

The COPD Action Plan

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Acute exacerbation of chronic obstructive pulmonary disease (COPD) is the most common cause of medical visits, hospital admissions, and death among patients with COPD.¹ Frequent exacerbations result in accelerated decline in lung function.¹ It is therefore vital that COPD be treated appropriately, prevention strategies adopted, and exacerbations identified and treated early.

The 2008 Canadian Thoracic Society (CTS) COPD update defines *acute exacerbations of chronic obstructive pulmonary disease* (AECOPD) as sustained (≥ 48 hours) worsening of dyspnea, cough, or sputum production leading to increased use of maintenance medications or supplementation with additional medications.¹ Patients with COPD experience approximately 2 exacerbations per year on average, but the rate is highly variable. Patients reporting exacerbations earlier have more hospital emergency visits and experience decreased quality of life.²

Strategies for prevention of AECOPD as recommended by the 2008 CTS COPD update include the following:

- smoking cessation,
- annual influenza vaccination,
- pneumococcal vaccination every 5 to 10 years,
- self-management education,
- regular long-acting bronchodilator therapy for moderate to severe COPD,
- regular therapy with an inhaled corticosteroid and long-acting β -agonist combination for moderate to severe COPD with an average of at least 1 AECOPD per year,
- oral corticosteroid therapy for AECOPD, and
- pulmonary rehabilitation.

Self-management

Self-management education holds promise for positive economic benefits in the context of increased patient case-loads and rising costs of hospitalization.³ In Canada, with occasionally limited access to specialist care and sometimes great distances between centres, self-management education is an important component of health care improvement programs. By reviewing and incorporating current best practice into standardized patient self-management tools and resources, general practitioners can contribute to progress in evaluation and ensure tools are designed to reflect the realities of practice.

The Canadian Respiratory Guideline Consortium struck a committee to create and refine currently available action plans for use in primary care. Such plans comprise written information with specific instructions about management when symptoms deteriorate. Studies investigating effects of written self-management plans

for COPD patients showed several positive effects.^{4,5} Authors of a New Zealand study of a nationally adopted COPD action plan in primary care concluded that patients who had plans reported increases in early intervention with oral corticosteroids and antibiotics and more confidence in their self-management ability.⁶ European studies report that using action plans during consultations resulted in overall improvement in patient-GP communication.⁷ A Cochrane review⁸ showed that action plans helped people with COPD to recognize and react appropriately to exacerbations through self-initiation of antibiotics or steroids; and work in Canada by Bourbeau and colleagues has shown improved morbidity and mortality.³ Bourbeau's work includes an excellent detailed action plan administered in COPD clinics by trained educators and nurses who are then available for telephone follow-up and to give advice (www.livingwellwithcopd.com). This has been shown to decrease severity of exacerbations, hospitalizations, and the cost of health care for those with COPD.³ In its current form, however, the plan is not applicable in primary care owing to its length.

Action plan

A short COPD Action Plan was created by Family Physician Airways Group of Canada executive members, and a validation trial is currently under way. Two respirologists and 2 family physicians worked on adapting existing tools into the new COPD Action Plan, which is available on **CFPlus**,* at the CTS website, www.copd-guidelines.ca, or at the Family Physician Airways Group website, www.fpagc.com.

This plan is a 2-sided sheet with 3 copies: 1 for the patient, 1 for the physician, and 1 for the pharmacist. The copy for the pharmacist also acts as a prescription. The forms have been colour-coded into green, yellow, and red zones (modeled after the Asthma Action Plan). The green zone describes the patient's normal situation. In asthma we aim for no symptoms, but in COPD regular symptoms are normal for people with persistent airway obstruction.

The yellow zone is for times of change, when symptoms worsen, including dyspnea and changes in sputum colour and quantity. Although more than half of AECOPD cases are caused by infection (many are initially viral), additional triggers include exposure to allergens and irritants. Other causes, such as congestive heart failure and pulmonary embolism, will require different management.



*The COPD Action Plan is available at www.cfp.ca. Go to the full text of this article on-line, then click on CFPlus in the menu at the top right-hand side of the page.

The yellow zone contains advice to use routine COPD medications, to use breathing exercises and relaxation techniques, to change the environment if it is causing the flare-up, and to increase oxygen. If the exacerbation is infective and the dyspnea is accompanied by increased or coloured sputum, antibiotics and systemic steroids are suggested. If the condition worsens, patients are advised to visit their physicians or the emergency department. Follow-up with their physicians after the attack is also recommended.

The back of each copy provides instructions as well. The patient copy has instructions about what AECOPD means and explains that rapid identification and action are helpful. The back of the physician and pharmacist copies include current guideline advice for choice of appropriate antibiotics. Further advice includes reminders to adjust antibiotic therapy to decrease antibiotic resistance if exacerbations occur within 3 months and to use preventative strategies, including influenza and pneumococcal vaccination and appropriate pharmacotherapy.

