

This Guide aims to provide evidence-based practical recommendations for healthcare professionals on the diagnosis and management of chronic obstructive pulmonary disease (COPD).

COPD-X

Concise Guide for Primary Care



The Royal Australian
College of General
Practitioners

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Solving the COPD puzzle

Chronic disease management can be complex especially when managing multiple comorbidities. This diagram is a brief overview of an approach to COPD management...all the pieces are needed to “solve the puzzle”.

COPD is diagnosed by spirometry

- 20-30% of patients who have a clinical diagnosis do not have airflow limitation on spirometry
- COPD should be considered in anyone >35yrs with a history of smoking or occupational exposure to dust or gas/fumes

COPD patients should have annual influenza immunisations and pneumococcal immunisations as per the Immunisation Handbook

- Annual influenza immunisation
- Pneumococcal immunisation as per Immunisation Handbook

Reasons to refer to pulmonary rehabilitation

- Pulmonary rehabilitation is an exercise and education program that improves functional exercise capacity and quality of life
- Pulmonary rehabilitation reduces hospitalisations and subsequent inpatient bed days
- Pulmonary rehabilitation initiated shortly after discharge from hospital significantly reduces rates of re-hospitalisation
- Pulmonary rehabilitation improves self-management
- Regular weekly maintenance exercise programs will extend the benefits of pulmonary rehabilitation
- In areas where programs don't exist, refer to a physiotherapist or exercise physiologist for a home exercise program
- Refer to Lung Foundation Australia for educational resources

Offer smoking cessation support at every opportunity

Develop a GPMP with your patients

- Consider non-pharmacological and pharmacological management in the plan
- Prescribe the appropriate inhaled medicines based on symptoms and severity
- Ensure patients have their inhaler device technique and usage checked regularly
- Re-assess patients at least annually and 3 weeks after each exacerbation
- Detect, monitor and manage comorbidities in conjunction with COPD
- Have a pharmacist conduct a Home Medicine Review or Meds Check
- Refer patients to the Lung Foundation to be put into contact with patient support groups and educational resources

Develop a COPD Action Plan with your patients to recognise and treat exacerbations early
(available from Lung Foundation Australia)



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Introduction

This COPD-X Concise Guide for Primary Care aims to provide evidence-based practical recommendations for healthcare professionals on the diagnosis and management of COPD.

The need for this concise guide emerged from an appreciation that a wide range of healthcare professionals, including general practitioners, practice nurses, and allied healthcare workers require short, concise guidance on COPD management during daily practice.

Care has been taken to ensure that the levels of evidence and statements regarding the strength of these recommendations are clear. Information has been organised and presented to allow this guide to be incorporated into clinical practice.

The development of this guide was undertaken by a specially convened multi-disciplinary Writing Group in consultation with an Advisory Group. The full COPD-X guidelines (which are updated two times per year following a review of latest evidence) formed the basis of the evidence for this guide. Each recommendation from the COPD-X guideline was discussed by the committee and modified based on the latest evidence available and the need to provide practical recommendations. Submissions were also invited from key stakeholders and primary care representatives. The Lung Foundation's General Practice Advisory Group reviewed the guide to ensure it was practical and useful in the primary care setting.

Patients with COPD present at different stages of their disease process. In addition, COPD is typically a progressive disease marked by gradual decline in lung function and in many cases repeated exacerbations. Optimal chronic disease management should focus resources and educational activities on the individual needs of patients to enhance outcomes and encourage patients to actively participate in the management of their condition. Therefore, management must be reviewed regularly and tailored to the changing needs of patients. As much as possible, the recommendations contained in this guide accommodate the differences between individual patients in terms of disease severity, functional status, and suitability for different treatment options. Where relevant, the suitability of a recommendation for a particular group of patients is made clear.

Evidence levels in this companion guide refer to National Health and Medical Research (NHMRC) levels as outlined in the table below.

Practice Tips have been included throughout this Concise Guide to highlight areas where evidence has not yet been reviewed nor consensus to make a recommendation agreed, however the committee were satisfied that the Practice Tip could benefit diagnosis and management of COPD.

Recommendations were assessed using GRADE. The following legend should be referenced:

-  **SR** – Strong Recommendation
-  **WR** – Weak Recommendation
-  **HE** – High Quality Evidence
-  **ME** – Moderate Quality Evidence
-  **LE** – Low Quality Evidence

NHMRC level	Basis of evidence
I	Evidence obtained from a systematic review of all relevant randomised controlled trials.
II	Evidence obtained from at least one properly designed and conducted randomised controlled trial.
III-1	Evidence obtained from well-designed pseudorandomised controlled trials (alternate allocation or some other method).
III-2	Evidence obtained from comparative studies (including systematic reviews of such studies) with concurrent controls and allocation not randomised, cohort studies, case-control studies, or interrupted time series with a control group.
III-3	Evidence obtained from comparative studies with historical control, two or more single-arm studies, or interrupted time series without a parallel group.
IV	Evidence obtained from case series, either post-test or pre-test / post-test.

New evidence is constantly emerging and is systematically reviewed by the COPD-X Guidelines Committee after following the appropriate approval processes is added to www.copdx.org.au. However, this can be a lengthy process. Practice tips are intended to overcome this.

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Case finding and confirm diagnosis



Practice tip:

- Conduct risk assessment and screening (using Lung Foundation Australia's Lung Health Checklist and a COPD screening device such as the PiKo-6 or COPD-6) to target those patients who should have further spirometry testing.
- A practice nurse could assist the GP by undertaking screening activities and establishing a register of COPD patients.
- People with COPD can present with recurrent episodes of chest infections requiring antibiotics. Therefore this can be flagged as a means of case-finding.

Smoking is the most important risk factor in COPD development.

- A close relationship exists in people with COPD between the amount of tobacco smoked and the rate of decline in forced expiratory volume in one second (FEV₁), although individual susceptibility to tobacco smoke varies greatly [III-2].¹
- Smoking cessation can slow the rate of decline in lung function, delay the onset of disability, and preserve remaining lung function [III-2].¹⁻³
- Other COPD risk factors include host (e.g. genetics, age), asthma, socioeconomic, nutritional, and environmental factors (e.g. dusty occupations, air pollution).



Recommendation

- Consider COPD in:
 - patients > 35 years of age with symptoms such as breathlessness, cough, and / or sputum production⁴ **SR** **ME**
 - all smokers / ex-smokers > 35 years of age.⁴ **SR** **ME**
- Document smoking history, current smoking status, and work history including occupational exposure in all patients with suspected COPD. **SR** **LE**

- For further information on the causes, pathophysiology, and clinical features of COPD, see the [COPD-X guidelines \(C1. Aetiology and natural history\)](#).
- For further information on smoking cessation, see:
 - section *P - Prevent Deterioration* of this guide, or
 - the COPD-X guidelines (P1- Risk Factor Reduction), or
 - the RACGP guidelines on smoking cessation at www.racgp.org.au/your-practice/guidelines/smoking-cessation/
- For further information on community screening for COPD, see www.lungfoundation.com.au/health-professionals/clinical-resources/copd/targeted-copd-case-finding-using-copd-screening-devices-in-the-community/
- COPD Screening Results Form is available in rich text format for download into medical software from the above webpage.

A thorough history and examination is the first step in COPD diagnosis.

- All patients with suspected COPD should undergo a thorough history-taking that documents childhood respiratory symptoms, presence of allergy, onset of symptoms, triggers, occupational exposures, smoking history, and family history. Asthma can also be a risk factor for COPD.



