Chronic bronchitis: think COPD

When patients, particularly cigarette smokers, present with chronic respiratory symptoms, consider chronic obstructive pulmonary disease (COPD). Since a diagnosis of COPD can impact significantly on the likelihood of a smoker quitting smoking, early diagnosis is important.

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Chronic bronchitis is characterised clinically as cough productive of sputum for more than three months in a year for at least two successive years in a patient in whom other causes of chronic cough (e.g. bronchiectasis or tuberculosis) have been excluded.[1] Patients with chronic bronchitis have increased numbers of mucous producing glands in their bronchial tree. It is the excess mucus produced by these glands, as well as other chronic inflammatory changes, that contributes to the cough and mucus expectoration.

Chronic bronchitis may or may not be associated with airflow obstruction (reduced FEV_1/VC on spirometric testing). In the presence of airflow obstruction, the condition is part of the spectrum of conditions known as COPD.

COPD is the most common chronic lung disease in the world and one of the few diseases in our community that is increasing in prevalence; however, as many as 50% of patients with this disease remain undiagnosed and untreated.

GPs are in an ideal position to diagnose and manage COPD. A diagnosis of COPD should be considered in all patients who have a risk factor (usually smoking) and present with chronic respiratory symptoms of exertional breathlessness, chronic cough, regular sputum production, frequent winter 'bronchitis' or wheeze.

COPD and its risk factors

COPD is defined as 'a disease state characterised by airflow limitation that is not fully reversible. The airflow obstruction is usually both progressive and associated with an abnormal inflammatory response of the lungs to noxious particles or gases'.[2] Components of COPD that may co-exist

IN SUMMARY

- **Patients presenting with chronic bronchitis provide an opportunity for GPs to identify smokers or ex-smokers who are at risk of developing COPD.**
- **Demonstrating airflow obstruction is central to the diagnosis of COPD; spirometry is the only simple, accurate method of measuring airflow obstruction in these patients.**
- **Smoking is the most important risk factor for developing COPD, and smoking cessation is the only effective means of slowing the accelerated decline in FEV_1 caused by the disease.**
- **Knowledge of a diagnosis of COPD has been shown to influence patients to stop smoking; thus early diagnosis is important.**
- **For symptomatic patients, short and long acting bronchodilators can be useful; other treatment options for moderate to severe COPD and persistent symptoms include inhaled corticosteroids and pulmonary rehabilitation.**

with chronic bronchitis include:

- emphysema
- small airways disease (obstructive bronchiolitis)
- possibly, chronic asthma with only partial reversibility.

Smoking is the major risk factor for developing COPD, contributing about 85% of the risk. Other exogenous irritants that have been implicated as causes of chronic bronchitis include coal, isocyanates, silica, cadmium and a range of other dusts.

Diagnosing COPD

Although patients with 'simple chronic bronchitis' may have relatively well preserved lung function, the presentation of patients with chronic bronchitis provides GPs with an opportunity to identify smokers or ex-smokers at risk of developing significant COPD. Not all patients who will develop significant airflow obstruction have symptoms of chronic bronchitis. These patients may simply present with increasing breathlessness, often wrongly attributed to lack of fitness or ageing.

If a patient with an appropriate history has associated shortness of breath, spirometry is indicated to confirm airflow obstruction and to determine whether this is reversible (Figure). Although the place of spirometry as a screening test for all people who smoke is controversial and of unproven benefit, targeted spirometry in a symptomatic individual is fundamental to diagnosing COPD.

Besides COPD, the differential diagnoses of cough, sputum and shortness of breath include asthma, nonobstructive pulmonary diseases and cardiac disease.

Grading COPD severity

The demonstration of airflow obstruction is central to the diagnosis of COPD. Spirometry is the only simple, accurate method of measuring airflow obstruction in these patients; peak expiratory flow measurements are less useful in COPD than in asthma. The Australian and New Zealand guidelines for the management of COPD (the COPDX plan) emphasise the importance of spirometry for making the diagnosis and grading severity in all patients in whom COPD is suspected.[3]

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Figure. Spirometry plays a vital part in the diagnosis of COPD.

The stages of COPD as defined in the COPDX plan are shown in the Table. Interestingly, although FEV_1 measurements correlate well with mortality in COPD, they correlate rather poorly with the degree of shortness of breath and disability. For example, a patient with an FEV_1 of 60% of predicted value may be more short of breath than another patient with more severe airflow obstruction. Other features that may contribute to the level of breathlessness and to patient wellbeing and quality of life include comorbidities such as cardiac disease, anxiety or depression, and lowered activity levels associated with deconditioning.

