COPD
Preventing hospitalisations this winter

Effective and appropriate management of patients with chronic obstructive pulmonary disorder (COPD), including vaccination against influenza, avoiding exposure to cigarette smoking, participating in regular exercise, having a healthy diet and treating exacerbations early, should help prevent hospitalisations due to COPD exacerbations.

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Chronic obstructive pulmonary disease (COPD) is a common clinical problem encountered in general practice, with about one million Australians being significantly affected by long–term lung conditions characterised by shortness of breath, such as chronic bronchitis and emphysema.[1] Exacerbations of COPD significantly impair a patient's quality of life, contribute to progressive decline in lung function and are frequently under-recognised by both the patient and medical staff. There are considerable rises in the numbers of COPD exacerbations and hospital admissions during the winter months, and COPD accounts for more than 50,000 admissions each year.[2]

This article outlines current recommendations for the care of patients with COPD and the management of exacerbations in the general practice setting, with the aim of helping to reduce the numbers of exacerbations and hospitalisations this winter. Advanced treatment measures for exacerbations of COPD are beyond the scope of this review and are not discussed in detail here.

Optimising baseline COPD management

Ensuring that each patient's usual COPD management is effective and appropriate will help in reducing the impact of exacerbations.[3] All patients with COPD may develop an exacerbation, and

IN SUMMARY

- **Early treatment of patients with exacerbations of chronic obstructive pulmonary disease (COPD) may reduce hospitalisations.**
- **Review underlying COPD management, ensuring each patient has a comprehensive treatment plan, pharmacological and nonpharmacological.**
- **Encourage all patients to have a COPD self-management plan.**
- **Keep vaccinations up to date; use patient recall system if needed.**
- **Review patients early and regularly after an exacerbation, whether treated at home or hospital; readmission risk is highest within three months of discharge.**
- **Consider involving outreach and community home services in the management of patients with COPD.**
- **Pulmonary rehabilitation is an effective intervention in COPD and can improve quality of life, fitness and self-confidence, and reduce hospitalisations.**

even those with underlying mild disease may experience a severe exacerbation, particularly in the winter months. However, those with severe COPD are more likely to have a serious, possibly life-threatening, outcome if they suffer even a mild exacerbation.

The Australian and New Zealand COPD guidelines are based on the Global Initiative for Chronic Obstructive Disease (GOLD) Report and are regularly updated. The current version is available online through the Australian Lung Foundation website, http://www.lungfoundation.com.au.[4,5] These guidelines are known as the COPD-X plan, from:

C – confirm diagnosis
O – optimise function
P – prevent deterioration
D – develop a self-management plan and manage
X – exacerbations.

An approach to the management of patients with COPD based on these guidelines is discussed in this article.

Diagnosis and classification

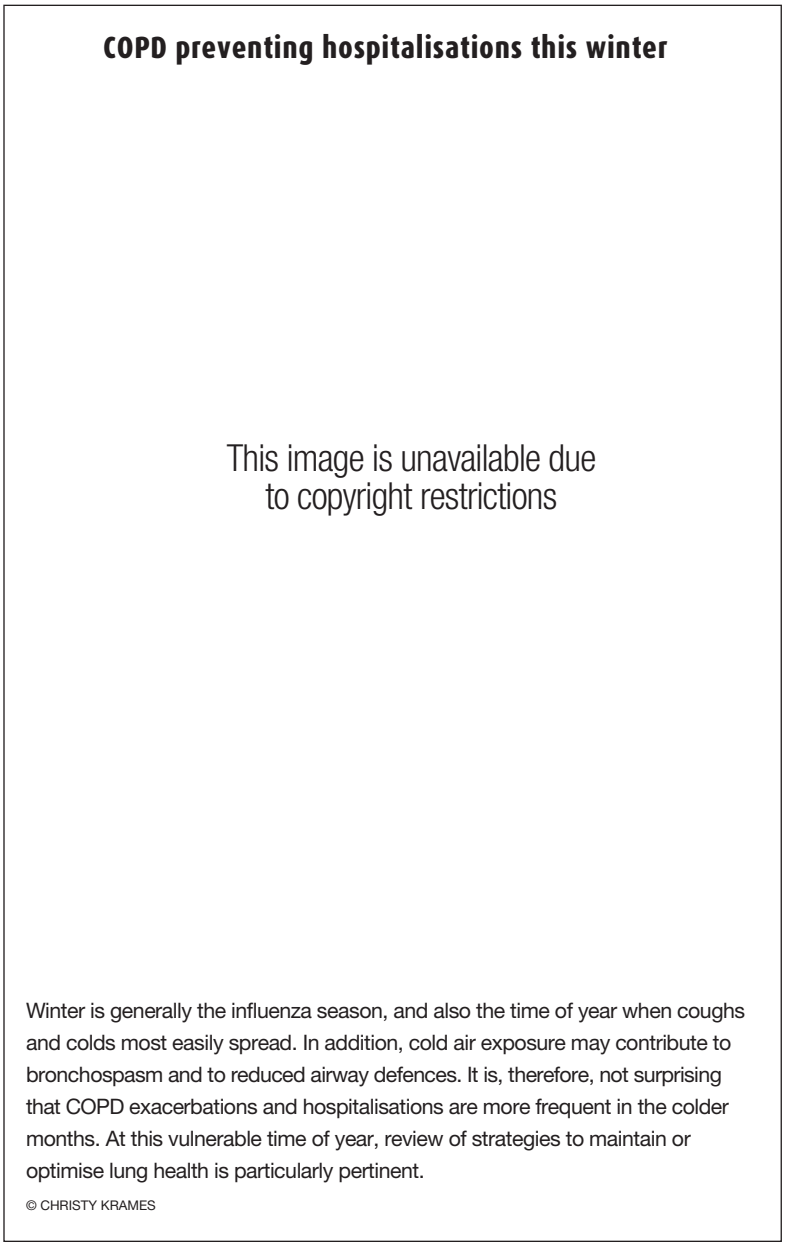
COPD should be considered in any patient who has dyspnoea, chronic cough or sputum production, and a history of exposure to risk factors for the disease, mainly smoking (usually more than 15 pack-years). The diagnosis should be confirmed by spirometry. COPD is defined as a post-bronchodilator forced expiratory volume in one second (FEV_1) to forced vital capacity (FVC) ratio below 0.7.[4] If the airflow obstruction is substantially or fully reversible (that is, the ratio is above 0.7), the patient should be treated as for asthma.[4]

