care are met (refer Appendix A – Patient Care Flow Sheet)
- consider co-morbidities

The therapeutic goals of management of COPD are to:[2]
- prevent disease progression (smoking cessation)
- alleviate breathlessness and other respiratory symptoms
- improve exercise tolerance and daily activity
- reduce frequency and severity of exacerbations
- treat exacerbations and complications of the disease
- improve health status
- reduce mortality

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.

Figure 1: Therapy should be based on a stepwise approach.

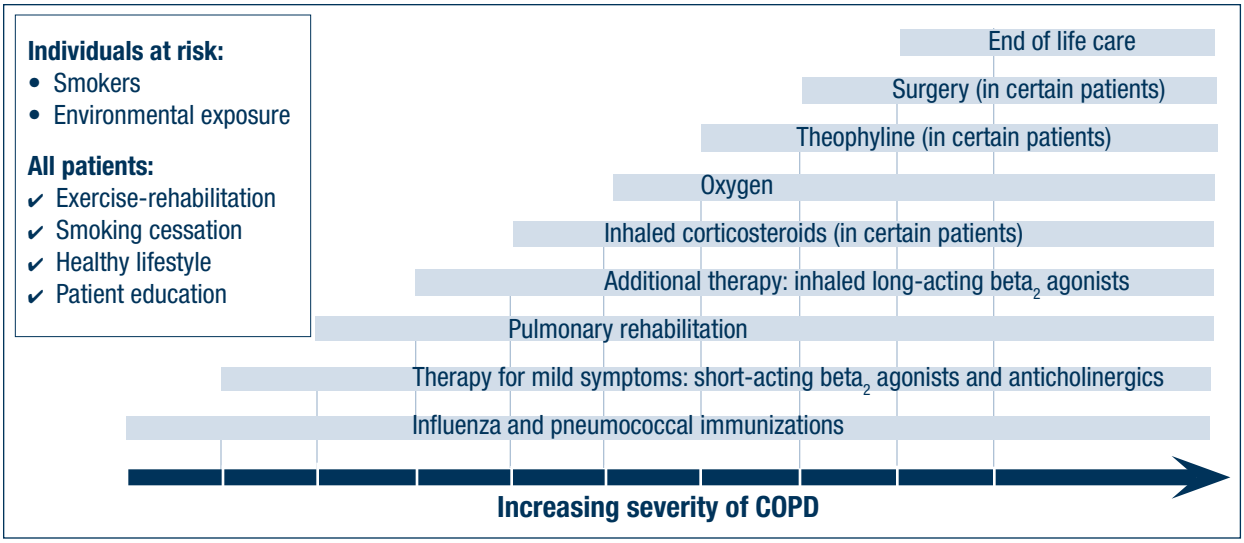

Figure 1 adapted from the Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease - 2007 update.[2]

b) Lifestyle management

Smoking Cessation

- Smoking is the most important cause of and contributing factor for COPD progression.
- Smoking cessation is the most important factor in slowing the progression of COPD.
- Smoking cessation is effective in preventing disease progression even in long-term smokers.
- Effective strategies exist to aid in smoking cessation. These include:
  - nicotine replacement therapy which may need to be used long term
  - other pharmacotherapy (note that these have significant side effects)
- Even minimal intervention may be helpful and should be offered to every smoker. Counselling may be appropriate.
- Consider referral of the smoker with COPD to the BC Smokers Helpline (refer Patient Guide).
- Smoking cessation of the patient and household contacts should be reinforced at every contact.
- For additional information, refer to the guideline *Cardiovascular Disease – Primary Prevention, Appendix A – Part 1: Smoking Cessation* available at www.BCGuidelines.ca

c) Education and self-management

Education of the patients and family can improve coping skills and quality of life and reduce the likelihood of hospitalization from COPD. The physician is encouraged to:

- reinforce smoking cessation
- encourage exercise
- refer the smoker with COPD to the BC Smokers Helpline (refer Patient Guide)
- help the patient identify resources and a support team (e.g. physician, pharmacist, nurse, dietitian as appropriate)
- refer the patient to a pulmonary rehabilitation program where available and to community respiratory services
- encourage patients to stay indoors when air quality is poor, as air quality may have a significant effect on COPD