Recommendation

- Document thorough history in all patients with suspected COPD. **SR** **LE**

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Case finding and confirm diagnosis *continued*

Practice tips:

- All patients with a diagnosis of COPD should have a post-bronchodilator spirometry test documented in their clinical record.
- There is some risk with spirometry of over diagnosis in older people or under diagnosis in younger people, especially when the FEV₁/FVC is close to 0.7. Consider referral for lung function testing at an accredited lung function testing laboratory if there is uncertainty, or the patient has difficulty performing the test.

COPD is confirmed by the presence of persistent airflow limitation (post-bronchodilator FEV₁/FVC < 0.7) [III-2].⁵

- The diagnosis of COPD requires spirometry to measure the presence of persistent airflow limitation (post-bronchodilator FEV₁/FVC < 0.7) since spirometry is the most reproducible and objective measurement of airflow limitation available.
- COPD cannot be diagnosed reliably on clinical features and/or chest x-ray findings alone.
- For simplicity, specific FEV₁ cut offs can be used to assess the severity of airflow limitation.
- Many patients with COPD have some reversibility of airflow limitation (mainly FEV₁) with bronchodilators. However, reversibility alone does not equate to a clinical diagnosis of asthma because the clinical features and pathophysiology of COPD and asthma overlap (and both conditions can coexist in some patients). Asthma can also be a risk factor for COPD.



Recommendation

- Spirometry should be performed using techniques that meet published standards. **SR** **LE**
- Perform pre- and post-bronchodilator spirometry to confirm COPD, which is characterised by airflow limitation that is not fully reversible (post-bronchodilator FEV₁/FVC ratio < 0.7 and FEV₁ < 80% predicted). **SR** **HE**
- Interpret borderline spirometry results with caution, particularly in older (> 65 years of age) and younger patients (< 45 years of age), or those without a history of smoking or exposure to occupational / environmental pollutants or dust. **SR** **ME**
- In patients with borderline spirometry, consider alternative diagnoses and investigate appropriately. **SR** **ME**



Practice tip:

- Conduct risk assessment and screening (using Lung Foundation Australia's Lung Health Checklist and a COPD screening device such as the PiKo-6 or COPD-6) to target those patients who should have further spirometry testing.

If FEV₁ increases > 400 mL following bronchodilator, consider asthma or asthma / COPD overlap [III-2].⁶

- An FEV₁ increase $\geq 12\%$ and ≥ 200 mL constitutes a positive bronchodilator response. An FEV₁ increase > 400 mL strongly suggests underlying asthma or asthma / COPD overlap [III-2].⁷
- Asthma and COPD may overlap. While a larger bronchodilator response may point to concurrent asthma or asthma/COPD overlap, a thorough history and further investigations may be needed to confirm this.

Recommendation

- If the FEV₁ response to bronchodilator is:
 - > 400 mL, strongly consider asthma or asthma / COPD overlap. **SR** **ME**
 - < 400 mL (but ≥ 200 mL and $\geq 12\%$), consider asthma / COPD overlap or an asthma component depending on history and pattern of symptoms. **WR** **LE**

- Further details on the interpretation of lung function tests can be found in the [COPD-X guidelines \(C4. Assessing acute response to bronchodilators\)](#).
- Further information on the diagnosis of asthma in adults can be found in the National Asthma Council Australia's "Australian Asthma Handbook" at www.nationalasthma.org.au/handbook

Further investigations may help a) confirm or exclude other conditions (either coexisting or with similar symptoms to COPD) and b) assess the severity of COPD.

- Investigations to confirm or exclude other conditions with a similar presentation to COPD may include chest x-rays, haematology / biochemistry, complex lung function tests, exercise stress testing, and electrocardiography (ECG) /echocardiography.
- In addition to spirometry, investigations to assess the impact of COPD include oximetry, arterial blood gas measurement (if SpO₂ <92% when stable or if hypercapnia is suspected), and cardiopulmonary exercise testing and cardiac stress testing (for prescribing exercise regimens, assessing safety of the patient for exercising and monitoring outcomes).

Recommendation

- Perform further investigations to:
 - confirm or exclude conditions with a similar presentation to COPD. **SR** **LE**
 - identify patients with severe COPD based on lung function as well as a careful assessment of symptoms and signs of hypoxaemia, hypercapnia, pulmonary hypertension, heart failure or polycythaemia. **SR** **LE**

- Further information on other investigations can be found in the [COPD-X guidelines \(C4.1 Confirm or exclude asthma\)](#).

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Case finding and confirm diagnosis *continued*



Practice tips:

- Consider arranging for a practice nurse to assist the patient in completing the CAT in readiness to review this with the managing GP.
- The CAT can be completed online or downloaded for free at www.catestonline.org.
- A guide to the severity of COPD is provided in Table 1. However, note that symptom severity may not correlate with spirometry criteria for severity. History of previous exacerbations may be the strongest predictor of future exacerbations and possible decline in lung function.⁸
- While frequency of exacerbations may increase with severity, exacerbation can occur at any stage of COPD.

Diagnosis of COPD should be accompanied by a regular assessment of severity.

- Severity of COPD should take into account lung function, effect of COPD symptoms on daily activities, level of breathlessness, and the presence of complications and/or comorbidities such as hypoxaemia, pulmonary hypertension, heart failure, or polycythaemia.
- The COPD Assessment Test (CAT) is not useful for diagnosing COPD but can determine the impact of COPD symptoms on wellbeing and daily life.



Recommendation

- To guide ongoing management, assess COPD severity based on lung function and a careful assessment of symptoms and signs, and review the history of exacerbations at least annually. SR ME

Table 1. Guide to the severity of COPD.⁵

	FEV ₁ (% predicted)	Symptoms	History of exacerbations	Comorbid conditions*	
COPD SEVERITY	Mild	60-80	<ul style="list-style-type: none"> ● Breathlessness on moderate exertion ● Recurrent chest infections ● Little or no effect on daily activities 	Frequency may increase with severity	Present across all severity groups ³
	Moderate	40-59	<ul style="list-style-type: none"> ● Increasing dyspnoea ● Breathlessness walking on level ground ● Increasing limitation of daily activities ● Cough and sputum production ● Exacerbations requiring corticosteroids and/or antibiotics 		
	Severe	< 40	<ul style="list-style-type: none"> ● Dyspnoea on minimal exertion ● Daily activities severely curtailed ● Experiencing regular sputum production ● Chronic cough 		

*common comorbid conditions include cardiovascular disease, skeletal muscle dysfunction, metabolic syndrome, osteoporosis, anxiety or depression, lung cancer, peripheral vascular disease and sleep apnoea.

Optimise function

Assessment is the first step to optimising function.

- A validated assessment tool is a convenient way to measure a baseline functional status.

✓ Recommendation

- Assess functional status and impact of COPD regularly either via traditional history taking / symptom checklists or using validated assessment tools such as the COPD Assessment Test (CAT - www.catestonline.org) and the Modified Medical Research Council (mMRC) Dyspnoea scale. SR ME



Practice tip:

○ Physical activity

- Physical activity includes normal daily activity as well as formal programs such as pulmonary rehabilitation services and Lung Foundation Australia's *Lungs in Action* program (entry criteria apply) - www.lungsinaction.com.au.
- Based on exercise guidelines, patients should aim to walk for at least 150 minutes/week (30 minutes/day, 5 days/week). Instruct patients to walk until they feel too breathless to continue, at which point they should take a short rest then resume walking [III-2].^{9,10}

○ Pulmonary rehabilitation

- Details of pulmonary rehabilitation services throughout Australia are available through Lung Foundation Australia (1800 654 301 or at www.lungfoundation.com.au/patient-area/resources/pulmonary-rehabilitation/pulmonary-rehabilitation-programs-2/)
- A rehabilitation fact sheet for patients can be downloaded at www.lungfoundation.com.au/patient-area/resources/pulmonary-rehabilitation/

Non-pharmacological strategies (such as pulmonary rehabilitation and regular exercise) should be provided to all patients with COPD.

