Chronic obstructive pulmonary disease
Family physicians’ role in management

Alan Kaplan, MD, CCFP(EM)

With the release of new Canadian Chronic Obstructive Pulmonary Disease (COPD) Guidelines, I thought it would be helpful to describe family physicians’ role in office management of this common disease. The guidelines can be found in their entirety at http://www.pulsus.com/Respir/10_SA/supp_A_master.pdf.

The prevalence of COPD is increasing. It is currently the fifth most common cause of death; by 2020, it will rise to third. It is a frequent cause of disability and lost years of productivity. The largest costs incurred in COPD are for hospital admissions and emergency care. Family physicians can intervene in this disease to reduce morbidity and effectively manage care.

Definition
Chronic obstructive pulmonary disease is a respiratory disorder, largely caused by smoking, that is characterized by progressive, partially reversible airway obstruction, systemic manifestations, and exacerbations that increase in frequency and severity.

Screening
Family physicians are well situated to identify and diagnose COPD. Screening smokers has been proven effective. If physicians could identify the smokers at highest risk of COPD, those who are rapidly losing lung function (thought to be about 20% of smokers who smoke 20 packs a year), and get them to stop smoking, huge costs would be avoided. Smoking cessation at any age will benefit patients, however (Figure 1), and is the only intervention that has been proven to delay or halt progression of COPD.

Figure 1. Effects of smoking and stopping smoking on forced expiratory volume in 1 second (FEV1)
Diagnosis of COPD is made through spirometry. Diagnosis requires a postbronchodilator FEV\textsubscript{1}/FVC of <0.7 and a FEV\textsubscript{1} predicted at <80%. A 30-second COPD test has been developed by researchers in Ottawa, Ont. If patients answer yes to the following five questions, they likely have COPD.

- Do you smoke currently or have you smoked cigarettes?
- Do you cough regularly?
- Do you bring up mucus regularly?
- Do even simple chores make you breathless?
- Do you get frequent colds that persist longer than those of other people you know?

Goals of management

Canada’s new COPD guidelines\textsuperscript{3,4} aim:

- to prevent disease progression (smoking cessation),
- to alleviate breathlessness and other respiratory symptoms,
- to improve exercise tolerance,
- to prevent and treat exacerbations,
- to improve health status, and
- to reduce mortality.

Assessing severity

Severity of COPD can be assessed on a symptom scale or by measuring lung function. Figure 2 shows the Medical Research Council’s dyspnea scale\textsuperscript{5} that classifies severity based on patients’ symptoms. This scale is user-friendly for family physicians. Previous guidelines classified disease based on spirometric measurements of lung function alone. Table 1\textsuperscript{4} shows classification of COPD by symptoms and disability.

Pharmacologic therapy

Therapy depends on symptoms and disease severity. Begin with short-acting bronchodilators (such as salbutamol, terbutaline, ipratropium, or a salbutamol-ipratropium combination) as needed, but once they are being used regularly, add long-acting bronchodilators (Figure 3\textsuperscript{4}). Tiotropium (a long-acting anticholinergic drug) and long-acting $\beta_2$-agonists, such as salmeterol or formoterol, are current choices. Inhaled corticosteroids are indicated if patients respond well to steroids or have poor lung function and have frequent exacerbations.

**Table 1. Classification of chronic obstructive pulmonary disease (COPD) by symptoms and signs**

<table>
<thead>
<tr>
<th>STAGE OF DISEASE</th>
<th>SYMPTOMS AND SIGNS</th>
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<tr>
<td>At risk*</td>
<td>Asymptomatic smoker, former smoker, chronic cough and sputum with postbronchodilator FEV\textsubscript{1}/FVC of $\geq0.7$ or FEV\textsubscript{1} 80% predicted</td>
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<tr>
<td>Mild</td>
<td>Shortness of breath from COPD with strenuous exercise, when hurrying on level ground, or when walking up a slight hill (Grade 1-2)</td>
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<tr>
<td>Moderate</td>
<td>Shortness of breath from COPD causing patient to walk slower than people of same age on level ground or stop after walking about 1000 m (or after a few minutes) on level ground (Grade 3-4)</td>
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<tr>
<td>Severe</td>
<td>Shortness of breath from COPD leaving patient too breathless to leave the house or breathless after dressing or undressing (Grade 5), chronic respiratory failure, or clinical signs of right heart failure</td>
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FEV\textsubscript{1}—forced expiratory volume in 1 sec, FVC—forced vital capacity