Remaining active despite symptoms of shortness of breath must remain a priority for all patients with COPD. Clinically stable COPD patients whose activities remain symptom-limited despite optimal therapy should be referred to an exercise training program. Formal pulmonary rehabilitation programs that include patient education and exercise can reduce symptoms, decrease exacerbations, and improve exercise endurance and quality of life.

d) Pharmacologic management (refer Appendix B - Prescription Medication Table for Chronic Obstructive Pulmonary Disease)

Bronchodilators are the mainstay of COPD pharmacotherapy. Pharmacological treatment of COPD has not been shown to reverse, slow, or prevent progressive decline in lung function, but can improve symptoms, reduce exacerbations and hospitalizations, and improve quality of life. Bronchodilators reduce air trapping, dyspnea, and improve quality of life even if improvement is not seen on spirometry.

- Patients with mild COPD should be using a short-acting inhaled $beta_2$ agonist as needed, and regular use of inhaled anticholinergics for symptom control.
- The risks and benefits of anticholinergics should be discussed with the patient. The safety of tiotropium and ipratropium is a controversial area with studies showing a large range in clinical outcomes and adverse effects. While patients experience symptom relief, increased risks for cardiovascular death, myocardial infarction (MI), stroke, and all-cause mortality have been found in a number of long term trials. For example, comparisons of tiotropium to placebo, the NNT (number needed to treat) to prevent a COPD exacerbation is 21, and to prevent hospitalization, the NNT is 20. This should be considered with the NNH (number needed to harm) of 40 for cardiovascular death and 174 for MI.[3] However, there is still controversy; a more recent randomized controlled trial over 4 years (The Uplift Trial, 5993 patients randomized) failed to find a statistically significant increase in mortality or cardiovascular events, although these were secondary endpoints.[4]
- The risks and efficacy of inhaled corticosteroids, whether used alone or in combination therapy, also show a large range of results in randomised control trials and are also a controversial area of study. Again, the benefits to the patient in reduced exacerbations and symptom relief need to be balanced with the increased risk of pneumonia. A review of combination therapy of salmeterol and fluticasone studies showed an increased risk of pneumonia.[5]
- Evaluate the patient's inhaler technique regularly. Consider prescribing a spacer for metered dose inhalers.
- Introduce a long-acting $beta_2$ agonist if symptoms persist.
- Add inhaled corticosteroid if asthma coexists, or if COPD with exacerbations (1 or more per year), or $FEV_1 < 50\%$.
- If indications for both a long-acting $beta_2$ agonist and an inhaled corticosteroid exist, then consider a combination product containing both.
- Theophylline may be useful in select patients with persistent symptoms despite optimal inhaled therapy.

e) Ongoing care

Immunization against influenza and pneumococcal infections:

- annual influenza vaccination
- pneumococcal vaccination at least once and repeated in 5-10 years

Oxygen therapy

- The goal of oxygen therapy is to maintain $PaO_2 \geq 60$ mmHg or $SpO_2 \geq 90\%$ at rest (refer to local health authority for local criteria), on exertion and during sleep. (PaO_2 = partial pressure of oxygen in arterial blood, SpO_2 = % oxygen saturation).
- Oxygen therapy may be a useful addition to exercise therapy.
- Refer to Appendix C for an example of medical indications for home oxygen.

f) 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. Develop an exacerbation plan with the patient (see example in Appendix D - COPD Flare up Action Plan). Severe AECOPD complicated by acute respiratory failure is a medical emergency.