- All patients with COPD can benefit from non-pharmacological strategies, including smoking cessation strategies [I, III-2], regular physical activity [III-2], and pulmonary rehabilitation [I], which includes exercise training as an essential component [I].^{1-3, 11-16} Smoking cessation pharmacotherapy is covered in section *P – Prevent deterioration* of this guide.
- Pulmonary rehabilitation has good evidence for multiple benefits (e.g. reduced dyspnoea and fatigue, decreased hospitalisation, improved exercise capacity, and quality of life) [I], with few adverse effects [I], and good cost-effectiveness [II].¹³⁻¹⁹
- Other important non-pharmacological strategies, such as self-management and support groups, are covered in *D – Develop a plan of care*.

✓ Recommendation

- Offer brief smoking cessation counselling and details for **Quitline (13 78 48)** as a minimum intervention at every visit to all smokers. SR HE
- Refer for pulmonary rehabilitation for all patients with exertional dyspnoea. SR HE
- Re-assess and consider re-referral to pulmonary rehabilitation for patients who have stopped being active. SR ME
- Encourage regular physical activity for all patients with COPD. SR ME

○ For further information on smoking cessation, see

- P - Prevent Deterioration* section of this guide
- COPD-X guidelines (P1. Risk Factor Reduction)
- the RACGP guidelines on smoking cessation at www.racgp.org.au/your-practice/guidelines/smoking-cessation/

- Further information on physical activity can be found in the Lung Foundation Australia's *Better Living with COPD: A Patient Guide* at www.lungfoundation.com.au/patient-area/resources/better-living-with-copd-a-patient-guide/

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Optimise function *continued*



Practice tips:

- High dose ICS may be associated with increased risk of pneumonia.
- Tailor medicines based on the patient's:
 - Symptoms
 - Exacerbation history
 - Response to treatment
 - Risk of side effects
- Inhaled Medicines Acronyms:
 - SABA = short-acting beta₂-agonist
 - SAMA = short-acting muscarinic antagonist
 - LABA = long-acting beta₂-agonist
 - LAMA = long-acting muscarinic antagonist (formerly known as anticholinergic)
 - ICS = inhaled corticosteroid

Optimise pharmacotherapy using a stepwise approach.

- The two core aims of pharmacological treatment are to (i) treat symptoms and (ii) reduce risk of severe exacerbations or deterioration.
- Choice of pharmacotherapy should take into account potential benefits, side-effects, cost of treatment and patient preference.
- Medicines should be introduced in a stepwise fashion (See Figure 1a, see page 9).
- Treatment goals, against which response can be evaluated, need to be determined in consultation with the patient/carer. These may include reduction of troublesome symptoms such as breathlessness and/or reduction of exacerbations.
- In meeting these aims, good evidence exists that:
 - short-acting beta₂-agonists (salbutamol, terbutaline) or short-acting muscarinic antagonists (ipratropium bromide) provide short-term relief of breathlessness [I].^{20, 21} Patients often benefit symptomatically from such inhaled bronchodilator therapy even if they do not demonstrate a short-term increase in FEV₁.
 - long-acting beta₂-agonists (salmeterol, eformoterol, indacaterol) or long-acting muscarinic antagonists (tiotropium, glycopyrronium, umeclidinium or aclidinium) may improve lung function, symptoms, quality of life, and exacerbation frequency [I-II].²²⁻²⁸
 - inhaled corticosteroids combined with long-acting beta₂-agonists (fluticasone propionate / salmeterol, budesonide / eformoterol, fluticasone furoate / vilanterol) may reduce exacerbation frequency^{29,30} and improve quality of life [I].³⁰
- Theophylline has a moderate effect on lung function in patients with moderate to severe COPD. Low-dose theophylline may also help restore sensitivity to inhaled corticosteroids and target eosinophilic airway inflammation [I-II].³¹⁻³³
- A long-acting muscarinic antagonist and long-acting beta₂-agonist in combination is better than either monotherapy [II].³⁴⁻³⁸
- Limited evidence suggests (and new evidence is being reviewed) that the use of a long-acting beta₂-agonist + inhaled corticosteroid + long-acting muscarinic antagonist provides more benefit than the individual treatments alone. This combination of therapies may be useful for patients with moderate-to-severe COPD with repeated exacerbations.^{39,40}
- The decision to alter pharmacotherapy should consider:
 - exertional dyspnoea
 - functional status
 - history of exacerbations
 - complexity of medicines or devices
 - patient preference
 - occurrence of adverse effects
- There is no fixed timeframe for assessment following alteration of pharmacotherapy. Approximately 6 weeks may be reasonable to assess symptoms such as dyspnoea although a longer period may be required to assess quality of life and the frequency of exacerbations.
- There is evidence for an increased risk of pneumonia for patients treated with inhaled corticosteroids + long-acting beta₂-agonists, however safety concerns should be balanced against the benefits of reduced rate of exacerbations and reduced decline in quality of life [I].⁴¹



Practice tip:

- Discontinue any LABA monotherapy once ICS/LABA combination has commenced.
- There are many new medicines now available. Ensure medicine classes are not duplicated when adding or changing medicines. Keep knowledge up to date by regularly referring to:
 - Stepwise Management of Stable COPD (see below)
 - Guide to Addition of Therapies table (see below)
 - COPD-X (www.copdx.org.au)



Recommendations (see Figure 1)

- For all symptomatic patients with COPD:
 - Follow a stepwise approach to pharmacological treatment until adequate control of breathlessness, functional capacity, and exacerbation frequency is achieved. **SR ME**
 - Use short-acting inhaled bronchodilator therapy for short-term relief of breathlessness. **SR HE**
- For patients receiving short-acting bronchodilators who have persistent troublesome dyspnoea, add a long-acting beta₂-agonist or long-acting muscarinic antagonist (or both in combination if monotherapy is not adequate) for regular use. **SR HE**
- LAMA/LABA fixed dose combinations in a single inhaler (glycopyrronium/indacaterol, umeclidinium/vilanterol, tiotropium/olodaterol, aclidinium/eformoterol) are available for patients who remain symptomatic despite monotherapy with either alone.
- For patients with FEV₁ < 50% predicted and ≥ 2 exacerbations in 12 months:
 - Initiate an inhaled corticosteroid + long-acting beta₂-agonist fixed dose combination and discontinue long-acting beta₂-agonist monotherapy. **SR HE**
 - For patients with moderate-to-severe COPD with frequent exacerbations who are not receiving a long-acting muscarinic antagonist, consider addition of a long-acting muscarinic antagonist to the inhaled corticosteroid + long-acting beta₂-agonist. **SR ME**
- For severe COPD (FEV₁ < 40% predicted), consider adding low-dose theophylline (100 mg twice daily)
- Avoid long-term (> 2 weeks) use of systemic corticosteroids. **SR LE**

Further information on pharmacological treatment options for COPD can be found in the COPD-X guidelines (O1. Inhaled bronchodilators to O4.2. Inhaled corticosteroids and long-acting beta₂-agonists and long-acting anticholinergics (antimuscarinics) in combination).

Figure 1a - See page 33 or [click here](#) to view a full page version of the current Stepwise Management of Stable COPD table.

Figure 1b - See page 34 or [click here](#) to view a full page version of the current Guide to Addition of Therapies table located on the reverse side of Stepwise Management of Stable COPD.