Classification of COPD severity is based on the combination of FEV_1 measurement, functional assessment and the presence of complications.[4] There is a general correlation between severity of airflow obstruction (as assessed by FEV_1) and COPD mortality. Other important determinants of COPD outcome include the patient's nutritional status as measured by body mass index (BMI) and level of exercise limitation, and the severity of dyspnoea.[6]

There is a continuum of COPD from mild to severe disease. The severity of the airflow obstruction has been classified by a number of scales. One classification, from the COPD-X guidelines, is:[4]

- mild airflow obstruction – an FEV_1/FVC ratio of below 0.7 post-bronchodilator and FEV_1 60 to 80% of predicted normal
- moderate airflow obstruction – FEV_1 40 to 59% predicted
- severe airflow obstruction – FEV_1 less than 40% predicted.

COPD preventing hospitalisations this winter



Winter is generally the influenza season, and also the time of year when coughs and colds most easily spread. In addition, cold air exposure may contribute to bronchospasm and to reduced airway defences. It is, therefore, not surprising that COPD exacerbations and hospitalisations are more frequent in the colder months. At this vulnerable time of year, review of strategies to maintain or optimise lung health is particularly pertinent.

Treatment

Management strategies in patients with COPD focus on the relief of symptoms, the prevention of disease

Inhaled therapy delivery methods[4]

Metered dose inhalers

Metered dose inhalers (MDIs) may be pressurised or breath-activated and use a chemical propellant to push the medication out of the canister. Many patients do not use pressurised MDIs properly because it can be difficult to co-ordinate the release of medication with inhalation. It is important that patients are taken step by step through correct inhaler technique and that their technique is checked by direct observation. Common areas of error include the inability to co-ordinate activation with inhalation of the drug, failure to hold the breath for a sufficient time, performing multiple actuations without waiting or shaking the inhaler between actuations, and incorrect positioning of the inhaler. Inhaler technique frequently declines over time, so regular review is essential.

The use of spacers is recommended for most patients taking medications by pressurised MDIs because of the limitations of these inhalers. Spacers slow the delivery of medication from pressurised MDIs and make it easier for the medication to reach the distal airways. This reduces deposition of medication in the mouth and throat and thus decreases local corticosteroid-related complications. Spacers may make inhalers less portable but as many inhalers are used twice a day they can be left at home for morning and evening use. The authors favour the tidal breathing method, where the patient puffs one dose of medication in the spacer, breathes normally for four breaths, and repeats the procedure as needed.

MDIs can be difficult for patients with osteoarthritis of the hands and may be unsuitable for patients with severe COPD who are not able to achieve the required inspiratory flow rates.

Use of a breath-activated MDI overcomes the co-ordination problems of the pressurised MDIs and can improve lung deposition in patients with poor MDI inhaler technique. In these devices, a flap valve is triggered and the dose of medication automatically releases as the patient starts a slow, deep breath through the mouthpiece.

Dry powder inhalers

Dry powder inhalers are breath-activated and either single-dose or multidose. They do not contain propellants, only the medication as a dry powder. Although they do not depend on good co-ordination, they still require good technique to ensure optimal drug delivery. They generally deliver a consistent medication dose across a wide range of inspiratory flow rates.

Nebulisers

A pressurised MDI with a spacer is as effective as a nebuliser if an equivalent dose is used (about 10 puffs of salbutamol MDI 100 µg is equivalent to salbutamol 5 mg nebule). However, nebulisers require no co-ordination to use and are preferred by some patients, who find them more effective than other devices, particularly during of exacerbations or if symptoms are severe.

Which to use?