Scoring systems based on multiple measures are being developed to provide a more practical approach to classifying COPD and assessing its

continued

Table. Stages of COPD*

Stage	Postbronchodilator FEV_1
Mild	60-80% predicted
Moderate	40–59% predicted
Severe	<40% predicted

* According to: the COPDX plan[3]

effects on patients. Measurements being considered include the dyspnoea score, body mass index (BMI), arterial oxygen tension and some assessment of exercise capacity. The BODE index (B standing for BMI, O for degree of obstruction, D for dyspnoea score and E for exercise capacity as measured by six-minute walk distance) has been shown to be better than FEV_1 alone at predicting risk of death from all causes and from respiratory disease.[4]

The importance of early diagnosis

As shown in the box on this page:

- early identification of COPD can alter patients' outcomes[5]
- knowledge of a diagnosis of COPD can influence patients to stop smoking[6]
- patients with chronic bronchitis who stop smoking have improvements in their symptoms.[7,8]

For patients who have airflow obstruction, grading the severity of the impairment is important to:

- maximise the likelihood of smoking cessation if moderate or severe airflow obstruction is identified, since quitting can modify disease progression
- determine reversibility (defining an asthma component, which may warrant more aggressive treatment)
- monitor progress
- assess prognosis.

Management of stable COPD

The COPDX management guidelines are evidence-based guidelines adapted from the Global Initiative for Chronic Obstructive Lung Disease (GOLD) guidelines for

Diagnosing COPD and smoking cessation

Can early identification of COPD alter a patient's outcome?

Yes, early identification of COPD can alter a patient's outcome, as shown in the Figure.[5] The rate of decline of FEV_1 following smoking cessation is lessened compared with that of a smoker who continues to smoke after diagnosis. This Figure has been found to be a very useful tool when counselling patients about quitting smoking.

Does a diagnosis of COPD influence patients to stop smoking?

In a recent Polish study, smokers were offered smoking cessation advice after screening spirometry.[6] Subjects with moderate to severe COPD diagnosed by this screening test were more likely to have successfully quit smoking 12 months after the intervention than were those with normal lung function or only mild airflow obstruction.

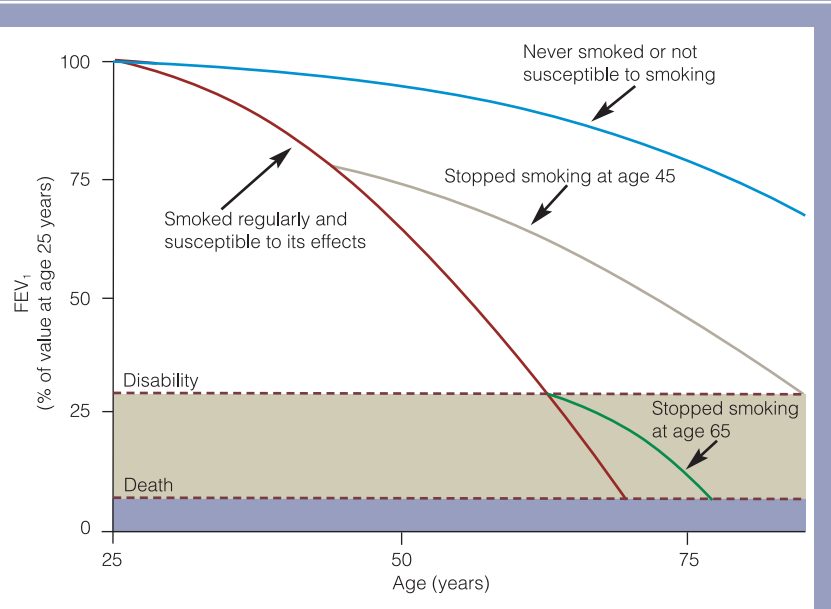

Figure. The effect of smoking on airflow obstruction. Adapted with permission from the BMJ Publishing Group (Fletcher C, Peto R. BMJ 1977; 1: 1645-1648).

If patients with chronic bronchitis stop smoking, do their symptoms improve?

Yes, smoking cessation decreases cough and phlegm, probably by reducing goblet cell numbers in central airways. It may also reduce wheeze and shortness of breath as well as normalising the excessive decline in FEV_1 that may be seen in these individuals. In established COPD with airflow obstruction, the underlying pathological changes are probably irreversible, which is why it is so important to identify smokers at risk early, using lung function tests.

COPD management.[3] The COPDX checklist is a useful summary of these guidelines. The key recommendations are listed in the COPD management checklist box on this page, and a detailed version for use in clinical practice is available via the Australian Lung Foundation website (see the resources box on this page).

Smoking cessation

Both supportive therapy and pharmacological aids, such as nicotine replacement therapy and bupropion (Zyban), increase the likelihood of success when attempting to stop smoking.[3]

Smoking is the most important risk factor for developing COPD, and smoking cessation is the only effective means of slowing the accelerated decline in FEV_1 caused by the disease.

Symptomatic therapy

Most other treatments are based around symptom improvement as none has been shown to alter mortality except oxygen therapy in patients with significant resting daytime hypoxaemia.