Therapies should include:

- therapy with short-acting beta$_2$ agonists and anticholinergic bronchodilators
- oral corticosteroids (e.g. prednisone 25-50 mg/day) for less than two weeks in most moderate to severe COPD patients. A dose of 30 – 40 mg of prednisone equivalent per day has been used in practice.[2]
- antibiotic use is based on risk factors (see Appendix E - Antibiotic Treatment Recommendations for Acute Exacerbations of COPD (AECOPD)).

g) Manage co-morbidities

COPD patients commonly present with several co-morbidities which reduce quality of life and significantly increase the cost of care to patients and the health care system. Once detected, these co-morbidities should be treated aggressively.[6]

In patients with mild to moderate COPD, cardiovascular diseases are the leading causes of hospitalizations and the second leading cause of mortality after lung cancer. In severe and very severe COPD, respiratory failure and pneumonia are the leading causes of morbidity and mortality. However, even in these patients, cardiovascular diseases remain a major concern.[7]

Table 2: Common Co-Morbidities with COPD

Cardiovascular disease • Cardiac arrhythmias • Ischemic heart disease • Heart failure	Musculoskeletal disorders • Osteoporosis • Peripheral muscle weakness
Mental health disorders • Depression • Anxiety • Sleep disorders	Systemic complications • Weight loss • Cachexia • Chronic anemia or polycythemia
Cancer	Diabetes mellitus

h) Indications for specialist referral

- The diagnosis is uncertain.
- A young patient with COPD and limited smoking history or those with severe symptoms and disability which is disproportionate to their lung function decline.
- There are signs and symptoms of hypoxemic or hypercarbic respiratory failure.
- There are severe or recurrent exacerbations and treatment failure.
- The patient has severe COPD and disability requiring more intensive interventions including surgical therapies.
- More intensive co-morbidity assessment and management is required.
- Difficulty in assessing home oxygen or sleep disorders.

i) End of life care

Prior to initiating end of life care:

- address the precipitating factors;
- explore all active therapeutic options; and
- consider co-morbidity

End of life care

- Manage all symptoms (including those of co-morbid conditions) and address function and quality of life issues.
- Review need for home oxygen and treatment for severe dyspnea including opioids, neuroleptics and benzodiazepines.
- Maintain patient autonomy. Most patients are willing to discuss advance care planning and it is best done in a non-acute setting.
- 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 what are the options for care and the level of intervention.
- Ensure that BiPAP (bilevel positive airway pressure device) is not overlooked.
- Consultation with a specialist in respirology, palliative care or geriatric medicine may be helpful.

Advance care 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. Refer to the Resources section for resources on end of life care.

Rationale

COPD is a respiratory disorder largely caused by smoking. It is characterized by progressive, partially reversible airway obstruction and lung hyperinflation, systemic manifestations, and increasing frequency and severity of exacerbations.[2]

This guideline has been developed following review of the recommendations of the Canadian Thoracic Society and other international strategies for the management of COPD.[2, 7-17] It is adapted for family physicians in British Columbia using the chronic care management approach.

According to administrative health services data from the BC Ministry of Health, approximately 73,000 individuals in British Columbia have been diagnosed with COPD (approximately 4.3% of British Columbians aged 45 years and older). The true prevalence is likely much higher as Burden of Obstructive Lung Disease study (BOLD) measured moderate to severe airflow obstruction indicative of COPD in 8.2% of the population of Vancouver aged 40 and over.[20] Women account for about 47% of the cases.[12]

COPD is the only leading cause of death whose mortality rate continues to increase.[20]

A chronic disease and self-management approach directed by health professionals can significantly improve health status and reduce hospital admissions for exacerbations by 40%.[13]

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Resources

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

Other resources for end of life care can be found at www.lung.ca and at the Ottawa Health Research Institute: http://decisionaid.ohri.ca/decaids.html (Making Choices: The Use of Intubation and Mechanical Ventilation for Severe Chronic Pulmonary Disease)

List of Abbreviations

AECOPD	acute exacerbations of COPD
BiPAP	bilevel positive airway pressure device
COPD	chronic obstructive pulmonary disease
FEV_1	forced expiratory volume in the first second
FVC	forced vital capacity
NNH	number needed to harm
NNT	number needed to treat
PaO_2	partial pressure of oxygen in arterial blood
SABD	short-acting bronchodilator
SpO_2	percent oxygen saturation

Appendices

Appendix A - Patient Care Flow Sheet
Appendix B - Prescription Medication Table for Chronic Obstructive Pulmonary Disease (COPD)
Appendix C - Medical Indications for Home Oxygen for Stable COPD Patients
Appendix D - COPD Flare-up Action Plan
Appendix E - Antibiotic Treatment Recommendations for Acute Exacerbations of COPD (AECOPD)

Associated Documents

The following documents accompany this guideline:
- Patient Guide
- Summary

This guideline is based on scientific evidence current as of the Effective Date.