Figure 1a. Stepwise Management of Stable COPD

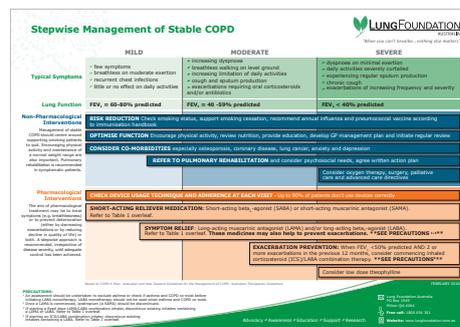


Figure 1b. Guide to Addition of Therapies table

Table 1: Guide to addition of therapies
Green tick indicates therapies that can be used together

	SABA	SABA	LAMA	LABA	LABA/LAMA	ICS/LAMA
SABA	✓	✓	✓	✓	✓	✓
LAMA	✓	✓	✓	✓	✓	✓
LABA	✓	✓	✓	✓	✓	✓
LABA/LAMA	✓	✓	✓	✓	✓	✓
ICS/LAMA	✓	✓	✓	✓	✓	✓
ICS/LAMA/LABA	✓	✓	✓	✓	✓	✓

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Optimise function *continued*



Practice tips:

- Before stepping up treatment, check medicine adherence and inhaler technique. Your nurse or a pharmacist can assist.

Adherence and inhaler technique need to be checked on a regular basis.

- Adherence with COPD management strategies involves patients' knowledge of their non-pharmacological and pharmacological treatment strategies, motivation, skill and physical ability with inhaler technique, health literacy, cost of medicines, willingness to pay, use of multiple inhalers and treatment for comorbidities.



Recommendation

- For all patients, check:
 - adherence with non-pharmacological (e.g. smoking cessation, immunisation, exercise and oxygen) and pharmacological treatment strategies regularly, preferably at each visit. **SR ME**
 - inhaler technique at each visit, especially in older, frail and cognitively impaired patients. **SR ME**
- Consider a home medicines review if adherence issues are more likely (e.g. multiple medicines, significant changes to medication, confusion, visual impairment). **SR ME**

- Videos of correct inhaler technique for a range of devices can be found on the National Asthma Council website at www.nationalasthma.org.au/content/view/548/984/
- Videos of inhaler devices are also available on the NPS Medicinewise website. www.nps.org.au/topics/how-to-be-medicinewise/managing-your-medicines/inhaler-devices-for-respiratory-medicines



Practice tips:

- Be alert to common comorbidities that may also impact on COPD and manage appropriately. These include:
 - cardiovascular disease (refer to www.strokefoundation.com.au/health-professionals/clinical-guidelines/guidelines-for-the-assessment-and-management-of-absolute-cvd-risk/)
 - anxiety/depression
 - osteoporosis (refer to osteoporosis guidelines www.racgp.org.au/your-practice/guidelines/musculoskeletal/osteoporosis/)
 - lung cancer (refer to www.canceraustralia.gov.au/publications-and-resources/cancer-australia-publications/investigating-symptoms-lung-cancer-guide-gps)
 - obstructive sleep apnoea

Comorbid conditions are common in patients with COPD.

- Patients with COPD are at risk of a wide range of comorbid conditions, including pneumonia, cardiovascular diseases, skeletal muscle loss or dysfunction, lung cancer, gastro-oesophageal reflux disease, diabetes mellitus, anxiety / depression, osteoporosis, obesity or malnutrition, sleep-related breathing disorders, and pulmonary hypertension.
- Some of these comorbid conditions may also influence the outcome of COPD.
- COPD may increase the overall morbidity and mortality in excess of that related to the primary diagnosis.
- Further information on these conditions and their management can be found in the COPD-X guidelines at COPD-X guidelines (07. Comorbidities)
- Links to other GP guidelines are available at: www.racgp.org.au/your-practice/guidelines

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Practice tip:

- In rural areas or other situations where specialist respiratory services are not available, referral to a general physician may be appropriate.
- Patients with a suspected sleep disorder (history of symptoms of snoring, witnessed apnoeas or excessive daytime sleepiness) should be referred to a specialist.

Referral to specialist respiratory services may be required.

Recommendation

- Refer patients to specialist respiratory services if there is diagnostic uncertainty or for particular indications such as assessment for oxygen therapy (see box below).

Table 2. Reasons to refer to specialist respiratory services

Reason prompting referral	Purpose of Referral
Diagnostic uncertainty and exclusion of asthma	Establish diagnosis and optimise treatment Obtain more detailed lung function testing
Unusual symptoms such as haemoptysis	Investigate cause including exclusion of malignancy
Rapid decline in functional performance	Optimise management and exclude other conditions
Persistent symptoms	Optimise management and exclude other conditions
Frequent chest infections (i.e. more than annually)	Assess preventable factors and rule out co-existing bronchiectasis, optimise treatment
Onset of ankle oedema	Assess for cor pulmonale and optimise treatment
Oxygen saturation, SpO ₂ <92% when stable (refer for assessment for long-term oxygen therapy: see page 23 for further details)	Optimise management, measure arterial blood gases and prescribe oxygen therapy if needed
Assessing suitability for pulmonary rehabilitation, if uncertain	Optimise treatment and refer to specialist or community-based rehabilitation service
Bullous lung disease on CXR or CT	Confirm diagnosis and refer to medical or surgical units for bullectomy if needed
COPD < 40 years of age	Establish diagnosis and exclude alpha1-antitrypsin deficiency
Persistent dyspnoea, marked hyperinflation, severe airflow limitation (refer for assessment for lung transplantation or lung volume reduction procedures)	Identify criteria for referral to transplant centres
Dyspnoea associated with chest tightness, anxiety or dizziness (refer for consideration of dysfunctional breathing*)	Establish diagnosis and refer for further investigation to exclude other causes of these symptoms
Daytime sleepiness, complaints by partner of heavy snoring	Assess for sleep disordered breathing and refer for sleep studies if needed

*imprecise term covering breathlessness, hyperventilation, chest tightness, paraesthesiae, anxiety, or dizziness.

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Prevent deterioration



Practice tips:

- Ensure the smoking status of each patient is recorded and up-to-date.
- Flag current smokers for brief smoking cessation advice or referral to local programs.
- A combination of pharmacological interventions and non-pharmacological strategies such as counselling and exercise improve effect.

Smoking cessation is the most important intervention to prevent worsening of COPD.

- Smoking cessation reduces the rate of decline in lung function [I].¹⁻³
- Smoking cessation advice from health professionals can increase quit rates [II].⁴² The major effect is to help motivate a quit attempt.⁴³
- Personalising smoking cessation advice based on lung age and the lung age calculator may increase cessation rates [III].⁴⁴
- Anxiety and depression are associated with high rates of smoking and reduce the likelihood of success of smoking cessation [III-2].⁴⁵
- Counselling combined with nicotine dependence therapy, bupropion, or varenicline is more effective than counselling alone [I-II].^{46, 47}
- In more nicotine dependent smokers, the combination of a nicotine patch with a rapid delivery form of nicotine replacement (e.g. gum) is more effective than one form alone [I].⁴⁸
- Based on a small number of trials, varenicline appears to have similar or marginally greater effectiveness than nicotine replacement therapy [II, III-2].^{49, 50}
- Hospitalisation represents an opportunity for initiating smoking cessation but interventions need to continue after discharge to have a significant effect [I].⁵¹



Recommendation

- For all smokers, offer brief counselling and details for **Quitline (13 78 48)** as a minimum intervention at every visit [I].⁵²  
- For smokers who continue to smoke, offer both counselling and nicotine dependence treatment provided there are no contraindications [I].⁵³  

- Best practice for brief smoking cessation counselling is summarised in the 5-A strategy:
 - **A**sk and identify smokers at every visit
 - **A**ssess the motivation to quit
 - **A**dvice about the risks of smoking and benefits of quitting
 - **A**ssist cessation
 - **A**rrange follow-up within a week of the quit date and one month after
- The RACGP's Smoking Cessation Guideline for Australian General Practice is available at www.racgp.org.au/your-practice/guidelines/smoking-cessation/
- A Lung Age Estimator that may help motivate smokers to quit is available at www.lungfoundation.com.au/health-professionals/clinical-resources/copd/primary-care-respiratory-toolkit/

Preventing exacerbations has a key role in preventing deterioration.