The choice of device for each patient is based on the patient's ability to use the device and his or her preference, experience and inspiratory flow rate. The device should be selected carefully. No one device is suitable for all patients, and doctors need to be familiar with all the available devices and able to instruct patients in their use. Further details are available on the COPD-X web site (see COPD-X Guidelines, Appendix 2; http://www.copdx.org.au/guidelines/a_append_2.asp).

progression and the prevention and treatment of exacerbations and complications, with the aims of improving exercise tolerance and health status, and reducing mortality. The extents to which these goals can be realised vary with each patient, and some treatments will produce benefits in more than one area.

COPD is usually a progressive disease, despite best current management. Reduction of therapy once symptom control has been achieved is not normally possible in COPD. Further decline in lung function usually requires the progressive introduction of more treatments, both pharmacological and nonpharmacological.

In addition, patients with COPD are usually elderly and often have comorbidities such as cardiac failure, diabetes and gastro-oesophageal reflux disease. These issues may be worsened by COPD medications, and the comorbidities themselves may aggravate COPD or dyspnoea. The patient's overall health status needs to be taken into account with all COPD managements. Osteoporosis risk should be specifically assessed; osteoporosis is common in this patient group, and may be worsened by inhaled or oral corticosteroids.

Short-acting bronchodilators

Short-acting bronchodilators such as the beta$_2$ agonists salbutamol and terbutaline or the anticholinergic drug ipratropium bromide are central to the symptomatic management of COPD. They are given on an as-needed or regular basis to prevent or reduce symptoms. Introduction of these medications is also an appropriate time to educate patients in inhaler technique. If metered dose inhalers are used then the addition of a spacer should be encouraged because they help deliver the drug more efficiently to the distal airways (see the box on inhaled therapy delivery on this page).

Long-acting bronchodilators

If symptoms persist, the long-acting anticholinergic drug tiotropium (18 µg inhaled daily) can be used instead of the short-acting anticholinergic medication.[7]

The cardiovascular safety of inhaled anticholinergic medications in patients with COPD has recently been under discussion.[8] The current safety information is conflicting and incomplete, and full review of this issue is beyond the scope of this article. However, tiotropium is likely to remain safe and helpful. With regard to short-acting bronchodilators, the cardiovascular risk profile of the individual patient should be considered when either anticholinergics or $beta_2$ agonists are used.

Long-acting $beta_2$ agonists (salmeterol, eformoterol) may improve lung function and symptoms, but as single-ingredient inhalers are not PBS listed for use in COPD. These drugs have a role in combination with inhaled corticosteroids in patients with at least moderate COPD.

Combination long-acting $beta_2$ agonist and inhaled corticosteroid therapy

Combination therapy with a long-acting $beta_2$ agonist such as salmeterol or eformoterol and an inhaled corticosteroid such as fluticasone or budesonide may be appropriate for COPD patients with FEV_1 less than 50% predicted and frequent exacerbations (more than two per year).[9] In this patient group, this combination has been shown to improve quality of life and decrease exacerbations.

Despite the effectiveness of inhaled corticosteroids in reducing the numbers of exacerbations, there have been concerns that they may increase the risk of pneumonia. This needs further evaluation. In the meantime, awareness of this possible risk and prompt treatment of infections is advised. In an individual patient, such treatment needs to be balanced against all potential side effects. Treatment should be reviewed after four to eight weeks, and discontinuation considered if side effects appear likely to outweigh benefits. Single-ingredient corticosteroid inhalers are not PBS listed for COPD.

The PBS listing of the fluticasone with salmeterol preparation Seretide (only the 250/25 metered-dose inhaler and 500/50 dry powder inhaler formulations) includes the symptomatic treatment of COPD in people with FEV_1 below 50% of predicted normal and a history of repeated exacerbations with significant symptoms despite regular $beta_2$ agonist treatment. These Seretide formulations not PBS listed for initiating bronchodilator therapy in patients with COPD. The budesonide with eformoterol preparation Symbicort is not currently TGA approved for COPD.

Combination long-acting $beta_2$ agonist, inhaled corticosteroid and long-acting anticholinergic therapy

In practice, most patients with severe COPD are on 'triple' therapy with a long-acting $beta_2$ agonist, an inhaled corticosteroid and a long-acting anticholinergic drug, as well as a short-acting $beta_2$ agonist as needed. A recent study suggests that triple therapy in patients with moderate to severe COPD leads to improved quality of life and hospitalisations, although not a reduction in exacerbations.[10]

Other medications

Chronic treatment with systemic corticosteroids should be avoided because of an unfavourable benefit to risk ratio.

The use of long-term oral antibiotics has not been shown to be of benefit in reducing exacerbations.

Theophylline has a modest broncho - dilator effect, but its use has largely gone out of favour in Australia due to its narrow therapeutic index and potential for significant side effects. Recent studies have suggested lower dose preparations of theophylline may have immunomodulatory effects, but inhaled bronchodilators are generally preferred.

Phosphodiesterase type-4 inhibitors are potential candidates for the treatment of COPD. Further research should determine their long-term impact and role.

Referral of patients

Referral of patients to a respiratory phy - sician should be considered if COPD is severe, the diagnosis is unclear or complications such as cor pulmonale are present (Table 1).