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.

A **PDA** version of this guideline is also available at www.Clinipearls.ca/BCGuidelines

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

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Chronic Obstructive Pulmonary Disease Patient Care Flow Sheet

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This flow sheet is based on the guideline: *Chronic Obstructive Pulmonary Disease (COPD)* available at www.BCGuidelines.ca

NAME OF PATIENT	BIRTHDATE
CO-MORBID CONDITIONS	PHN
	DATE OF DIAGNOSIS

Spirometry

Date _____

Patient's FEV_1 as a percent of their predicted value _____ FEV_1/FVC ratio _____

☐ Confirmation of a post-bronchodilator FEV_1/FVC ratio of < 0.7 for a COPD diagnosis

COPD Classification

By Spirometry ☐ mild ☐ moderate ☐ severe ☐ very severe

Assessment

Height									
Weight									
Smoker S Non-smoker N									
Quit date									
Smoker: Provide brief intervention									
Give Quit Line # 1-877-455-2233									
Referral to stop smoking program									
Influenza vaccine									
Pneumococcal vaccine									
Short-acting $beta_2$ agonist									
Anticholinergic (Long-acting if > mild COPD)									
Long-acting $beta_2$ agonist									
Combination LABA/ICS (For FEV_1 % predicted < 50% plus >1 exacerbation in past 12 months or significant reversibility in FEV_1 after bronchodilator)									
Theophylline									
Severe COPD: supplemental oxygen									
Obstructive sleep apnea screening?									
Date of last exacerbation									
Exacerbation action plan									
Antibiotic Rx									
Prednisone Rx									
Review medications and side effects									
Refer to Pulmonary rehab									
Provide disease specific education									
Discuss & evaluate inhaler use & provide handouts									
Specialist referral									

Diagnostic Code: 496

Appendix B: Prescription Medication Table for Chronic Obstructive Pulmonary Disease (COPD)

Generic Name	Trade Name (formulation) [strengths]	Standard Rx for Adults (max. dose per day)	Approximate Cost*	PharmaCare Coverage
Short-Acting Beta$_2$ Agonists Inhaled (SABA)				
salbutamol	**Airomir™, Ventolin® HFA, G** (pMDI) [100 µg]	100-200 µg qid prn (max. 800 µg per day)	$4.14 - $14.56/100 doses G:$2.48 - $4.96/100 doses	Regular benefit, LCA
	Ventolin® Diskus® (DPI) [200 µg]	200 µg tid-qid prn (max. 800 µg per day)	$23.49/100 doses	Not a benefit
	Ventolin®, G (inh. sol.)	2.5 -5 mg qid prn	G:$26.04 - $63.13/100 doses	Limited coverage
terbutaline	**Bricanyl®** Turbuhaler® (DPI) [500 µg]	500 µg prn (max. 3 mg per day)	$7.86/100 doses	Regular benefit
Short-Acting Anticholinergic Inhaled (SAAC)				
ipratropium	**Atrovent® HFA** (pMDI) [20 µg]	40 µg tid-qid (max. 240 µg per day)	$0.59 - $0.78/day	Regular benefit
	G (inh. sol.)	500 µg tid-qid (max. 2 mg per day)	G:$3.55 - $6.46/day	Limited coverage
Long-Acting Anticholinergic Inhaled (LAAC)				
tiotropium	**Spiriva®** Handihaler (DPI) [18 µg]	18 µg once daily	$2.25/day	Limited coverage‡
Short-Acting Beta$_2$ Agonist/Short-Acting Anticholinergic Inhaled Combination (SABA/SAAC)				
fenoterol/ ipratropium	**Duovent® UDV** (inh. sol.)	4 mL q6h prn	$14.15/day	Not a benefit
salbutamol/ ipratropium	**Combivent®, G** (inh. sol.)	2.5 mL tid-qid	$2.90 - $3.87/day G:$1.78 - $2.38/day	Limited coverage
Inhaled Corticosteroids (ICS)				
beclomethasone	**Qvar™** (pMDI) [50 and 100 µg]	50-400 µg bid (max. 800 µg per day)	LD $0.31/day HD $2.50/day	Regular benefit
budesonide	**Pulmicort®** Turbuhaler® (DPI) [100, 200, 400 µg]	200-400 µg bid (max. 2400 µg per day)	LD $0.65 /day HD $1.17/day	Regular benefit
	Pulmicort® Nebuamp® (inh. sol.)	1-2 mg bid	LD $3.53/day HD $7.06/day	Limited coverage
ciclesonide	**Alvesco®** (pMDI) [100 and 200 µg]	100-200 µg daily (up to 400 µg bid)	LD $0.38/day HD $0.63/day	Regular benefit
fluticasone	**Flovent® HFA** (pMDI) [125 and 250 µg]	100-500 µg bid (max. 2000 µg bid)	LD $0.85/day HD $2.88/day	Regular benefit
	Flovent® Diskus (DPI) [100, 250 and 500 µg]	100-500 µg bid (max. 2000 µg per day)	LD $0.85/day HD $2.88/day	Regular benefit