- Exacerbations tend to cluster. Therefore, a recent history of an exacerbation (within the last 12 months) is the greatest risk factor for a further exacerbation. (Refer *X – Manage eXacerbations* for definition of exacerbation and further information.)
- Frequent exacerbations lead to faster decline in FEV₁, impaired health status, and increased mortality (see Figure 2) [III-2].⁵⁴
- Prompt intervention for exacerbations improves recovery / quality of life and reduces hospitalisation [III-2].⁵⁵



Recommendation

- Optimise pharmacotherapy to reduce the risk of exacerbations.  
- Identify and treat patients with exacerbation symptoms early using increased doses of bronchodilators, antibiotics if infection is evident, and oral corticosteroids for moderate to severe exacerbations.  
- Implement written action plans to treat exacerbations early.  

- Specific advice on managing exacerbations is outlined in *X – Manage eXacerbations*.
- Further information regarding the effects of exacerbations on prognosis can be found in the full COPD-X guidelines (*X. Manage exacerbations*).

Prevent deterioration *continued*



Practice tip:

Practice nurses may assist by using recalls and reminders to ensure patient immunisations are up to date.

Immunisation reduces the risks associated with influenza and pneumococcal infection.

- Influenza immunisation reduces the risk of exacerbations, hospitalisation, and death in patients with COPD [I].^{56, 57}
- Pneumococcal polysaccharide vaccine, 23-valent (23vPPV; Pneumovax 23), produces significant immune responses in immunocompetent adults but there is no direct evidence supporting its efficacy in preventing exacerbations.⁵⁸

Recommendation

- Ensure all patients with COPD receive influenza vaccine immunisation. **SR ME**
 - Influenza: annual immunisation is strongly recommended and should be actively promoted in patients with COPD
- Pneumococcal vaccine (23vPPV) [III]:
 - For those with newly diagnosed COPD who have never received pneumococcal immunisation: a first dose of 23vPPV is recommended at diagnosis followed by up to two additional doses. For older adults who have already received an age-based first dose of 23vPPV at age 65 years (non-Indigenous) or 50 years (Indigenous), a single revaccination dose of 23vPPV is recommended a minimum of 5 years after the previous dose. **SR ME**
 - For those with pre-existing COPD: the first revaccination dose of 23vPPV is recommended at a minimum of 5 years after the most recent dose of 23vPPV, followed by a third dose at 65 years of age or five years after the previous dose, whichever is the later. **SR ME**

Further information on these immunisations and recommendations for their use can be found in the *Australian Immunisation Handbook* at www.immunise.health.gov.au

Table 3. Pneumococcal immunisations

		Initial 23vPPV dose (First dose)	First revaccination (Second dose)	Second revaccination (Third dose)
Not at increased risk of IPD*, non-smoker	Non-Indigenous	At 65yrs	No	
	Indigenous	At 50yrs	Yes, 5 years after first dose	
Smokers, newly diagnosed COPD, existing COPD, who have never received age-based dose	Non-Indigenous <65yrs	At diagnosis	Yes, 5 years after first dose	Yes, at 65yrs or 5 years after second dose (whichever is later)
	Indigenous <50yrs	At diagnosis	Yes, 5 years after first dose	Yes, at 50yrs or 5 years after second dose (whichever is later)
Smokers, newly diagnosed COPD, existing COPD, who have already received age-based dose	Non-Indigenous ≥65yrs		Yes, 5 years after first dose	No
	Indigenous ≥50yrs		Yes, 5 years after first dose	No

*invasive pneumococcal disease

**Practice tip:**

- In patients receiving optimal recommended therapy, the addition of mucolytic therapy is of uncertain benefit.

Mucolytics may benefit certain patients with COPD.

- A systematic review⁵⁹ and a large randomised controlled trial⁶⁰ showed high dose N-Acetylcysteine (≥ 600 mg oral, bd) reduced acute exacerbations in moderate to severe COPD.

✓ Recommendation

- In patients with moderate to severe COPD with at least one exacerbation in the past year, high dose oral N-Acetylcysteine* (≥ 600 mg oral, bd) should be considered to reduce exacerbations.  

*Not readily available in Australia

Long-term oxygen therapy has survival benefits for COPD patients with hypoxaemia

- Hypoxaemia is defined by $\text{PaO}_2 \leq 55$ mmHg or by $\text{PaO}_2 \leq 59$ mmHg plus evidence of polycythaemia, pulmonary hypertension or right heart failure [I, III-3].⁶¹⁻⁶⁸

✓ Recommendation

- For stable patients with possible persisting hypoxaemia (suggested by $\text{SpO}_2 < 92\%$ measured using a pulse oximeter), refer to specialist respiratory services to assess the need for oxygen therapy.  

- Further information on intermittent and nocturnal oxygen therapy can be found in the COPD-X guidelines (P10. Oxygen therapy)
- Clinical Use of Pulse Oximetry, Pocket Reference 2010 www.theipcr.org/download/attachments/689660/oximetry_pocket_guide.pdf?version=1&modificationDate=1347261955411

Develop a plan of care



Practice tip:

- Family members also experience significant psychological and physical consequences from the large 'burden of care' for patients with COPD.⁶⁹ Anxiety and depression have been shown to reduce quality of life in these carers [III-2].⁷⁰
- Practice nurses can be utilised to establish COPD patient registers and reminders and recall systems.



Practice tip:

- Within clinical software programs customise the basic GPMP/TCA to incorporate the relevant goals and tasks for the patient with COPD.
- Develop a written action plan to recognise and self-manage exacerbations where appropriate.

Good chronic disease care anticipates the wide range of needs in patients with COPD.

- COPD imposes burdens for both patients and carers.⁷¹⁻⁷³
- For patients, disability increases with COPD severity and is worsened by numerous complications and comorbid conditions.
- An individualised chronic disease care plan anticipates the wide range of episodic and long-term care needs of people with chronic diseases.
 - COPD multidisciplinary care incorporating elements such as exercise, self-management education and exacerbation management can improve exercise capacity and health-related quality of life, and reduce hospitalisation [I].^{74,75}
 - Developing a practice register of patients with COPD and ensuring it is updated assists the practice in providing systematic care.
- Good chronic disease care involves considering if the person is near the end of life, and planning accordingly (see *D-Accurate assessment of approaching end of life is difficult*).

Clinical support teams working with the primary healthcare team can help enhance quality of life and reduce disability for patients with COPD.⁷¹

- A clinical support team including healthcare professionals from a range of disciplines where available (such as nurse practitioners, practice nurses, dieticians, physiotherapists, exercise physiologists, community and specialist pharmacists, social workers, psychologists) should be involved in comprehensive management of patients with COPD and their comorbid conditions.
- A GP Management Plan (GPMP) and Team Care Arrangement (TCA) based on the agreed management goals of the patient and that includes a written COPD Action Plan is a practical method of enlisting this clinical support team.
- Patients, carers, and other family or friends should be engaged in the activities of the clinical support team.