Table 1. COPD: when to consider referral to a respiratory physician

- Suspected severe COPD, for confirmation of diagnosis and optimisation of management
- Uncertain diagnosis of COPD
- Young patients (less than 40 years) or suspected alpha-1 antitrypsin deficiency
- Onset of cor pulmonale
- Rapid decline in FEV_1, for early intervention
- For assessment for long-term oxygen therapy (benefit has been shown in hypoxaemic COPD with stable daytime PaO_2 of 55 mmHg or lower)
- Symptoms disproportionate to lung function deficits
- Frequent exacerbations
- For assessment for possible surgical intervention (lung volume techniques, lung transplantation)
- Other multiple comorbidities such that multidisciplinary care required (including assessment of social supports and assistance in `Advance Care Directives` planning)

Reducing the risk of COPD and exacerbations

Winter is generally the influenza season, and also the time of year when coughs and colds are most easily spread because people are more often in indoor environments. Cold air exposure may contribute to bronchospasm and to reduced airway defences. Thus it is not surprising that COPD exacerbations, and hospitalisations, are more frequent in the colder months. Review of strategies to maintain or optimise lung health can be particularly pertinent at this vulnerable time of year.

Table 2. Brief strategies to help patients willing to quit smoking – the five As[5]

Ask	Systematically identify all tobacco users at every visit
Advise	Strongly urge all tobacco users to quit
Assess	Determine willingness to make a quit attempt
Assist	Aid the patient in quitting
Arrange	Schedule follow-up contact

Smoking cessation

Smoking cessation remains the single most effective intervention in most people to stop or slow progression of COPD. Aim to identify all ongoing, or relapsed, smokers at every consultation. Each brief counselling intervention increases the chances of successful cessation by 5 to 10%.[11] No one cessation plan works for all; each patient needs discussion as to his or her best technique. As few smokers are successful in their first attempt at quitting, perseverance by everyone is important.

Only 3 to 5% of smokers manage to quit smoking by willpower alone,[12] so additional measures are often needed. The five As can be used as a framework for helping patients who are willing to quit smoking (Table 2):[5]

- Ask – systematically identify all tobacco users at every visit: implement a system that ensures that tobacco use status is queried and documented for every patient at every visit
- Advise – explain to smokers the risks of smoking and the benefits of quitting
- Assess – determine each smoker's degree of nicotine dependence and willingness to quit
- Assist – aid the patient in quitting: help the patient with a quit plan, provide practical counselling, recommend the use of approved pharmacotherapy (unless contraindication to these medications is present), provide supplementary materials and refer to a formal program
- Arrange – schedule follow-up contact, either in person or via telephone.

Nicotine dependence is most effectively treated with a combination of nicotine replacement therapy (NRT), behavioural support and medications. Tools such as the Fagerström Test can be used to assess the degree of nicotine dependence and can help to guide therapies.[13] NRT (available as a patch, gum, lozenge, sublingual tablet and inhaler) is widely available and is particularly helpful in those smokers with a high degree of nicotine dependence.

Patients may need a combination of NRTs, such as patches to provide a baseline nicotine level and a more rapidly absorbed product such as a gum or inhaler to give a higher acute nicotine level when needed. This is preferable to smoking while using a patch. Smoking cessation clinics are accessible in many areas, and resources such as QUITLINE can offer 24-hour counselling (see the box on this page).

Two medications are now available to assist smoking cessation, varenicline and bupropion. NRT can be used in combination with these medications, and self-administered NRT should be available after their cessation. Varenicline is a partial agonist of nicotinic receptors, binding selectively and with high affinity to produce the effect of alleviating the symptoms of craving and withdrawal. It simultaneously has the antagonistic activity of reducing the rewarding and reinforcing effects of smoking by preventing nicotine binding to receptors.

Clinical trials show that use of varenicline results in sustained quit rates even after one year of up to 30%, compared with 20% for bupropion and only 10% for placebo. Common side effects are nausea, headache and bizzare dreams. Use of varenicline should be avoided in patients with co-existing psychiatric illness, renal disease or epilepsy and in those being treated with an antidepressant.

Varenicline is usually given at a dose of 1 mg twice daily over 12 weeks after an initial first week of titration. The patient should set a withdrawal date for smoking cessation while on medication, usually after the first one to two weeks of treatment. Under the PBS, varenicline may be prescribed on authority for a period of 12 weeks over 12 months if the patient is ready to quit smoking and has entered a comprehensive support and counselling program. The course of treatment can be repeated again after one year.

Bupropion is an antidepressant that is a selective inhibitor of neuronal uptake of catecholamines (noradrenaline and dopamine). However, it also acts as a non-competitive nicotine receptor antagonist. Dosing is commenced at 150 mg daily for three days and then increased to 150 mg twice daily for at least seven weeks. Common side effects include headache, insomnia, dry mouth and agitation. It is contraindicated in seizure disorders, CNS tumours and in patients on monoamine oxidase inhibitors. Sustained-release bupropion has a one in 1000 risk of causing seizures.