Long-Acting Beta$_2$ Agonists Inhaled (LABA)				
formoterol fumarate	**Foradil®** (DPI) [12 µg]	12-24 µg bid (max. 48 µg per day)	LD $1.67/day HD $1.34/day	Limited coverage†
formoterol fumarate dihydrate	**Oxeze®** Turbuhaler (DPI) [6 and 12 µg)	6-12 µg bid (max. 48 µg per day)	LD $1.17/day HD $1.55/day	Limited coverage†
salmeterol	**Serevent® Diskus, Serevent® Diskhaler** (DPI) [50 µg]	50 µg bid	$1.95/day	Limited coverage

Inhaled Corticosteroid / Long-acting Beta$_2$ Agonist Combination (ICS/LABA)				
budesonide/ formoterol	**Symbicort®** Turbuhaler® (DPI) [200/6 and 400/12 µg]	400/12 µg bid	LD $1.07/day HD $2.78/day	Limited coverage†
fluticasone/ salmeterol	**Advair® Diskus** (DPI) [250/50 and 500/50 µg]	i puff bid	LD $2.79/day HD $4.75/day	Limited coverage
fluticasone/ salmeterol	**Advair®** (pMDI) [125/25 and 250/25 µg]	ii puffs bid	LD $3.34/day HD $4.75/day	Limited coverage

Theophylline (oral)				
aminophylline	**Phyllocontin®** oral sustained release tablets	225-350 mg po q12h¶	$0.46 - $0.59/day	Regular benefit
theophylline	**Theolair™,** G oral solution	100 mg po qid¶	$2.04/day	Regular benefit
theophylline	G oral extended release (12-hour) tablets	200-300 mg po q12h¶	$0.30 - $0.57/day G:$0.29 - $0.30/day	Regular benefit, LCA
	Uniphyl® oral extended release (24-hour) tablets	400-600 mg po qhs¶ (max. 10-13 mg/ kg/day based on IBW or 900 mg/day whichever is less in non-smoking adults)	$0.53 - $0.65/day	Regular benefit

Abbreviations and footnotes: DPI = dry powder inhaler; **G** = generics available; **HD** = high dose; **HFA** = Alternate propellant hydrofluoroalkane formulation; **IBW** = Ideal Body Weight; **inh. sol.** = inhalation solution; **LD** = low dose; **max.** = maximum; **pMDI** = pressurized metered dose inhaler (aerosol); **Nebs** = nebules; **UDV** = Unit Dose Vial

* Prices are approximate retail cost, not including dispensing fee.

‡ PharmaCare coverage for tiotropium by inhalation is currently limited to patients with diagnosis of COPD where $FEV_1 \leq 65\%$ and $FEV_1/FVC < 0.7$ plus inadequate response after a 3 month trial of ipratropium at a dose of 12 puffs daily.

† Limited Criteria coverage does not include COPD.