Recommendation

- Consider developing a GP Management Plan (GPMP, Item 721) and a Team Care Arrangement (TCA, Item 723) in addition to organising a home medicines review with a pharmacist.
- Encourage all patients to involve carers and family members in their management (e.g. by attending consultations).

- Sample forms for GPMP (Item 721) and TCA (Item 723) are available from the Department of Health website at www.health.gov.au/internet/main/publishing.nsf/Content/mbsprimarycare-chronicdiseasemanagement
- The available members of the clinical support team depend on the context of practice (e.g. rural versus urban) and are outlined in further detail in the full COPD-X guidelines (D1. Support team)



Practice tip:

- Ensure regular medical review of patients who undertake self-management activities.
- Patients who self-manage well have improved quality of life and reduced hospitalisations.

Benefits of patient self-management support.

- 'Self-management support' is described as the healthcare and social-care services provided to individuals to enable them to take better care of themselves.
- Patient self-management support includes a range of initiatives (e.g. education, awareness programs, support groups) involving patients and health professionals and delivered via different modalities (e.g. face-to-face consultation, internet, TV, telephone) aimed at enabling patients to enhance the management of their health.⁷⁶
- In COPD, patient self-management support incorporating education and psychosocial support can improve health outcomes and reduce healthcare costs [II, III-2].⁷⁷⁻⁷⁹
- Self-management plans involving written action plans for exacerbation management and education and counselling strategies that incorporate disease and symptom management, emotional support, problem solving and decision making have been shown to improve health outcomes [I].⁷⁷
- Whilst self-management is effective, the types of patients for whom it is beneficial and the essential component of the intervention remain unclear.
- Caution is advised when considering patient suitability for self-management support. Evidence suggests that only patients who adhere to self-management plans receive benefits such as decreased exacerbation recovery time [III-2].⁸⁰ One study of US veterans found worse outcomes for patients who were randomly allocated to a comprehensive care program involving self-monitoring compared with those who received usual care [II].⁸¹
- Action plans can aid recognition of and response to exacerbations [I],⁸² but action plans should not replace comprehensive self-management plans that incorporate elements such as education and regular review for suitable patients.



Recommendation

- Provide self-management support to assist patients to set and achieve realistic goals and monitor their effectiveness in the context of regular review. **SR** **ME**
- Within the context of a self-management approach (that includes education and support) develop a written action plan in partnership with patients and significant others which indicates medicines, doses and actions to take for maintenance therapy and for exacerbations. **SR** **ME**

- Lung Foundation Australia provides a COPD Action Plan in editable pdf format, and as a rich text format for uploading into Medical Director® and Best Practice at www.lungfoundation.com.au/health-professionals/clinical-resources/copd/copd-action-plan/

Develop a plan of care *continued*



Practice tip:

- Provide patients with information on how to access support groups, and encourage them to attend.
- Provide patients with information on community support services relevant to their needs.
- *Lungs in Action* is the community-based exercise maintenance program for patients with stable chronic lung disease and stable chronic heart failure post-rehabilitation. Visit www.lungsinaction.com.au for a list of locations.

Benefits of support groups and other community support services.

- Support groups provide education and psychological support and are one aspect of patient self-management support.
 - Lung Foundation Australia operates an Australia-wide network of affiliated patient support groups, including in rural and remote areas.
- The Lung Foundation's Information and Support Centre can be contacted, free call on 1800 654 301 or via enquiries@lungfoundation.com.au for:
 - support group locations
 - pulmonary rehabilitation program locations
 - Lungs in Action program locations
 - links to other relevant services
 - clinical and patient resources.
- Further information on community support services can be found in the Lung Foundation Australia's *Better Living with COPD: A Patient Guide* available at www.lungfoundation.com.au/patient-area/resources/better-living-with-copd-a-patient-guide/

Accurate assessment of approaching end of life is difficult.

- Anticipatory care planning is a suggested approach that:
 - involves early engagement with palliative care services where available
 - anticipates which patients are at risk of dying in a relevant timeframe (e.g. 12 months).
 - develop a plan for a 'worst case' scenario (where deterioration to death may occur).
 - is appropriate when the patient is severely symptomatic, or has had multiple exacerbations in the last 12 months. Ask yourself, "Would I be surprised if the patient dies in the next 12 months?". This may assist in identifying individuals at risk of dying in the foreseeable future.
 - encourages proactive management for existing symptoms like chronic breathlessness, and treatments for likely severe complications like panic from severe dyspnoea.
 - also includes advance care planning and end-of-life discussions; ensuring there is a substitute decision-maker (formerly known as an enduring power of attorney (medical)) and adequate plans for out-of-hours exacerbations.
 - anticipates possible future requirements for assisted ventilation, high dependency or intensive care unit admission and initiates discussion about these with the patient to understand their wishes.
- For further information:
 - Lung disease specific Supportive and Palliative Care checklists – Lung Foundation Australia www.lungfoundation.com.au/health-professionals/supportive-and-palliative-care/
 - Advanced care planning and power of attorney information by state: Palliative Care Australia www.palliativecare.org.au/AboutPalliativeCare/AdvanceCarePlanning.aspx or www.advancereplanning.org.au

Manage eXacerbations

A COPD exacerbation is 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 or hospital admission.

- The greatest predictor of an exacerbation is a history of exacerbations as these events cluster in time and become more frequent as the severity of COPD worsens [I, III-3].⁸³⁻⁸⁵
- Exacerbations become more frequent with prior exacerbations, increasing COPD severity based on FEV₁ and other predictors (including history of heartburn, poorer quality of life and elevated white cell count) [I].^{83, 85}
- Triggers for exacerbations include viral or bacterial respiratory infection, left ventricular failure, psychosocial stressors and air pollution [III-2].^{86, 87}
- The role of bacterial infection is controversial as the lower airway is frequently colonised by *Haemophilus influenzae*, *Streptococcus pneumoniae* and *Moraxella catarrhalis* in patients with COPD [III-2, III-3].⁸⁸⁻⁹⁶
- Pulmonary embolism should be considered in patients who require hospitalisation for an acute exacerbation [I].⁹⁷

Recommendation

- Recognise the possibility of an exacerbation in all patients who experience an increase in symptoms, especially patients at increased likelihood of these events (prior exacerbation, more severe disease).  

Early diagnosis and treatment of exacerbations may prevent hospital admission and delay COPD progression.

- A delay (≥ 24 hours) in presentation for and initiation of treatment of an exacerbation doubles the chance of hospital admission [III-2].⁹⁸
- In contrast, early diagnosis and prompt management of exacerbations improve recovery / quality of life, reduce hospitalisation, and may prevent progressive functional deterioration [II, III-2].^{55, 78, 98, 99}
- Preventing COPD exacerbations is important as mortality increases with the frequency of exacerbations, especially if these require hospitalisation.¹⁰⁰
- Education of the patient, carers and significant others may aid in the early recognition of exacerbations and avoid the need for hospitalisation.
- An action plan can aid the recognition of, and response to, an exacerbation but needs to be combined with comprehensive self-management support and integrated care based on shared care to reduce hospitalisation [I].⁸²



Recommendation

- Diagnose and manage exacerbations promptly.  
- Educate patients and carers on how to recognise and respond to exacerbations by combining action plans with self-management education and integrated care based on shared care arrangements.  

