

# A multidisciplinary approach to the treatment and management of chronic obstructive pulmonary disease

The family physician plays a pivotal role in the stepwise care of COPD patients, ideally with a team of health professionals, including physiotherapists, respiratory therapists, dietitians, and COPD educators.

**ABSTRACT: Chronic obstructive pulmonary disease (COPD) is common in the elderly, in whom it causes significant morbidity and mortality. The Canadian Thoracic Society recommends a multidisciplinary or team approach to management. Currently, there are significant gaps in managing COPD, which should, like asthma, involve a stepwise approach and include smoking cessation as the pivotal intervention. There is some evidence for the role of long-term inhaled corticosteroids in improving morbidity and mortality in COPD, while the mainstay of therapeutic treatment remains the regular use of bronchodilators (long- and short-acting). Pulmonary rehabilitation, education, self-management, and nutritional advice have all been shown to improve quality of life and to reduce exacerbations and hospitalizations in patients with COPD. For optimal management of COPD, a combination of these strategies and a multidisciplinary team approach involving physicians and several allied health care disciplines are essential.**

**C**hronic obstructive pulmonary disease (COPD) is the only chronic disease with increasing mortality, which may mean that it will be the third leading cause of death worldwide by 2020.<sup>1</sup> A recent study showed that the prevalence of COPD in subjects over 40 years of age in Vancouver is 19.3%, and that in Canada the direct costs of treatment and management are estimated to be \$2 billion a year.<sup>2</sup>

COPD is associated with a significant systemic inflammatory response that results in adverse health effects later in life, such as cardiovascular morbidity and mortality, frailty from malnutrition and muscle weakness, osteoporosis with fractures, and depression. Patients with mild to moderate COPD can be adequately managed in the primary care setting by the family physician, whereas patients with more severe COPD and multiple comorbidities need a multidisciplinary approach to treatment.<sup>3</sup> Currently, there are gaps in care (**Figure**) that could be reduced by ensuring that allied health care workers assist the primary care physician and respirologist in managing more severe cases of COPD (**Table 1**). An ideal stepwise approach would involve family physi-

cians and other health care providers, and would include early diagnosis, pulmonary rehabilitation, education in self-management, nutritional counseling, and appropriate use of bronchodilators.

## Early diagnosis

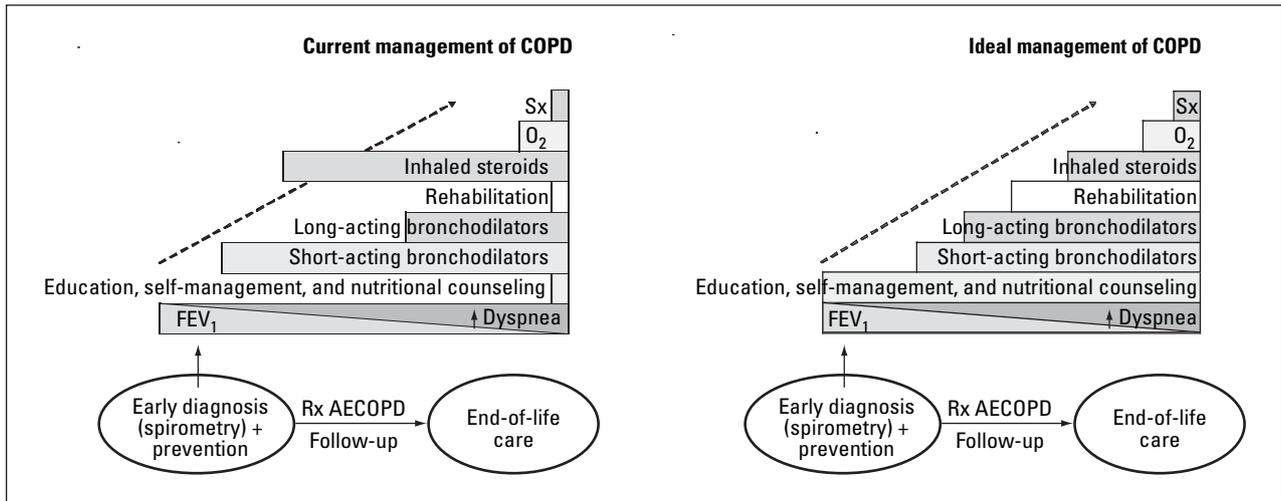
Spirometry is the gold standard for diagnosing COPD and should be performed on all patients over 40 years of age with two or more of the following:

- A history of smoking.
- Chronic cough.
- Shortness of breath.
- Frequent “chest colds.”