In symptomatic patients with moderate and severe COPD, short acting bronchodilators can give useful improvements in dyspnoea, quality of life and functional exercise capacity. For patients who continue to experience symptoms despite the use of short acting drugs, long acting inhaled anticholinergic agents such as tiotropium (Spiriva) and/or long acting β_2-agonists such as salmeterol (Serevent) or eformoterol (Foradile, Oxis Turbuhaler) should be used to control symptoms and improve exercise capacity and quality of life.

For patients with moderate to severe COPD (i.e. FEV_1 less than 50% predicted) who suffer more than two exacerbations a year, inhaled corticosteroids may reduce the frequency of exacerbations, although there is little evidence for any long term impact on the disease process. Some data suggest that combination therapy with long acting β-agonists plus inhaled corticosteroids provides greater symptomatic benefits than either component alone.

Older medications such as the bronchodilator theophylline (Nuelin) and drugs that reduce sputum viscosity may still have a role in certain patients. A meta-analysis of mucolytic therapy showed improvements in symptoms and some reduction in exacerbation rates compared with placebo. However, it is difficult to predict which patients will respond to either of these less commonly used treatments.

Pulmonary rehabilitation

For patients with shortness of breath and impaired exercise capacity despite pharmacological therapy, multidisciplinary pulmonary rehabilitation programs of seven to eight weeks' duration improve both exercise capacity and quality of life. There may also be added benefits from pulmonary rehabilitation in terms of reduced numbers of hospital presentations and lengths of admissions, although data are not robust in this area.

Ideally, all symptomatic patients with COPD should be referred for pulmonary rehabilitation. Many patients find the participation in pulmonary rehabilitation groups valuable also in terms of support networks. Many consumer-driven support groups are established throughout Australia and information about them is available through the Australian Lung Foundation.

Oxygen therapy

Oxygen therapy may be appropriate for patients who are hypoxaemic at rest (PaO_2 less than or equal to 55 mmHg, or 56 to 59 mmHg with evidence of end organ effects of the hypoxaemia). This is usually delivered via a concentrator and has been shown to prolong life in those with hypoxaemic COPD.

The role of oxygen for use during exertion or nocturnally for those who do not fulfil the abovementioned criteria is less clear. Evidence of desaturation with exertion, and of benefit with supplemental oxygen, is usually required before portable oxygen is provided by most funding bodies.

COPDX management checklist[3]

- **C** Confirm diagnosis by clinical assessment and spirometry
- **O** Optimise function with optimal drug therapy, smoking cessation and pulmonary rehabilitation
- **P** Prevent deterioration by maintenance of smoking cessation, regular review and vaccinations
- **D** Develop a self-management plan for use in stable COPD
- **X** Manage exacerbations

Useful resources

The Australian Lung Foundation
Phone: 1800 654 301
Website: www.lungnet.com.au

National Tobacco Campaign
Quitline: Phone 131 848
Quitnow website: www.quitnow.info.au

Treating exacerbations

Many patients with COPD do not have frequent exacerbations, but others are beset by frequent flare-ups of their disease. Patients who have frequent exacerbations have a worse prognosis, so they should benefit from anything that can be done to prevent these exacerbations.

The frequency of exacerbations may be reduced by the following:

- appropriate use of inhaled corticosteroids and bronchodilators
- vaccinations against both influenza and pneumococcal infection.

The impact of exacerbations should be minimised by the following:

- starting appropriate treatment with oral corticosteroids and/or antibiotics

- providing adequate support
- ensuring patients know how to recognise and respond promptly to a change in symptoms.

Patient recognition of the symptoms of an exacerbation and prompt treatment of these lessens recovery time, reduces the risk of hospitalisation and is associated with better health-related quality of life.

If patients require hospitalisation and are hypercapnic, noninvasive ventilation is now the gold standard for management. This treatment leads to reduced lengths of hospitalisation, less requirement for intensive care and invasive ventilation, and reduced mortality.

Pulmonary outreach nursing for patients who require frequent hospitalisations for exacerbations of COPD (the so-called 'frequent flyers') may reduce the number of admissions for these patients.

Conclusion

Chronic bronchitis is part of the spectrum of COPD. It is important to think about COPD when patients present with chronic respiratory symptoms, particularly if these patients are current or ex-smokers or have other risk factors.

Spirometry has a vital part in the diagnosis of COPD, and the results are likely to impact significantly on a smoker's likelihood of quitting smoking. Apart from smoking cessation there are many treatment options for managing patients with COPD to ensure that their quality of life is maximised despite their chronic disease.

Further information about investigation and management is contained in the COPDX plan and checklist, available from the Australian Lung Foundation website. MT

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Further reading

1. National Collaborating Centre for Chronic Conditions. Chronic obstructive pulmonary disease. (NICE Guideline No. 12.) Thorax 2004; 59(Suppl 1): 1-232.

DECLARATION OF INTEREST: The author has no commercial associations that might create a conflict of interest. Over the past three years she has spoken at several drug company-sponsored meetings in Australia (GlaxoSmithKline, Astra Zeneca, Boehringer Ingelheim/Pfizer). She has also been invited to several stand-alone meetings overseas sponsored by the aforementioned companies.