Vaccination

Many COPD exacerbations are due to viral or bacterial infections of the lower respiratory tract. Annual influenza vaccination has proven to be of value in reducing COPD exacerbations, and all patients with COPD should be offered influenza vaccination, preferably in the autumn. Development of an immune response takes at least two weeks, and a protective level of immunity occurs in up to 70% of patients, although lower response rates may occur with increasing patient age. Repeat vaccination later in the influenza season may also be considered in the elderly and in those with underlying severe airways disease. As the influenza virus changes its structure (by antigenic drift), leading to yearly epidemics, vaccination annually with the strain prevalent at the time is recommended to provide adequate immunity.

Persons who have an allergy to eggs should not be given influenza vaccine. This includes people who, on eating eggs, develop swelling of the lips or tongue or experience acute respiratory distress or collapse. Influenza vaccine should also not be given to patients with a current febrile illness.

To date, there is no evidence that vaccination with the 23-valent pneumococcal vaccine reduces COPD exacerbations. However, consensus opinion favours its use, and so it is recommended that it be offered to all patients with COPD, with repeat vaccination after five years. The only absolute contraindications to pneumococcal vaccine are anaphylaxis after a previous dose of the vaccine or sensitivity to any vaccine components. Relative contraindications affecting specifically the over-65 years age group include the recent use of immunosuppressants or radiation of lymph nodes. However, once it is considered that patients in these groups are immunologically stable then they should be promptly re-vaccinated.

Exercise, pulmonary rehabilitation and nutrition

Many patients with COPD are physically inactive. Regular physical activity is recommended for all patients with COPD

Patient resources for quitting smoking

Quitline: Tel: 131 848 and 13 QUIT (13 7848), nationwide, http://www.quitnow.info.au
QUIT Victoria: Tel: (03) 9663 7777, http://www.quit.org.au
QUIT South Australia: Tel: (08) 8291 4141, http://www.quitsa.org.au
QUIT Tasmania: Tel: (03) 6228 2921, http://www.quittas.org.au

www.quitnow.info.au – The National Tobacco Campaign, Federal Government
www.ashaust.org.au – ASH Australia (Action on Smoking and Health Australia)
www.tobaccoinaustralia.org.au – *Tobacco in Australia: Facts and Issues.* 3rd ed. Melbourne: Cancer Council Victoria; 2008. A comprehensive review of the major issues in smoking and health in Australia; available online, free of charge.

The Australian Lung Foundation (ALF) and LungNet: Tel:1800 654 301, http://www.lungfoundation.com.au
The LungNet is a network of affiliated Patient Support Groups Australia-wide and provides information and referral assistance.

and reduces the risk of admissions and mortality related to COPD.[14] Doctors can discuss 'exercise prescriptions' with their patients and encourage daily exertion. Formal pulmonary rehabilitation should be offered to patients with moderate–severe COPD, but also can be of help to all those who have chronic lung disease (of any severity) and are limited by dyspnoea. Pulmonary rehabilitation programs are available at many community centres and hospitals, and usually welcome referrals from general practitioners.

The benefits of pulmonary rehabilitation in improving dyspnoea, quality of life, exercise capacity, anxiety and depression, fatigue and emotional function are well established. Evidence also suggests that pulmonary rehabilitation is a highly effective and safe intervention to reduce hospital admissions and mortality and to improve health-related quality of life in COPD patients after exacerbations.[15] Pulmonary rehabilitation programs consist of general assessment of the patient (including history) and specific assessment of his or her exercise capacity and quality of life, followed by an exercise program and education sessions.

Exercise training is the essential component of pulmonary rehabilitation. Each patient is given a supervised and graded exercise program, adjusted to his or her abilities. Continuation of regular physical activity at home is essential for maintaining the training benefits. Exacerbations are the most common reason for exercise non-adherence reported by patients with COPD.

Education sessions generally include proper use of medications, nutrition advice and anxiety reduction. Very disabled patients are shown how to reduce unnecessary energy expenditure during activities of daily living. Anxiety itself is associated with increased COPD hospital admissions.[16] Aim to identify and manage the common problems of anxiety and depression in COPD patients; however, be very mindful of the risk of sedatives in those prone to hypercapnia.

Maintenance of a normal BMI and good nutritional status improve the overall outcome in patients with COPD. Both high and low BMIs are associated with increased morbidity in patients with COPD. A high BMI increases the work of breathing and predisposes the patient to complications such as sleep apnoea and hypoventilation. Progressive weight loss or BMI below 20 kg/m^2 are important prognostic factors for poor survival. This may be the result of the high energy demands of increased work of breathing added to poor nutritional intake. (A person with COPD requires considerably

more energy just to breathe than a person with normal lungs, making nutrition all the more important.) Patients with severe COPD are often dyspnoeic while eating.