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Manage eXacerbations *continued*



Practice tip:

- An action plan provides documentation and reminders of what medications are taken for stable disease and then what the patient should do for escalating symptoms (see section *D – Develop a plan of care*).
- As early initiation of treatment is crucially important, provide antibiotics and oral corticosteroids to selected patients with written action plans who have received self-management education. This way they can commence additional treatment promptly, while at the same time arranging for early medical review.



Practice tip:

- Some patients with an exacerbation of COPD who are being managed outside the hospital may benefit from a multi-disciplinary team approach including the use of community-based respiratory nurses.
- When selecting patients for home management, look for the following:
 - presence of ability to cope, good level of activity / general condition, social support, normal level of consciousness.
 - absence of cyanosis, rapid onset, worsening peripheral oedema, significant comorbidity, evidence of respiratory failure (e.g. pH \leq 7.35, SpO₂ < 90%).

Indications for hospitalisation of patients with COPD

- Marked increase in intensity of symptoms
- Patient has an exacerbation characterised by increased dyspnoea, cough or sputum production, plus one or more of the following:
 - Inadequate response to appropriate community-based management
 - Inability to walk between rooms when previously mobile
 - Inability to eat or sleep because of dyspnoea
 - Cannot manage at home even with homecare resources
 - High-risk comorbid condition (pulmonary or non-pulmonary)
 - Altered mental status suggestive of hypercapnia
 - Worsening hypoxaemia or cor pulmonale
 - Newly occurring arrhythmia
 - SpO₂ < 92%
- Lung Foundation Australia provides a COPD Action Plan in editable pdf format, and as a rich text format for uploading into Medical Director® and Best Practice at www.lungfoundation.com.au/health-professionals/clinical-resources/copd/copd-action-plan/

Multidisciplinary care may assist home management of some patients with an exacerbation.

- Some evidence suggests that multidisciplinary teams (where available) assisting GPs can safely and successfully treat carefully selected patients with COPD presenting with acute exacerbations of COPD, at home with support from respiratory nurses [I, II, IV].^{78, 99, 101-103}
- Assessment for suitability of home management should be made in consultation with the patient, general practice services, and hospital staff, if necessary.
- Contact your relevant Primary Care Network or your local hospital to determine what resources are available in your area to support management of patients at home.

**Practice tip:**

- For salbutamol, 4-8 puffs via MDI + spacer is equivalent to 2.5 mg by nebuliser.
- Advise patients to clean spacers with ionic detergent, no towelling.
- If acute inhaled bronchodilators are required more than 3-hourly, patients should be advised to seek medical attention.

Inhaled bronchodilators are effective for initial treatment of acute exacerbations.

- Adequate doses of bronchodilator delivered by metered dose inhalers (MDI) with a spacer are as effective as nebulisers [I].¹⁰⁴
- Limited evidence suggests dry powder inhalers are as effective as other delivery devices [III-2].¹⁰⁵

**Recommendation**

- In patients with exacerbations, prescribe increased doses of inhaled bronchodilator, such as:
 - Salbutamol (400 – 800 mcg), 4-8 puffs via MDI and spacer every 3-4 hours, titrated to response. **SR** **ME**
- Check that the patient can use the delivery device properly considering factors such as cognition, manual dexterity, and press and breathe co-ordination. **SR** **LE**

**Practice tip:**

- For periods up to 2 weeks, tapering of corticosteroid dose is unnecessary.

Systemic corticosteroids reduce the severity of and shorten recovery from exacerbations [I].¹⁰⁶

- Compared with intravenous corticosteroids, oral corticosteroids are more convenient, appear to be as rapid acting and are possibly more effective.¹⁰⁷

**Recommendation**

- In patients with exacerbations, prescribe oral corticosteroids (prednisolone 30-50 mg or equivalent, taken in the morning) for 5 days and then stop; tapering the dose should not be necessary¹⁰⁸. **SR** **HE**

Manage eXacerbations *continued*

Practice tip:

- A chest x-ray is not usually required in community-based management of exacerbations for most patients.
- Intravenous antibiotics are only required if there is impaired mental state, inability to swallow safely, or chest x-ray evidence of pneumonia in a patient ill enough to need hospitalisation. For recommendations regarding the suitability of other antibiotics for exacerbations, see the Therapeutic Guidelines, Respiratory www.tg.org.au/?sectionid=49.
- Sputum culture is not recommended routinely unless there is lack of response or repeated bacterial infections within several months.

Exacerbations with clinical features of infection (increased volume and change in colour of sputum and / or fever) benefit from antibiotic therapy [II, III-2].^{87, 109, 110}

- Extrapolation from data in asthma would suggest that bacterial infection may have a role in about half of exacerbations with *H. influenzae*, *S. pneumoniae* and *M. catarrhalis* being the most common causative organisms.
- P. aeruginosa* or *S. aureus* are more likely to be involved in patients with severely decreased lung function ($FEV_1 < 35\%$) [III-2, III-3].^{88, 89, 93 96, 109}
- Clinical response to treatment is typically seen in 3-5 days (but may take longer); a change of antibiotic should be considered if the response is inadequate.
- Inhaled corticosteroids, especially at high doses, are associated with an increased risk of pneumonia [I].^{41, 111}



Recommendation

- In patients with exacerbations and clinical features of infection, prescribe oral amoxicillin (500mg every 8 hours) or doxycycline (200mg orally, for the first dose, then 100mg daily) for 5 days. If the patient is not improving and the sputum culture grows a resistant organism a change in antibiotics should be considered. **SR** **HE**
- In patients with pneumonia manage according to the Therapeutic Guidelines, Antibiotic. **SR** **ME**

Controlled oxygen delivery (0.5-2.0 L/min) is indicated for hypoxaemia in patients with exacerbations [III-2].¹¹²

✓ Recommendation

- In patients with COPD and hypoxaemia, administer oxygen via nasal cannula at a rate of 0.5-2 L/min aiming for a SpO₂ of 88-92%. **SR ME**
- Avoid the use of high-flow oxygen in patients with COPD as this may lead to hypoventilation and acute respiratory failure. **SR ME**



Practice tip:

● Clinical features that suggest respiratory failure include confusion, drowsiness, restlessness, and cyanosis.

Non-invasive ventilation (NIV) is effective for patients with rising PaCO₂ levels [I].¹¹³

- NIV can reduce mortality, length of stay in hospital and the need for endotracheal intubation [I].¹¹²

✓ Recommendation

- In patients with an acute exacerbation, the following are indications for non-invasive ventilation:
 - Hypercapnia (PaCO₂ >45mmHg) and respiratory acidosis (blood pH <7.35). **SR HE**

Consider pulmonary rehabilitation at any time, including during the recovery phase following an exacerbation.

- Pulmonary rehabilitation that includes supervised exercise training can be safely initiated immediately following an exacerbation [I].¹⁸

✓ Recommendation

- In patients who have had an exacerbation, refer to pulmonary rehabilitation as soon as acute instability has resolved. **SR ME**

● Further information on pulmonary rehabilitation can be found in section *0 – Optimise function*.

Manage eXacerbations *continued*



Practice tip:

Post-discharge review items:

- Level of physical activity
- Referral for pulmonary rehabilitation
- Assess coping ability and strategies
- FEV₁ and performance status
- Medicine adherence and ability to use inhalation devices
- Review for optimal inhaled bronchodilator therapy as per “Stepwise Management of Stable COPD”
- Consider inhaled corticosteroid therapy if the patient has had >2 exacerbations in the last 12 months.
- Influenza and pneumococcal vaccination status
- Any persistent chest x-ray abnormality should be reviewed 4-6 weeks post-discharge
- Osteoporosis risk and management
- Assess future risk and prompt management of exacerbations
- Review COPD Action Plan
- Need for long-term oxygen therapy (see section *P – Prevent deterioration*) should be reviewed 4-6 weeks post discharge.