Family physicians often rely on symptoms and chest X-rays to make a COPD diagnosis because spirometry services are not available in the community. A recent study in 12 family practice groups demonstrated that spirometry testing can be incorporated into a family medicine practice with acceptable levels of technical

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**Figure.** The depiction of current management of chronic obstructive pulmonary disease highlights gaps in care, particularly in the provision of rehabilitation, education, self-management, and nutritional counseling. The depiction of ideal management shows a stepwise approach that includes all of these elements.

Source: Adapted from Canadian Thoracic Society recommendations<sup>9</sup>

**Table 1. Multidisciplinary management of COPD.**

Stage of COPD*	Characteristics	Management strategies	Service providers
I: Mild	FEV <sub>1</sub> /FVC † < 0.7 and FEV <sub>1</sub> > 80% of predicted with or without symptoms	Spirometry testing Smoking cessation Vaccination Education	Family physician and respiratory therapist  COPD educator
II: Moderate	FEV <sub>1</sub> /FVC † < 0.7 and FEV <sub>1</sub> (50%–80% of predicted)	Short-acting bronchodilators Pulmonary rehabilitation Nutritional advice	Pharmacist Physiotherapist Dietitian
III: Severe	FEV <sub>1</sub> /FVC < 0.7 and FEV <sub>1</sub> 30%–50% of predicted	Long-acting bronchodilators and inhaled corticosteroids	Respirologist
IV: Very severe	FEV <sub>1</sub> /FVC < 0.7 FEV <sub>1</sub> < 31% of predicted or presence of respiratory or right heart failure	Oxygen therapy Surgery End-of-life care	Family physician Thoracic surgeon Social worker and palliative care team

\*According to the Global Initiative for Chronic Obstructive Lung disease<sup>13</sup>  
†FEV<sub>1</sub> (forced expiratory volume in 1 second) to FVC (forced vital capacity).

**Table 2. Smoking cessation programs in BC.**

Quitnow BC Smokers Helpline	1-877-455-2233 www.quitnow.ca
Stop Smoking Before Surgery BC Cancer Agency	www.bccancer.bc.ca
VCH Smoke-Free Premises Policy	www.vch.ca/tobacco

adequacy and accurate interpretations, and that the results influence management of patients previously diagnosed with COPD.<sup>4</sup> Full pulmonary function tests, usually only available in a hospital setting, are important for those with moderate to severe COPD.

### Smoking cessation

Smoking cessation remains the single most important factor in slowing the decline in lung function in patients with COPD. Eliminating this risk factor should be the highest priority in the management of COPD of all severities. In a multidisciplinary COPD clinic at St. Paul's Hospital, smoking cessation was addressed in 76.2% of subjects, compared with 57.5% in a general respiratory clinic setting.<sup>5</sup> Helping patients address this addiction, whether through drug therapy, counseling, or a combination of the two, is key to the prevention and management of COPD. Referral to a structured smoking cessation program or direction to provincial programs is imperative if physician counseling in an office setting is unsuccessful. **Table 2** shows programs available in BC.