Prompt nutritional intervention is recommended for patients with BMIs below 20 kg/m^2 and those with a weight loss of more than 6 kg over the past six months. Patients with COPD and severe dyspnoea should not eat large meals, as this can increase the dyspnoea; several small nutritious (high energy and high protein) meals are better tolerated. Snacks may provide a useful addition to energy and nutrient intake. Referral to a dietitian for individual advice may be beneficial.[4]

Management of exacerbations

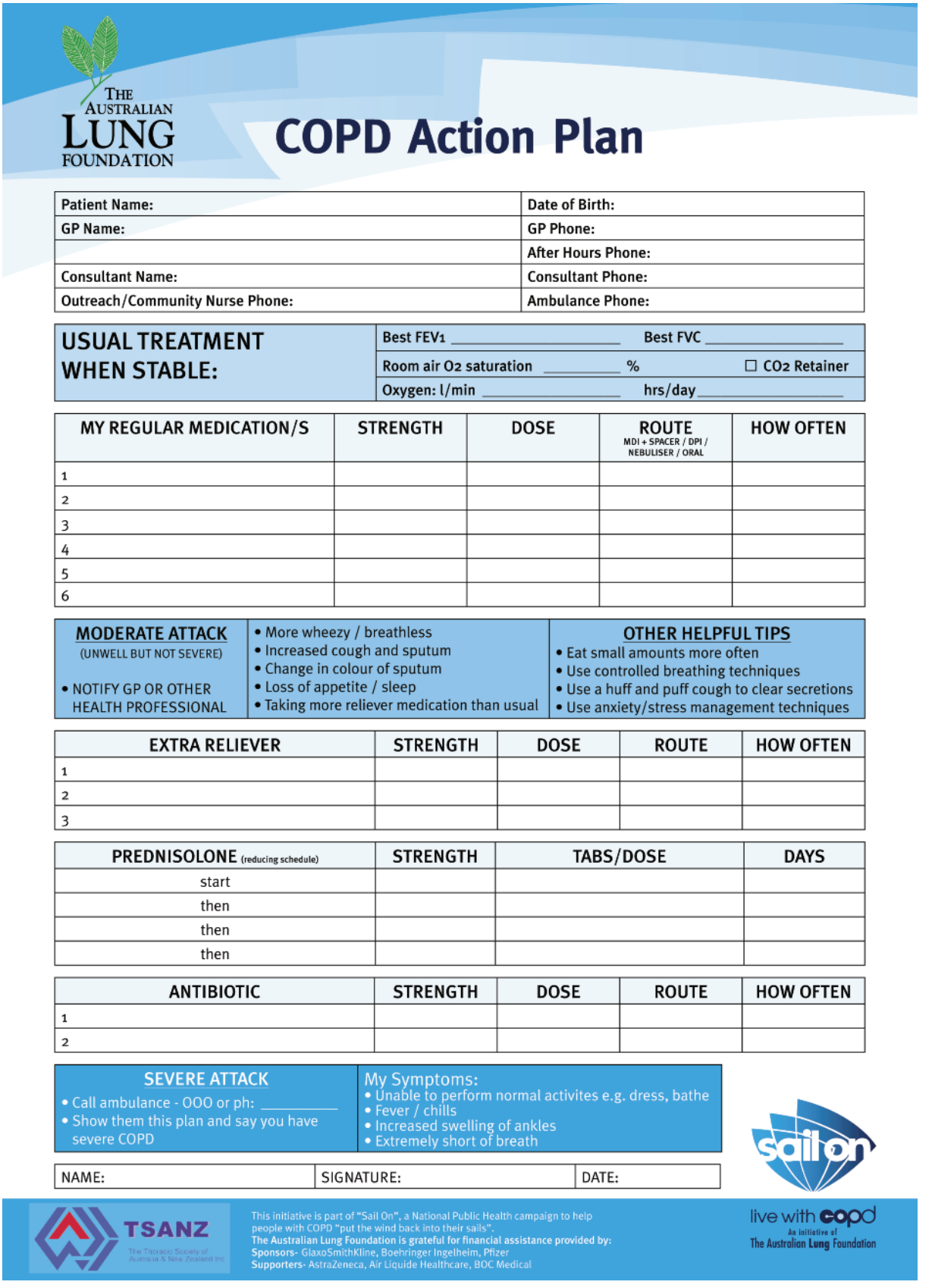
A COPD exacerbation is 'an event in the natural course of the disease characterised by a change in the patient's baseline dyspnoea, cough, and/or sputum that is beyond normal day-to-day variations, is acute in onset, and may warrant a change in regular medication in a patient with underlying COPD'.[4,5] Infections, either viral or bacterial, are the most common cause, but about one-third of exacerbations are of uncertain cause. Other issues such as left ventricular failure, pulmonary embolus or inappropriate sedative use may contribute.

Patients with COPD exacerbations often require hospital admission for treatment of respiratory failure. However, early recognition and treatment may prevent admission.[17] All patients with COPD need to take an active part in their own health promotion to manage exacerbations. COPD self-management or action plans are an important tool to help people to recognise the onset of an exacerbation and act appropriately (see Figure).[18] Although the impact of these plans on mortality and morbidity is not yet proven, every patient with COPD should be encouraged to have an action plan. This plan should indicate which step-up medications to take, including antibiotics and oral corticosteroids, and should also require patients to contact their general practitioners and/or community nurses to allow rapid assessment.

Outreach teams

Many regions now have specialist multidisciplinary outreach teams to assist in the co-ordination of home care. For example, in Victoria, the Hospital Admission Risk Program (HARP) aims to reduce avoidable hospital admissions and emergency department presentations (http://www.health.vic.gov.au/harp-cdm).