Patients with COPD discharged from hospital following an exacerbation should receive comprehensive follow-up led by the primary healthcare team.

- Individualised discharge plans may reduce hospital length of stay and readmission rates [I, II].^{114, 115}
- Integrated care approaches involving a discharge plan shared with the primary care team, case management, and self-management education reduce re-admissions for COPD exacerbations compared with usual care [II].^{116, 117}



Recommendation

- Hospital discharge plans should be shared with the primary care team in a timely manner (preferably within 24 hours of discharge). **SR** **LE**
- Patients with COPD discharged from hospital should be reviewed by a member of the primary healthcare team within 7 days of discharge. **SR** **LE**
- Patients discharged with chronic cough and ongoing sputum production should be monitored closely and taught airway clearance techniques if they have difficulties clearing secretions. **SR** **LE**

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Glossary

- **Action plan:** a written document to remind patients of their management in the stable phase, how to recognise that their condition has changed and what action to take if this occurs.
- **Chronic disease care:** a term to describe the activities and education carried out by healthcare professionals to help patients with chronic diseases including COPD better understand and live with their condition.
- **Clinical support team:** multidisciplinary team that can provide comprehensive management of COPD and comorbid conditions.
- **COPD Assessment Test (CAT):** questionnaire designed to measure the impact of COPD on a person's life, and how this changes over time.
- **Dyspnoea (also known as breathlessness or shortness of breath):** A subjective experience of breathing discomfort.
- **FEV₁:** Forced expiratory volume in one second. The volume of air that can forcibly be blown out in one second, after full inspiration. Normal values of FEV₁ are defined as anything above the 95th percentile or approximately 80% of predicted values. Predicted values are based on gender, height, age and ethnicity.
- **FEV₁/FVC:** Ratio of FEV₁ to FVC, can be expressed as a decimal fraction (e.g. 0.7) or a percentage. Ratio is decreased in obstructive diseases such as asthma and COPD due to increased airway resistance during expiration.
- **FVC:** Forced vital capacity. The volume of air that can forcibly be blown out after full inspiration.
- **GP Management Plan:** a written plan of management for one or more chronic diseases developed by the patient's usual GP in consultation with the patient (and / or their carer) that describes the patient's health problems and needs, treatment goals, and additional healthcare services required for optimal management.
- **Modified Medical Research Council Dyspnoea Scale:** The modified Medical Research Council breathlessness scale enables patients to choose a phrase that best describes their breathlessness. All the questions relate to everyday activities and are generally easily understood by patients.
- **Non-invasive ventilation (NIV):** a form of mechanical ventilation via a face or nasal mask that can safely and effectively treat ventilatory failure while allowing preservation of cough, physiological air warming and humidification, and normal swallowing, feeding and speech.
- **PaO₂:** Partial pressure of oxygen in arterial blood. A low PaO₂ indicates hypoxaemia.
- **Pulmonary rehabilitation:** a multidisciplinary and comprehensive intervention for patients with chronic respiratory disease designed to improve symptoms and functional status.
- **SaO₂:** Saturation level of oxygen in arterial haemoglobin measured by arterial sampling and used as an indication of hypoxaemia.
- **SpO₂ (pulse oximeter oxygen saturation):** an indirect or non-invasive measure of arterial oxyhaemoglobin saturation. SpO₂ may be an unreliable measure of SaO₂ if there is poor circulation, or nail polish is used.
- **Self-management:** Describes the various activities that patients carry out themselves to manage their condition.
- **Self-management support:** the systematic provision of education and supportive interventions by healthcare staff to increase patients' skills and confidence in managing their health problems.
- **Team Care Arrangement:** Provides care from a multidisciplinary team of a GP and at least two other healthcare providers for patients with at least one chronic or terminal medical condition. Medicare rebates are available to the patient for up to a total of 5 services per calendar year provided by the allied health team members if the team care arrangement is organised as part of a GP management plan.

Modified Medical Research Council Dyspnoea Scale ¹¹⁸

Grade	
0	"I only get breathless with strenuous exercise"
1	"I get short of breath when hurrying on the level or walking up a slight hill"
2	"I walk slower than people of the same age on the level because of breathlessness or have to stop for breath when walking at my own pace on the level"
3	"I stop for breath after walking about 100 yards or after a few minutes on the level"
4	"I am too breathless to leave the house" or "I am breathless when dressing"

NB: This is the modified MRC scale that uses the same descriptors as the original MRC scale in which the descriptors are numbered 1-5.

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Stepwise Management of Stable COPD

	MILD	MODERATE	SEVERE
Typical Symptoms	<ul style="list-style-type: none"> few symptoms breathless on moderate exertion recurrent chest infections little or no effect on daily activities 	<ul style="list-style-type: none"> increasing dyspnoea breathless walking on level ground increasing limitation of daily activities cough and sputum production exacerbations requiring oral corticosteroids and/or antibiotics 	<ul style="list-style-type: none"> dyspnoea on minimal exertion daily activities severely curtailed experiencing regular sputum production chronic cough exacerbations of increasing frequency and severity
Lung Function	FEV ₁ ≈ 60-80% predicted	FEV ₁ ≈ 40 -59% predicted	FEV ₁ < 40% predicted
Non-Pharmacological Interventions	<p>RISK REDUCTION Check smoking status, support smoking cessation, recommend annual influenza and pneumococcal vaccine according to immunisation handbook</p> <p>OPTIMISE FUNCTION Encourage physical activity, review nutrition, provide education, develop GP management plan and initiate regular review</p> <p>CONSIDER CO-MORBIDITIES especially osteoporosis, coronary disease, lung cancer, anxiety and depression</p> <p>REFER TO PULMONARY REHABILITATION and consider psychosocial needs, agree written action plan</p> <p>Consider oxygen therapy, surgery, palliative care and advanced care directives</p>		
Pharmacological Interventions	<p>CHECK DEVICE USAGE TECHNIQUE AND ADHERENCE AT EACH VISIT - Up to 90% of patients don't use devices correctly</p> <p>SHORT-ACTING RELIEVER MEDICATION: Short-acting beta₂-agonist (SABA) or short-acting muscarinic antagonist (SAMA). Refer to Table 1 overleaf.</p> <p>SYMPTOM RELIEF: Long-acting muscarinic antagonist (LAMA) and/or long-acting beta₂-agonist (LABA). Refer to Table 1 overleaf. These medicines may also help to prevent exacerbations. **SEE PRECAUTIONS 1-3**</p> <p>EXACERBATION PREVENTION: When FEV₁ <50% predicted AND 2 or more exacerbations in the previous 12 months, consider commencing inhaled corticosteroid (ICS)/LABA combination therapy. **SEE PRECAUTIONS**</p> <p>Consider low dose theophylline</p>		

Based on COPD-X Plan: Australian and New Zealand Guidelines for the Management of COPD; Australian Therapeutic Guidelines.

PRECAUTIONS:

- 1 An assessment should be undertaken to exclude asthma or check if asthma and COPD co-exist before initiating LABA monotherapy. LABA monotherapy should not be used when asthma and COPD co-exist.
- 2 Once a LABA is commenced, ipratropium (a SAMA) should be discontinued.
- 3 If starting a fixed dose LAMA/LABA combination inhaler, discontinue existing inhalers containing a LABA or LABA. Refer to Table 1 overleaf.
- 4 If starting an ICS/LABA combination inhaler, discontinue existing inhalers containing a LABA. Refer to Table 1 overleaf.

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