¶ Adjust dose based on serum levels (therapeutic 55-110 µmol/L); To minimize toxicity aim for serum levels at the lower end of therapeutic. Serum levels less than 55 µmol/L have been associated with good bronchodilator effect. Drug interactions causing decreased serum levels: alcohol, carbamazepine, phenobarbital, phenytoin, rifampin, tobacco smoking; drug interactions causing increased serum levels: amiodarone, cimetidine, ciprofloxacin, clarithromycin, erythromycin, fluvoxamine, isoniazid, mexiletine, propranolol, verapamil

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Note: Please review product monographs at http://webprod.hc-sc.gc.ca/dpd-bdpp/index-eng.jsp and regularly review current Health Canada advisories, warnings and recalls at: http://www.hc-sc.gc.ca/ahc-asc/media/advisories-avis/index_e.html

See http://www.health.gov.bc.ca/pharmacare/ for further information.

PharmaCare Coverage Explanations

Regular benefit drugs: do not require Special Authority. Patients may receive full or partial coverage, since some of these drugs are included in the Low Cost Alternative (LCA) program or Reference Drug Program (RDP).
LCA: when multiple medications contain the same active ingredient (usually generic products), patients receive full coverage for the drug with the lowest average PharmaCare claimed price. The remaining products are partial benefits.
Limited coverage drugs: require Special Authority. These drugs are not normally regarded as first-line therapies or there are drugs for which a more cost-effective alternative exists.
In all cases: coverage is subject to drug price limits set by PharmaCare and to the patient's PharmaCare plan rules and deductibles.

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Appendix C: Medical Indications for Home Oxygen for Stable COPD Patients

Note: This is an example from the Fraser Health Authority. Consult your local health authority for local criteria.

Objectives of Home Oxygen Therapy

- Oxygen therapy should aim for an arterial PaO_2 of 60 to 65 mm Hg (oxygen saturation greater than 90 per cent), at rest, and/or on exertion, and/or for nocturnal use.
- Reduction in the complications of chronic hypoxia.
- Increased activities of daily living.

At rest (on room air): Pa O2 ≤ 55 mmHg; OR SpO_2 always ≤ 88% sustained continuously for 6 (six) minutes; OR PaO_2 = 56-60 mmHg with evidence of Cor Pulmonale, Pulmonary Hypertension, or Heart Failure, or polycythemia.

On exertion (6 minute walk): SpO_2 ≤ 87% (on room air) sustained continuously for 1 (one) minute during a 6 (six) minute flat surface walk.

Nocturnal Use: Nocturnal oximetry (minimum 4 hour study) with SpO_2 ≤ 89% for > 20% of the night OR SpO_2 ≤ 89% for > 10% of the night with evidence of Cor Pulmonale, Pulmonary Hypertension, or Heart Failure, or polycythemia.

Palliative and pediatric clients must still qualify with the above criteria for subsidy.

Infant clients SpO_2 always < 93% sustained continuously for 6 (six) minutes OR as assessed by a pediatric specialist.

Provide oxygen litre flow required maintaining SpO_2 ≥ 90% at rest, and/or on exertion, and/or for nocturnal use.

Appendix D: COPD Flare-up Action Plan

Patient Name: _____ Date: _____

An action plan is a contract between you and your doctor about how you will manage your COPD flare-ups. The goal of this action plan is to quickly detect and treat COPD flare-ups.

Especially watch for a COPD flare-up when:

1. You get a cold or flu.
2. You feel run down or tired.
3. You are exposed to air pollution.
4. After weather changes.
5. When your mood changes; such as feeling down or anxious.

If you have 1 or more of the following symptoms for 1 to 2 days you are having a COPD flare-up:

1. Increased shortness of breath compared to normal.
2. Increased amounts of cough and sputum from normal.
3. Your sputum changes from its normal colour to a yellow, green or rust colour.

YOUR ACTION PLAN

When you have a COPD flare-up, do the following:
(Your doctor will check your action items)

- ☐ Call your family doctor immediately for a check up and medicine
- ☐ Take your prescribed prednisone for a COPD flare-up and finish the prescription
- ☐ Take your prescribed antibiotic for a COPD flare-up and finish the prescription
- ☐ Take 2 - 4 puffs of your blue rescue inhaler, 4 to 6 times per day for shortness of breath
- ☐ Other _____

If after taking the above action, your symptoms do not improve in 48 hours, seek medical care immediately.