Treatment choices

Patients with COPD do not have a lot of respiratory reserve. As such, the initial choice of antibiotic is important, as patients often end up in the emergency department (or worse) if symptoms do not improve. Antibiotic choice is based on which organisms are likely to be colonizing patients' airways. In those with reasonable lung function (forced expiratory volume in 1 second >50%) and 3 or fewer exacerbations per year, the likely organisms include *Streptococcus pneumoniae*, *Moraxella catarrhalis*, and *Haemophilus influenzae*. First-line antibiotics are appropriate for these patients. In those with more severe reduction in lung function, more frequent exacerbations, and numerous comorbidities, the presence of other bacteria, including Gram-positive and Gram-negative β -lactam-resistant bacteria, is more likely; respiratory fluoroquinolones or amoxicillin-clavulanate are appropriate. For those with chronic suppurative disease (eg, bronchiectasis), the presence of other organisms such as *Pseudomonas aeruginosa* and resistant Enterobacteriaceae entail treatment with ciprofloxacin or parenteral agents.

In addition to antibiotics, inhaled bronchodilators (combinations of short-acting β_2 -agonist and anticholinergic inhaled therapies) are indicated to improve lung function and dyspnea symptoms. Oral or parenteral corticosteroids are indicated in most patients with moderate to severe AECOPD. Treatment for 7 to 14 days is recommended, with dose and duration individualized so that patients receive the lowest effective dose. Recommended doses are 25 to 50 mg daily of prednisone or equivalent in patients with moderate to severe COPD.


Hospitalizations account for more than 50% of the total direct cost of COPD,⁹ and short-acting β -agonists are responsible for 49% to 55% of the cost of all inhalers.¹⁰ Long-acting bronchodilators are associated

with substantially lower rates of hospitalization (and therefore lower total cost) than short-acting agents are. Clearly prevention of exacerbations and early intervention have huge cost implications.

Barriers to use

Despite the clear benefits of the COPD Action Plan, there are certainly barriers to its use. Physicians need time to teach patients, to review patients' use of the plans, and to ensure that antibiotics are appropriately prescribed. Systemic steroids do have side effects, and the risk-benefit ratio must be reviewed in the context of patients' other diseases. Providing only a single repeat on medications helps to ensure follow-up appointments occur. Support resources include the BreathWorks program, Certified Respiratory Educators, and the Lung Association.

Longitudinal research examining self-management behaviour in response to exacerbations in a larger population is needed to improve this tool. Further improvements will occur after the validation studies are complete, and we are working on creating an interactive electronic version for inclusion in electronic medical records.

Early identification and treatment of AECOPD improves outcomes for patients and reduces the costs associated with COPD. The COPD Action Plan provides patients and primary care providers with a tool to facilitate management of these exacerbations when they occur. 

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Competing interests

Dr Kaplan has been on advisory boards, helped to create continuing medical education programs, or given presentations for Abbott, Boehringer Ingelheim, GlaxoSmithKline, Merck Frosst, Nycomed, Pfizer, Purdue, and Talecris. He is a member of the Health Canada Section on Allergy and Respiratory Therapeutics Committee.

References

- O'Donnell DE, Hernandez P, Kaplan A, Aaron S, Bourbeau J, Marciniuk D, et al. Canadian Thoracic Society recommendations for management of chronic obstructive pulmonary disease—2008 update—highlights for primary care. *Can Respir J* 2008;15(Suppl A):1A-8A.
- Wilkinson TM, Donaldson GC, Hurst JR, Seemungal TA, Wedzicha JA. Early therapy improves outcomes of exacerbations of chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2004;169(12):1298-303.
- Bourbeau J, Collet JP, Schwartzman K, Ducruet T, Nault D, Bradley C. Economic benefits of self-management education in COPD. *Chest* 2006;130(6):1704-11.
- Eiffing T, Monnikhof EM, van der Valk PD, et al. Self-management education for patients with chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2007;(4):CD002990.
- Watson PB, Town GI, Holbrook N, Dwan C, Toop LJ, Drennen CJ. Evaluation of a self-management plan for chronic obstructive pulmonary disease. *Eur Respir J* 1997;10(6):1267-71.
- Dowson C, Town I, Frampton C, Mulder R. Psychopathology and illness beliefs influence COPD self-management. *J Psychosom Res* 2004;56(3):333-40.
- De Ridder T, Theunissen N, van Dulmen S. Does training general practitioners to elicit patients' illness representations and action plans influence their communication as a whole? *Patient Educ Couns* 2007;66(3):327-36. Epub 2007 Mar 6.
- Turnock AC, Walters EH, Walters JAE, Wood-Baker R. Action plans for chronic obstructive pulmonary disease. *Cochrane Database Syst Rev* 2005;(4):CD005074.
- Nederman MS, McCombs JS, Unger AN, Kumar A, Popovian R. The cost of treating acute exacerbations of chronic bronchitis. *Clin Ther* 1999;21(3):576-91.
- Marton JP, Boulanger L, Friedman M, Dixon D, Wilson J, Menzin J. Assessing the costs of chronic obstructive pulmonary disease: the state medicare perspective. *Respir Med* 2006;100(6):996-1005. Epub 2005 Nov 8.

For more information on the COPD Action Plan or for ordering triplicate copies, please go to www.copdguidelines.ca.