



Julia Walters

# COPD

## Diagnosis, management and the role of the GP

### Background

Chronic obstructive pulmonary disease (COPD) is a common condition characterised by breathlessness, cough and sputum production. However these are nonspecific, common symptoms which may be misattributed; resulting in a possible underdiagnosis of COPD.

### Objective

To outline the current views on COPD diagnosis and management with a focus on the role of the general practitioner.

### Discussion

An initial important step is to consider and confirm the diagnosis of COPD. Management of COPD focuses on optimising function, preventing deterioration, developing support networks and self management, and managing exacerbations.

**Keywords:** respiratory tract diseases, pulmonary disease, chronic obstructive, chronic disease/therapy



Health professionals in primary care are generally the first point of contact for people with symptoms of chronic respiratory conditions.<sup>1</sup> Although the main symptoms of chronic obstructive pulmonary disease (COPD) are breathlessness, cough and sputum production,<sup>2</sup> these are nonspecific and of gradual onset outside exacerbations, and frequently reported by individuals with normal spirometry.<sup>3</sup> Symptoms may be attributed by patients to aging or lack of fitness; doctors may attribute them to acute respiratory infections and fail to seek an underlying diagnosis;<sup>4</sup> and negative attitudes to treatment of COPD may deter doctors from making a diagnosis.<sup>5</sup> These factors contribute to considerable underdiagnosis of COPD, delayed diagnosis with disease progression, and missed opportunities for preventing further deterioration.<sup>2</sup> However, there is good evidence that a range of pharmacological and nonpharmacological interventions are effective in improving symptoms, improving quality of life, and reducing the frequency and impact of exacerbations. Summaries of regularly updated recommendations accompanied by grading of the supporting evidence now exist to guide diagnosis and management of COPD.<sup>6-8</sup>

### Confirming the diagnosis of COPD

A diagnosis of COPD should always be actively considered in those with a history of exposure to risk factors, principally cigarette smoking. Symptoms suggestive of COPD include dyspnoea, chronic cough or sputum production.<sup>6-8</sup> Around half of all smokers develop some airflow limitation, and 15–20% will develop clinically significant disability,<sup>9</sup> with a close relationship existing between the amount of tobacco smoked and the rate of decline of lung function.<sup>10</sup> Chronic obstructive pulmonary disease can also occur in nonsmokers. Risk factors include asthma, passive smoking, indoor and outdoor air pollution, and occupational exposures, with women at increased risk.<sup>9</sup> Use of a checklist such as that derived from the Australian COPD-X guidelines (see *Resources*) assists structured history taking and systematic recording of smoking history and willingness to quit, although confirmation of the diagnosis is based on spirometry.<sup>11</sup>



Spirometric tests require high levels of subject effort and cooperation, and it is important that quality testing criteria are met.<sup>12</sup> Ability to meet these criteria will influence the effectiveness of general practice testing.<sup>13</sup> The value of case finding with spirometry in at risk populations<sup>11</sup> has not been demonstrated and alternative methods for limited rapid assessment of obstruction using expiratory flow meters are yet to be evaluated.<sup>14</sup>

Chronic obstructive pulmonary disease is characterised by airflow limitation that is not fully reversible after administration of bronchodilator medication, with the ratio of forced expiratory flow in 1 second (FEV<sub>1</sub>) to forced vital capacity (FVC) remaining <0.7 and the FEV<sub>1</sub> <80% of the predicted value. Predicted values are obtained from healthy population studies, derived from formulas based on height, age, gender and ethnicity. Spirometry is used to grade the severity of COPD and to differentiate from asthma in which airflow limitation is fully or substantially reversible,<sup>6</sup> although there is overlap with asthmatics having a COPD element, especially if they smoke.<sup>15</sup>

## Management of COPD

Management of a chronic illness such as COPD must include both anticipatory proactive care in addition to acute reactive care,<sup>16</sup> and should address four components:

- optimising function
- preventing deterioration
- developing support networks and self management skills, and
- managing exacerbations.<sup>6</sup>