*Patient does not yet fulfill criteria for diagnosis of COPD.

Adapted from O’Donnell et al.\textsuperscript{4}
Patients who respond to steroid therapy

Patients with continuing symptoms, who are not smoking and are optimally treated with bronchodilators, can be challenged with either 30-mg/d of prednisone for 2 weeks or 500 µg of fluticasone or equivalent twice daily for 3 months. If repeat FEV₁ testing shows a 20% improvement with at least 180 mL, patients are defined as steroid responders. The ISOLDE⁶ trial showed that people with moderate-to-severe COPD who used 500 µg of fluticasone twice daily had fewer and milder exacerbations. Thus, physicians can consider adding inhaled steroids to the daily regimen of patients with moderate-to-severe COPD and recurrent exacerbations, even if they do not respond to steroids.

Nonpharmacologic therapy

Nutrition. Patients who are undernourished have a much poorer prognosis with COPD. They have less muscle mass, less ability to clear secretions, and less resistance to exacerbations than well nourished people. They have been working so hard to breathe they have depleted their reserves. Nutritional supplements and sufficient protein intake will help these patients.

Pulmonary rehabilitation. Formalized therapy has been shown to:
- improve and maintain skeletal and respiratory muscles,
- increase endurance during exertion,
- lessen dyspnea,
- aid in clearance of secretions
- decrease hospitalizations during exacerbations, and
- encourage patients to stay active mentally and physically.
Even if there are no formal programs in your area, exercise and muscle training have these benefits.

Surgery. Surgical treatments for severe disease, such as lung transplants and lung reduction surgery, have been used with some success. The justification is that, because large bullae might not allow the rest of the lung to expand and function properly, removing the bullae will improve the function of the rest of the lung.

Oxygen

The only thing that has been shown to decrease mortality in COPD is long-term oxygen therapy. Level I, grade A support for domiciliary oxygen is administration 15 hours or more daily to achieve oxygen saturation of ≥90% for stable COPD patients with severe hypoxemia (PaO₂ ≤55 mm Hg) or for patients with hypoxia at PaO₂ ≤60 mm Hg plus ankle edema and cor pulmonale or hematocrit at ≥56%.

Prevention and treatment of exacerbations

Inhaled steroids and tiotropium have been shown to decrease...
exacerbations. Influenza and pneumococcal vaccination are also key strategies in prevention of exacerbations.

Once an exacerbation occurs, administer antibiotics. If patients have increased sputum, sputum purulence, and fever with increased shortness of breath, they likely have a bacterial infection. Choice of antibiotic depends on severity of illness, comorbidities, and antibiotic exposure. Physicians should increase bronchodilator dosage, assess oxygenation, and prescribe a short course of systemic steroids for all but the mildest exacerbations.

Conclusion
Suspect COPD, screen for it with spirometry, and make the diagnosis. Early diagnosis can markedly change prognosis, quality of life, and outcome. Increase your efforts to get patients to stop smoking. Ensure patients have adequate immunization, nutrition, and rehabilitation. Medication can help; treatment regimens are more effective with long-acting bronchodilators. Family physicians are the cornerstone of the Canadian health care system; we can make a difference for patients with COPD.

Dr Kaplan is a family physician and emergency physician in Richmond Hill, Ont. He is Chair of the Family Physician Airways Group of Canada (FPAGC). Information on the FPAGC can be found on their website at http://www.fpagc.com/.

References