If you are extremely breathless, anxious, panicky, confused, agitated, fearful or drowsy, call 911 for an ambulance to take you to the emergency room.

When you have a COPD flare-up

1. Start your action plan as instructed by your doctor.
2. If you do not feel better after 48 hours, or if you are getting worse at any time, get medical attention right away.
3. Book an appointment to see your doctor to get COPD flare-up prescription refills.

This action plan is for COPD flare ups only

There are other reasons you may get shortness of breath such as heart problems or pneumonia. If you develop shortness of breath and symptoms not mentioned on page 1 (abnormal shortness of breath, more cough and sputum, coloured sputum), see a doctor.

Antibiotic Rotation

After a COPD flare-up, a different antibiotic may need to be prescribed for your next flare-up. Help your doctor do this by keeping track of the name of the antibiotic, and when you started taking it for each COPD flare-up.
Bring this information with you to your doctor appointments.

Antibiotic Name				
Date Antibiotic Taken				

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Appendix E: Antibiotic Treatment Recommendations for Acute Exacerbations of COPD (AECOPD)

Antibiotic Treatment Recommendations for Acute COPD Exacerbations		
Category	**Symptoms & Risk Factors**	**Antimicrobial treatment**
Simple COPD No risk factors	Increased dyspnea, increased cough and sputum, sputum purulence • $FEV_1 \geq 50\%$ of predicted • < 4 exacerbations/year	**First Choice (alphabetical)** • amoxicillin • doxycycline • trimethoprim/sulfamethoxazole **Alternate Antibiotics:** • beta-lactam/beta-lactamase inhibitor • extended spectrum macrolides • 2nd or 3rd generation cephalosporins
Complicated COPD Have 1 or more risk factors for treatment failure and/or more virulent or resistant pathogens	Increased dyspnea, increased cough and sputum, sputum purulence **plus at least 1 of the following:** • $FEV_1 < 50\%$ of predicted • ≥ 4 exacerbations/year • ischemic heart disease • use of home oxygen • chronic oral steroid use • antibiotic use in the past 3 months	**First Choice** • antibiotics for uncomplicated patients when combined with oral steroids may suffice • beta-lactam/beta-lactamase inhibitor • fluoroquinolones (newer) **Alternate Antibiotics** May require parental therapy. Consider referral to specialist or hospitalization.
References: CTS COPD Recommendations - highlights for primary care. Can Respir J 2008;15(Suppl A):1A-8A.		

Fluoroquinolone resistance increases with frequent prescriptions. Avoid these medications if prescribed in the previous 3 months (for any indication), and consider an antibiotic from a different class.

CHRONIC OBSTRUCTIVE PULMONARY DISEASE

A Guide for Patients

Effective Date: December 30, 2009

What is Chronic Obstructive Pulmonary Disease (COPD)?
Chronic obstructive pulmonary disease includes chronic bronchitis and emphysema. Smoking is the most important cause of these diseases, although non-smokers can also get COPD. **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 and mucus 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
- sputum and 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 (spirometry and/or pulmonary fuction 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 (if you are still a smoker). Medications may reduce or relieve symptoms; taking them as prescribed is important. Ask your family physician and/or pharmacist to observe and further instruct you on your inhaler technique. Counseling, education, and exercise can help improve quality of life. Pulmonary rehabilitation programs are available in some areas and these have been proven to help.

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 for 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; the helpline staff 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 (1-800-665-5864) for further information including other programs such as Breathworks, the is the Lung Association's national COPD program.

Breathworks offers practical information and support for people with COPD and for their families and caregivers. If you think you might have COPD, if you know you have it, or if you know someone who has it - BreathWorks can help. In addition to information on the website, it offers a free, confidential helpline and free fact sheets and brochures. Free Breathworks COPD Helpline 1-866-717-COPD (2673) *(in Canada)*.

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 wishes for treatment, a living will and a power of attorney. More details related to end of life care can be found at the HealthLinkBC web site at www.HealthLinkBC.ca