**Table 3. Pulmonary rehabilitation programs in BC.**

Facility	Address	Phone/Fax	Program Details	Cost
Cariboo Memorial Hospital	517 N 6th Avenue Williams Lake V2G 2G8	Tel: 250 305-4077 Fax: 250 305-4061	10 weeks Education/exercise	Free
Kelowna General Hospital	2268 Pandosy Street Kelowna V1Y 1T2	Tel: 250 862-4066 Fax: 250 862-4356	10 weeks Education/exercise	Free
Kootenay Boundary Regional Hospital	1200 Hospital Bench Trail Trail V1R 4M1	Tel: 250 364-5136	Information not available	N/A
Lions Gate Hospital	231 East 15th Street North Vancouver V7L 2L7	Tel: 604 984-5752 Fax: 604 984-5809	5 weeks Education/exercise Maintenance program	\$20
Penticton Regional Hospital	550 Carmi Avenue Penticton V2A 3G6	Tel: 250 492-4000 Fax: 250 770-7590	10 weeks Education/exercise	N/A
Prince George Regional Hospital	1475 Edmonton Street Prince George V2M 1S2	Tel: 250 565-2000	12 weeks Education/exercise	Free
Ridge Meadows Hospital	11666 Laity Street Maple Ridge V2X 7G5	Tel: 604 466-5234 Fax: 604 465-0604	8 weeks	Free
Royal Inland Hospital	311 Columbia Street Kamloops V2C 2T1	Tel: 250 314-2514 Fax: 250 314-2188	Education/exercise	\$20 for materials
Royal Columbian Hospital	260 Sherbrooke Street New Westminster V3L 3M2	Tel: 604 523-8800 Fax: 604 523-8801	4.5 weeks Education/exercise	Donations for materials
Royal Jubilee Hospital	1952 Bay Street Victoria V8R 1J8	Tel: 250 370-8667 Fax: 250 370-8267	Information not available	\$30-\$60
Shuswap Lake General Hospital	601-10th Street NE Salmon Arm V1E 4N6	Tel: 250 833-3636 ext 258 Fax: 250 833-3630	Information not available	Free
St. Paul's Hospital	1081 Burrard Street Vancouver V6Z 1Y6	Tel: 604 806-8115 Fax: 604 806-9143	6 weeks Education/exercise	Free
Surrey Memorial Hospital	13750 96th Avenue Surrey V3V 1Z2	Tel: 604 585-5666 ext 2757 Fax: 604 585-5922	6 weeks Education/exercise Maintenance program	Free
Vernon Health Improvement Network	2101-32nd Street Vernon V1T 5L2	Tel: 250 503-3712 Fax: 250 558-4123	8 weeks Education/exercise	\$50
Vancouver General Hospital	910 West 12th Avenue Vancouver V5Z 1L9	Tel: 604 875-4111 local 62857 Fax: 604 875-5695	7 weeks Education/exercise	Free
Vancouver Community Pulmonary Rehab Program	c/o St. Paul's Hospital 8B Providence Wing 1081 Burrard Street Vancouver V6Z 1Y6	Tel: 604 806-9466	6 weeks Education/exercise Maintenance program	\$50 Program \$30 Maintenance

### Pulmonary rehabilitation

Pulmonary rehabilitation, a multidisciplinary and structured intervention for patients with chronic pulmonary diseases, has been shown to improve exercise tolerance, reduce dyspnea, and improve health-related quality of life.<sup>6,7</sup> Pulmonary rehabilitation, combined with education and self-management, has been shown to result in a substantial reduction in

hospital admissions. A recent randomized, controlled trial of a COPD self-management program that included education and exercise instruction showed that hospital admissions for exacerbations were reduced by 39.8% when patients in the study were compared with a control group receiving standard care.<sup>8</sup> Pulmonary rehabilitation also relieves dyspnea and fatigue, the two most debilitating symptoms in

subjects with moderate to severe COPD.<sup>9</sup> Despite the overwhelming evidence of clinical and financial benefits of pulmonary rehabilitation, only a small fraction of Canadian and BC patients qualifying for pulmonary rehabilitation have access to this important mode of management.<sup>10</sup> Most of these programs are institutionally based and offer no form of maintenance exercise after the 6- to

8-week program is completed. The lack of community and home-based programs is currently being addressed, but it remains an important gap in ambulatory COPD management. In more remote regions without easy access to these programs, family physicians need to make simple exercise recommendations such as “walk daily at your own pace, gradually increasing your distance or time walked weekly.” Patients should also be encouraged to utilize oxygen therapy when exercising if required. These simple recommendations will prevent deconditioning. **Table 3** lists pulmonary rehabilitation programs available across BC.

### Education and self-management

Education and self-management are important components of a multidisciplinary approach to management of COPD. Programs for self-management consist of group or one-to-one educational sessions that explain the nature and course of the disease and teach patients how to live with the consequences of the disease and integrate into their community. Self-management involves preparing an “Action Plan” for prompt treatment of acute exacerbations in order to improve quality of life and reduce the use of health care resources. Although patient self-management through an individualized Action Plan can help with early initiation of therapy, its use depends on the patient being able to recognize the features of an exacerbation.<sup>11</sup> Patients reporting fear and anxiety may benefit from psychosocial support, and the integration of occupational therapy or social services support into these programs may improve independence in activity. Family physicians should refer patients to local programs with either peer or professionally led self-management groups.