Services provided by these teams may include outreach services with rapid response such as a mobile assessment and



THE AUSTRALIAN LUNG FOUNDATION

COPD Action Plan

Patient Name:	Date of Birth:
GP Name:	GP Phone:
	After Hours Phone:
Consultant Name:	Consultant Phone:
Outreach/Community Nurse Phone:	Ambulance Phone:

USUAL TREATMENT WHEN STABLE:

Best FEV1 _____ Best FVC _____

Room air O2 saturation _____ % ☐ CO2 Retainer

Oxygen: l/min _____ hrs/day _____

MY REGULAR MEDICATION/S	STRENGTH	DOSE	ROUTE MDI + SPACER / DPI / NEBULISER / ORAL	HOW OFTEN
1				
2				
3				
4				
5				
6				

MODERATE ATTACK
(UNWELL BUT NOT SEVERE)

- NOTIFY GP OR OTHER HEALTH PROFESSIONAL

- More wheezy / breathless
- Increased cough and sputum
- Change in colour of sputum
- Loss of appetite / sleep
- Taking more reliever medication than usual

OTHER HELPFUL TIPS

- Eat small amounts more often
- Use controlled breathing techniques
- Use a huff and puff cough to clear secretions
- Use anxiety/stress management techniques

EXTRA RELIEVER	STRENGTH	DOSE	ROUTE	HOW OFTEN
1				
2				
3				

PREDNISOLONE (reducing schedule)	STRENGTH	TABS/DOSE	DAYS
start			
then			
then			
then			

ANTIBIOTIC	STRENGTH	DOSE	ROUTE	HOW OFTEN
1				
2				

SEVERE ATTACK

- Call ambulance - OOO or ph: _____
- Show them this plan and say you have severe COPD

My Symptoms:

- Unable to perform normal activites e.g. dress, bathe
- Fever / chills
- Increased swelling of ankles
- Extremely short of breath

NAME:	SIGNATURE:	DATE:

sail on

TSANZ The Thoracic Society of Australia & New Zealand Inc

This initiative is part of "Sail On", a National Public Health campaign to help people with COPD "put the wind back into their sails".
The Australian Lung Foundation is grateful for financial assistance provided by:
Sponsors- GlaxoSmithKline, Boehringer Ingelheim, Pfizer
Supporters- AstraZeneca, Air Liquide Healthcare, BOC Medical

live with copd
An initiative of The Australian Lung Foundation

Figure. The Australian Lung Foundation's COPD Action Plan. This plan and an information sheet for patients with COPD on how to keep well are available online at: http://www.copdx.org.au/guidelines/documents/COPDX_v2_18.pdf. (Reproduced from Abramson M, Crockett AJ, Frith P, et al. The COPD-X plan: Australian and New Zealand guidelines for the management of chronic obstructive pulmonary disease 2009. Lutwyche, Qld: Australian Lung Foundation; 2009, with permission. Australian Lung Foundation toll free number: 1800 654 301.)

treatment service (assessment by medical practitioner and outreach nurse) and home visit assessment service. Other home services, such as physiotherapy and pharmacy, may also be accessible. The evidence is not yet available regarding the overall patient and economic benefits of home care, but a systematic review of seven studies found no significant differences in readmission rates or mortality, and 'Hospital at Home' schemes were preferred by patients and carers.[19] Some patients may need initial hospital assessment, and may then be able to be returned to their own homes with increased social support and a supervised medical care package.

Assessing exacerbation severity

Initial assessment of the severity of an exacerbation is based on the patient's prior medical history, comorbidities, symptoms and physical examination. Ask specifically about the frequency and severity of dyspnoea and cough, sputum volume and colour, and limitation of daily activities. If relevant and possible, perform pulse oximetry and consider full blood examination, inflammatory markers, electrolytes, chest x-ray, electrocardiography, arterial blood gas measurement and spirometry. If available, results of previous spirometry and arterial blood gas measurements are extremely helpful.

For patients with underlying severe COPD, the most important signs of a severe exacerbation are worsening hypoxaemia, acute respiratory acidosis or both. These signs are often signalled by altered mental state, and they indicate a need for immediate hospital evaluation.[4,5]

Criteria to consider for hospital admission or assessment are listed in Table 3.[4] In addition to these, there is recent evidence that raised plasma inflammatory markers are associated with an increased incidence of COPD requiring hospitalisation.[20]

Treating exacerbations

Bronchodilators, corticosteroids and antibiotics

The mainstays of the medication treatment of COPD exacerbations are bronchodilators, corticosteroids and antibiotics. Short-acting bronchodilators are given to relieve symptoms. Delivery is by pressurised metered dose inhaler and spacer or by dry powder inhaler (salbutamol 100 μg, four to 10 puffs; terbutaline 500 μg, two puffs or more; ipratropium 20 μg, four puffs), or by jet nebulisation (salbutamol 2.5 to 5 mg; terbutaline 5 mg; ipratropium 500 μg). The dose interval is titrated to the response.