### Optimising function

Pharmacologic treatment can prevent and control symptoms, reduce the frequency and severity of exacerbations, improve health status, and improve exercise tolerance, although there is no evidence of long term benefit for any pharmacotherapy on the rate of decline in lung function. Choice of therapy should be guided by disease severity and impact and reviewed regularly to assess benefit and inhaler technique (Table 1).<sup>6</sup> However, it is difficult in practice to quickly assess the impact of COPD in an individual, not only on symptoms but on activity limitation, sleep and general wellbeing, which may be significantly compromised. Impairment in these areas is often not appreciated by health professionals<sup>17</sup> and in a promising development, a validated eight item health status assessment test<sup>18</sup> may assist clinicians to identify key areas of impairment and personalise and optimise management.<sup>6</sup>

A range of nonpharmacological treatments are effective in COPD,<sup>6</sup> including pulmonary rehabilitation which reduces symptoms, disability and hospitalisation and improves function.<sup>19</sup> Access to comprehensive programs comprising patient assessment, exercise training, education, nutritional intervention and psychosocial support may be limited by resources and location, or by individual preference. One example of an alternative format available in Australia is the Stanford Chronic Disease Self Management program whose effectiveness in COPD is currently being studied.<sup>14</sup>

## Preventing deterioration

Only complete cessation of smoking slows decline in lung function in COPD.<sup>20</sup> Even a brief, 3 minute period of counselling urging a smoker to quit can be effective, and at a minimum should be done at every health care provider visit.<sup>8</sup> People who continue to smoke despite having pulmonary disease are highly nicotine dependent and need more intensive strategies such as nicotine replacement therapies, the antidepressant bupropion or the nicotine receptor partial agonist varenicline, which increase the likelihood of sustained quitting.<sup>21</sup> Successful quitting can be promoted by personalising cessation advice based on lung function results.<sup>22,23</sup>

Annual influenza vaccination should be given to reduce the risk of exacerbations, hospitalisation and death,<sup>24</sup> and pneumococcal vaccination should be given as it is effective in preventing pneumococcal pneumonia, although there is no direct evidence of its efficacy in preventing pneumococcal exacerbations of COPD.<sup>25</sup>

Long term low flow oxygen therapy (LTOT) (more than 15 hours/day generally around 2 L/min) prolongs life in stable patients with hypoxaemia (PaO<sub>2</sub> <55 mmHg) or in patients with milder hypoxaemia (PaO<sub>2</sub> 55–59 mmHg) with evidence of pulmonary hypertension.<sup>6</sup> State or regional health departments in Australia and New Zealand will subsidise LTOT if the patient meets the specified criteria, has ceased smoking for at least 1 month, and an approved provider treats potentially reversible factors and prescribes LTOT.<sup>14</sup>

## Developing support networks and self management

Integrated COPD care teams in primary care, which combine recall, spirometry, education and counselling, improve treatment and prevention, and reduce exacerbations.<sup>26</sup> Case management for patients with more severe disease in outreach specialist care can prevent hospitalisation.<sup>27</sup> Local patient support groups offering education, psychosocial support and carer support are highly regarded by patients and can be accessed via national organisations such as the Australian Lung Foundation (see *Resources*).

Many patients with end stage COPD wish to participate in end-of-life management decisions. These discussions should not be left too late in the disease course and may need input from a respiratory physician. However, the general practitioner often knows the patient well and has an important role in broaching the topic.<sup>14</sup> In addition to covering specific treatment choices, for example intubation and admission to an intensive care unit (ICU) and other medical matters, discussion could cover financial matters and the options of Enduring Power of Attorney or Advance Health Care Directives.

## Managing exacerbations

Symptoms and lung function only recover slowly after an exacerbation. Patients experiencing frequent exacerbations have significantly worse health related quality of life, more rapid lung function decline<sup>28</sup> and experience increased mortality risk.<sup>29</sup>

Early diagnosis and prompt management of exacerbations of COPD

**Table 1. Pharmacological therapy in stable COPD – optimising function according to disease severity and impacts<sup>2</sup>**