**Table 4: Stepwise approach to management of COPD**

Stage of COPD	Recommended therapy
All stages	<ul style="list-style-type: none"> <li>• Active reduction of risk factors, especially smoking</li> <li>• Influenza vaccination</li> <li>• Pneumococcal pneumonia vaccination</li> </ul>
I: Mild	<ul style="list-style-type: none"> <li>• Short-acting bronchodilator when needed</li> </ul>
II: Moderate	<ul style="list-style-type: none"> <li>• Short-acting bronchodilator when needed</li> <li>• Add regular treatment with one or more long-acting bronchodilators when needed</li> <li>• Add rehabilitation</li> </ul>
III: Severe	<ul style="list-style-type: none"> <li>• Short-acting bronchodilator when needed</li> <li>• Add regular treatment with one or more long-acting bronchodilators when needed</li> <li>• Add rehabilitation</li> <li>• Add inhaled steroids if exacerbations are frequent</li> </ul>
IV: Very severe	<ul style="list-style-type: none"> <li>• Short-acting bronchodilator when needed</li> <li>• Add regular treatment with one or more long-acting bronchodilators when needed</li> <li>• Add rehabilitation</li> <li>• Add long-term oxygen therapy if chronic respiratory failure is present</li> <li>• Consider surgery</li> <li>• Add inhaled steroids if exacerbations are frequent</li> </ul>

Source: Adapted from Global Strategy for the Diagnosis, Management, and Prevention of Chronic Obstructive Pulmonary Disease.<sup>15</sup>

### Nutritional counseling

Nutritional status is an important determinant of symptoms, disability, and prognosis in COPD. Nutritional intervention should be considered for patients who are underweight, overweight, or have body composition abnormalities. For example, patients with marginal ventilatory reserve might benefit from a dietary regimen in which a high percentage of calories are supplied by fat.<sup>12</sup> In addition, adequate fluids, calories, protein, calcium, and potassium can ease breathing and improve immunity. Adequate hydration can thin respiratory mucus and help prevent drying of the mucous membranes if oxygen is used. Dietary protein is required to maintain good visceral protein status and immune function. Calcium is involved in the regulation of blood pressure, muscle contraction, and maintenance of healthy bones. Normal serum potassium levels are beneficial for muscle contraction to aid breathing. All COPD patients should maintain a healthy weight and obtain adequate

nutrients to decrease risk of infection and ease breathing.

### Bronchodilators

Inhaled bronchodilators ( $\beta_2$  agonists and anticholinergic agents) are the preferred option for symptomatic management in stable COPD, either for regular treatment or for use on an as-needed basis.<sup>13</sup> Recent evidence showed that long-acting  $\beta_2$  agonists and anticholinergic agents improve compliance and are more efficacious than their shorter-acting equivalents. Although inhaled corticosteroids do not affect declines in FEV<sub>1</sub>, they do reduce the exacerbation rate in patients with moderate to severe COPD, and there is some evidence for their role in reducing overall mortality.<sup>14</sup> Patients who have difficulty mastering inhaler technique with the metered-dose inhaler should use a spacer with the device. Different types of spacers and inhaler devices should be experimented with in an attempt to identify a device that the patient can use easily and effectively. As with

inhaler technique, patients require training in how to use a spacer effectively. This approach is more convenient than recommending treatment with a nebulizer.

### End-of-life care

The family physician has an important role to play in discussing end-of-life care and addressing the patient's concerns and fears. This discussion should not be left until the patient is moribund. A discussion of advanced care issues, including the use of biPAP and mechanical ventilation, is a vital component of overall management.

### Summary

Multidisciplinary team programs are available to assist family physicians in Vancouver (St. Paul's Hospital, Royal Columbian Hospital, Vancouver General Hospital, and Richmond Hospital) and Kelowna. These programs can help physicians provide stepwise management of COPD at all stages of severity, as summarized in **Table 4**. In this approach, the family physician is the pivotal health care provider at all stages of the disease and ensures that the patient has access to the following:

- Spirometry testing. Spirometry is essential for both diagnosis and for determining the severity of disease.
- Patient education: A respiratory therapist, either in the community or at a regional hospital, can assist with inhaler device technique and smoking cessation. A self-management program can help patients develop an Action Plan and learn to live with their disease.
- Pulmonary rehabilitation. Patients should be referred to a pulmonary rehabilitation program or, alternatively, a healthy heart program. If there are no programs available, physicians should encourage their patients to walk every day at their

own pace, gradually increasing their distance or time walked per week. Patients should be advised to utilize oxygen therapy when exercising if required. A physiotherapist can also assist with a home exercise program to build strength and help with overall conditioning.

- Nutritional advice. Nutritional intervention should be considered for patients who are underweight or overweight.
- End-of-life care. The family physician should discuss end-of-life and palliative care issues with their patients or provide them with materials about advanced care planning.

### Competing interests

The Pacific Lung Health Centre's COPD program is part of the PRIISME chronic disease management program supported by GlaxoSmithKline.

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