Oral corticosteroids speed resolution of the exacerbation and reduce the chance of relapse. Prednisolone 40 to 50 mg daily

for up to two weeks is adequate; longer courses add no further benefit and have a higher risk of side effects.[4]

Antibiotics to cover typical and atypical organisms should be given if the sputum is purulent or there are other features suggesting infection (such as leucocytosis or raised inflammatory markers). If possible, sputum should be sent for culture (this is useful information in the event of treatment failure), but initial antibiotic therapy is usually empiric.

Haemophilus influenzae, Streptococcus pneumoniae and *Moraxella catarrhalis* are commonly involved organisms. *Mycoplasma pneumoniae* and *Chlamydia pneumoniae* are seen relatively frequently. Initial treatment with a broad-spectrum antibiotic such as oral amoxycillin 500 mg three times daily or oral doxycycline 100 mg twice daily for five days is common practice, although treatment should be adjusted if current or previous sputum culture results suggest alternate therapy. If atypical organisms are suspected, a macrolide should be added, such as roxithromycin 300 mg daily. If amoxycillin-resistant *Haemophilus* is suspected then amoxycillin–clavulanate should be used instead of amoxycillin.

As lung function declines, and in

Table 3. COPD: indications for hospitalisation[4]*

- Patient has marked increase in intensity of symptoms
- Patient has acute exacerbation characterised by increased dyspnoea, cough or sputum production, plus one or more of the following:
  - inadequate response to ambulatory management
  - inability to walk between rooms when previously mobile
  - inability to eat or sleep because of dyspnoea
  - cannot manage at home even with home-care resources
  - high risk comorbidity condition — pulmonary (e.g. pneumonia) or non-pulmonary
  - altered mental status suggestive of hypercapnia
  - worsening hypoxaemia or cor pulmonale

* Reproduced from Abramson M, Crockett AJ, Frith P, et al. The COPD-X plan: Australian and New Zealand guidelines for the management of chronic obstructive pulmonary disease 2009. Lutwyche, Qld: Australian Lung Foundation, 2009, with permission. Available online at: http://www.copdx.org.au/guidelines/documents/COPDX_v2_18.pdf. Australian Lung Foundation toll free number: 1800 654 301.

Table 4. COPD review checklist[4]*

- Assess the patient's coping ability and strategies
- Measure FEV_1 and performance status
- Reassess inhaled and oral medications
- Review management of comorbidities such as left ventricular failure and sleep apnoea
- Reassess medication adherence and inhaler techniques
- Review vaccination status (influenza and pneumococcal)
- Assess need for long-term oxygen therapy (will require referral to respiratory physician)
- Consider referral for pulmonary rehabilitation
- Assess risk of osteoporosis, and management
- Counsel and/or refer for smoking cessation
- Assess nutritional status
- Assess for anxiety, panic disorder and depression
- Consider advanced care directives and end–of life issues

patients with recent hospital or institutional exposures, organisms such as *Pseudomonas aeruginosa* and *Staphylococcus aureus* may become involved. Patients should be reviewed regularly, and given advice on warning signs of deterioration.

Oxygen therapy and noninvasive ventilation

Patients with severe COPD may require controlled oxygen therapy and ventilatory assistance; hospital admission will almost certainly be needed. Patients who are already on continuous long-term home oxygen therapy should continue this treatment. However, there should be a low threshold for hospital evaluation in this group as patients on such treatment can be considered as having already declared themselves to have very severe COPD.

Noninvasive ventilation is now widely and very effectively used in patients with exacerbations of COPD complicated by hypercapnic respiratory failure, and has led to improved survival and reduced hospital length of stay. Clearly, it is a hospital-based treatment. Symptoms and signs suggestive of respiratory failure include severe dyspnoea not responding to initial treatment, and confusion, lethargy or altered mental state.

Follow up after an exacerbation

All patients discharged from hospital after an exacerbation of their COPD should have an early (preferably within one week) follow-up consultation with their general practitioner. Patients who have had a recent exacerbation are at great risk of a further exacerbation in the subsequent weeks. All the preventive strategies for COPD exacerbations discussed above should be revisited during this consultation, including revising the patient's COPD self-management or action plan.

This may also be a good time to discuss advance care directives with patients and, if appropriate, their family and carers. End-of-life issues are relevant for patients with severe and moderate COPD; most patients with end-stage COPD wish to participate in end-of-life management decisions and would prefer to do so in a nonacute setting. For some patients, palliative care team involvement can be helpful.

Conclusion

To help reduce the numbers of hospitalisations due to COPD exacerbations in the colder winter months, general practitioners should ensure that each patient's usual COPD management is effective and appropriate, and that they are vaccinated against influenza, avoid exposure to cigarette smoking, participate in regular exercise and have a healthy diet and good nutritional state. Encouraging patients with COPD to pay particular attention to their respiratory symptoms, follow their self-management plan, seek early treatment for any decline in their condition and avoid exposure to other people with coughs and colds will also help reduce their risks of a severe exacerbation.

A checklist of the strategies recommended when reviewing patients with COPD is given in Table 4. MT

References

A list of references is available on request to the editorial office.

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COPD
preventing hospitalisations this winter

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