	COPD – mild	COPD – moderate	COPD – severe
Spirometry: FEV <sub>1</sub> postbronchodilator	60–80% predicted	40–59% predicted	<40% predicted
Functional assessment: activities of daily living (ADLs)	Breathless on moderate exertion, may be few symptoms or effects on ADLs	Increasing dyspnoea, breathless on the flat, increasing limitation of ADLs	Dyspnoea on minimal exertion, ADLs severely curtailed
Symptomatic bronchodilator use	Short acting bronchodilator salbutamol and/or ipratropium used when needed		
Regular bronchodilator use	Long acting beta-2 agonist added when frequent deterioration in symptoms prompts additional medication use		
Regular bronchodilator use		Long acting anticholinergic tiotropium 18 µg once daily	
Regular bronchodilator use combined with inhaled glucocorticosteroids		Fluticasone propionate with salmeterol xinafoate, 125/25 µg or 250/25 µg two inhalations twice daily (FEV <sub>1</sub> <50% predicted)	
Oral slow release theophylline	May be useful after trial of short and long acting bronchodilators or where no inhaler use is possible. Narrow therapeutic index requires monitoring of plasma levels and potential interactions		

may prevent progressive functional deterioration and reduce hospital admissions.<sup>30</sup> Education of patients, carers and family may aid in the early recognition of exacerbations. Self management action plans developed in conjunction with the GP and specialist that indicate how to step up treatment and improve knowledge of appropriate responses to deterioration may be useful (see *Resources*).<sup>31</sup>

Most patients with an exacerbation of COPD can be managed at home, with GP care, or in some areas, with the assistance of hospital outreach schemes, resulting in considerable savings in COPD health care costs.<sup>32</sup> Hospital treatment may be required because of the severity of the exacerbation, especially with hypoxaemia or confusion, requirement for therapies not available at home (eg. oxygen or nebulised bronchodilators), or the need for specialist interventions such as noninvasive ventilation. The decision about referral to hospital involves an assessment of the severity of symptoms (degree of breathlessness, presence of cyanosis or peripheral oedema and level of consciousness), the presence of comorbidities and LTOT use, the level of physical functioning, and the ability to cope at home.<sup>32</sup>

Short acting beta-2 agonists should be used at a dose high enough to relieve breathlessness. Salbutamol eight puffs 2–3 hourly may be given, with anticholinergics in severe cases, using a spacer with metered dose inhaler (MDI), which is as effective as a nebuliser and more convenient.<sup>32,33</sup>

Bacteria can be isolated from sputum during periods of stability but are particularly associated with exacerbations. Antibiotic therapy should be instituted based on increased sputum purulence and/or volume. Regardless of antibiotic choice, treatment reduces mortality and treatment failure in exacerbations in patients who are moderately or severely ill.<sup>34</sup> Bacteria isolated during exacerbations are generally sensitive to most broad spectrum antibiotics. Australian guidelines recommend the use of oral agents such as doxycycline or amoxicillin,

and amoxicillin-clavulanate for patients who do not respond or if resistant organisms are suspected.<sup>14</sup> Oral corticosteroids (prednisolone 30–50 mg orally, 7–14 days without tapering) should be prescribed to patients who have an exacerbation with a significant increase in breathlessness in the absence of significant contraindications.<sup>32</sup> Treatment is associated with significantly fewer treatment failures but an increase in short term side effects.<sup>35</sup>

Appropriate specialist referral may be required in more severe exacerbations to prevent further deterioration. Controlled oxygen delivery (28%, or 0.5–2.0 L/min) is indicated if there is hypoxaemia, titrated against oxygen saturation (88–92%) and avoiding high flow delivery. Support with assisted mechanical ventilation is required for patients with:

- persistent or worsening hypoxaemia despite supplemental oxygen
- worsening hypercapnia (PaCO<sub>2</sub> >70 mmHg) with severe or worsening respiratory acidosis (blood pH <7.3).

Linking acute care after discharge from hospital to ongoing care in the community may be facilitated by developing a discharge care plan, involving the patient's GP in a case conference, and the role of telephone follow up as a way of systematically extending support to patients and increasing their coping strategies at home is promising.<sup>27,36</sup>

### Summary of important points

- There is considerable underdiagnosis of COPD.
- Spirometry can be helpful in diagnosis.
- Disease severity can guide appropriate management.
- The key steps in management can be summarised to: optimising function, preventing deterioration, developing support networks and self management, and managing exacerbations.
- Advice and assistance with smoking cessation should be offered at every health care contact.



## Resources

- Australian COPD-X guidelines: [www.copdx.org.au/checklist/index.asp](http://www.copdx.org.au/checklist/index.asp)
- Australian Lung Foundation: [www.lungfoundation.com.au](http://www.lungfoundation.com.au)
- The Australian and New Zealand COPD reference site. Self management action plans: [www.copdx.org.au](http://www.copdx.org.au).

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