Précis of the COPD clinical guidelines
(The ‘even more concise’ guide to COPD)

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Guidance on the management of COPD in primary care is provided in this summary of recommendations made in the current Australian COPD-X guidelines.

KEY POINTS

- COPD, a common, complex, chronic disease, is associated with significant morbidity and mortality.
- Simple COPD screening devices may help in determining patients who should proceed to formal spirometry, which is essential to confirm a COPD diagnosis.
- Smoking cessation is key in preventing COPD and improves prognosis.
- Pharmacological and nonpharmacological therapies can improve symptoms, quality of life and exercise capacity and reduce exacerbations.
- Comorbidities are common in patients with COPD and require targeted treatment, ideally through an individualised chronic disease care plan.
- Exacerbations require prompt treatment to prevent progressive functional deterioration and the likelihood of hospitalisation and death.

Chronic obstructive pulmonary disease (COPD) is a disease of global importance, and is estimated to cost over $8 billion in direct health care expenditure annually in Australia. It is a chronic lung disease characterised by persistent airflow limitation that is not fully reversible. It is also a complex disease, with multiple aetiological factors, clinical clusters and associated multimorbidities. Exacerbations and progressive decline in lung function contribute to worsening quality of life.

Lung Foundation Australia together with The Thoracic Society of Australia and New Zealand have produced a suite of COPD clinical guidelines to enhance clinical care for patients with COPD. The COPD-X guidelines provide the detailed
evidence base for the new publication, *COPD-X Concise Guide for Primary Care*.2,3 Included in both publications is the *Stepwise Management of Stable COPD*, a focused one-page guide to nonpharmacological and pharmacological interventions (see page 33).

This article is a précis of the current COPD guidelines. Given the ever-changing field of COPD management, we invite interested clinicians to view updates to the guidelines online (see the list of online resources on COPD in Box 1).

**Case finding and confirm diagnosis**

**Risk factors for COPD**

Smoking is the most important risk factor for the development of COPD. Other risk factors include those related to the host (e.g. older age, genetic influences, impaired lung growth during childhood), socioeconomics, nutrition and environment (e.g. dusty occupations, outdoor or indoor air pollution). Chronic asthma is also an important risk factor for COPD.

**Symptoms**

COPD should be considered as a diagnosis in patients aged 35 years or older who have breathlessness, cough or sputum production, reduced activity levels and impaired exercise tolerance,4 especially those with a smoking history or relevant occupational exposure. COPD should also be considered in patients with recurrent chest infections.

**Spirometry**

The Lung Foundation’s Lung Health Checklist (see Box 1) and a COPD screening device (such as the PiKo-6 or Vitalograph COPD-6) can help with case finding to target patients who should have spirometry testing.

Spirometry, performed using reproducible techniques, is the gold standard test to diagnose the chronic airflow obstruction that defines COPD. COPD is confirmed by the presence of persistent airflow limitation that is not fully reversible (postbronchodilator ratio of forced expiratory volume in 1 second to forced vital capacity [FEV1/FVC ratio] <0.7). Although respiratory symptoms and hyperinflation shown on a chest x-ray may suggest the possibility of COPD, these features alone do not reliably diagnose COPD.

Using the FEV1/FVC ratio cut off of <0.7 may overdiagnose airflow obstruction in older patients and, conversely, may

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**1. ONLINE COPD RESOURCES**

Lung Health Checklist

COPD-X Guidelines, Concise Guide for Primary Care and Stepwise Management for Stable COPD
http://copdx.org.au

COPD Action Plan

DVD – Better Living with Your Lung Disease

Better Living with COPD – A Patient Guide

Pulmonary rehabilitation information

Inhaler technique fact sheets

National Asthma Council how-to videos for inhaler technique

COPD Assessment Test
www.catestonline.org

Australian Immunisation Handbook
underdiagnose this in younger patients. If spirometry results are borderline or if there is any doubt about the diagnosis, patients should be referred for definitive lung function testing. Alternative tests and diagnoses should also be considered.

**Differential diagnoses**

When weighing up the differential diagnosis of COPD, asthma is suggested by more variable symptoms of breathlessness, wheeze, chest tightness and cough, and by the presence of bronchodilator reversibility (an increase in FEV₁ of >12% and >200 mL with salbutamol). Nevertheless, many features of COPD and asthma overlap.

Additional investigations can assist in differentiating COPD from other causes of breathlessness. These include a chest x-ray (for other pulmonary, pleural or cardiac conditions), an ECG and an echocardiogram (for cardiac conditions) and blood tests (e.g. for anaemia).

**Severity of COPD**

The severity of COPD can be classified by the degree of airflow obstruction (Table), as well as symptom severity and frequency of exacerbations. The COPD Assessment Test (see Box 1) and modified Medical Research Council questionnaire measure the impact of COPD in a range of domains, assisting with assessment of COPD severity and determining the personal impact of the disease on the patient. Respiratory failure (hypoxaemia, hypercapnia) and the presence of pulmonary hypertension or right heart failure are features suggestive of severe COPD.

**Optimise function**

Function of the patient with COPD is optimised by both nonpharmacological and pharmacological interventions.

**Nonpharmacological interventions**

Smoking cessation (see the section below ‘Prevent deterioration’), pulmonary rehabilitation and regular physical activity are beneficial for patients with COPD. Education and self-management strategies are useful (see the section below ‘Develop a plan of care’).

Pulmonary rehabilitation consists of a co-ordinated program of exercise and education, typically lasting eight weeks. There is strong evidence for benefits from pulmonary rehabilitation, including reduced dyspnoea and fatigue, decreased rates of hospitalisation, improved exercise capacity and quality of life and good cost-effectiveness. Information about accessing pulmonary rehabilitation can be found on the Lung Foundation Australia website (see Box 1). Ongoing exercise maintenance programs, such as ‘Lungs in Action’ after pulmonary rehabilitation, are also important (Figure).

**Pharmacological interventions**

Inhaled medicines target the pathophysiology of COPD. These therapies are introduced in a stepwise manner to treat symptoms and to reduce risk of exacerbations and deterioration. First, to treat chronic airflow limitation, bronchodilators are used both as relievers and for maintenance therapy to reduce breathlessness and prevent exacerbations. Second, in patients with more severe disease and frequent exacerbations, inhaled corticosteroids (ICSs) can be added to long-acting bronchodilators to prevent exacerbations and improve quality of life.

To determine how long a trial of therapy needs to be, consideration should be given to the aims of treatment. If the treatment trial is aimed at symptom relief only (for example, in those who do not suffer exacerbations), a trial of a month or so of therapy may be adequate to determine benefit. However, if there is an expectation that the treatment may prevent exacerbations, the treatment trial logically would need to be for several months (or longer), depending...
# Stepwise Management of Stable COPD

## Typical Symptoms

- Few symptoms
- Breathless on moderate exertion
- Recurrent chest infections
- Little or no effect on daily activities

## Lung Function

### FEV₁

- **MILD**: FEV₁ ≈ 60-80% predicted
- **MODERATE**: FEV₁ ≈ 40 -59% predicted
- **SEVERE**: FEV₁ < 40% predicted

### RISK REDUCTION

- Check smoking status, support smoking cessation, recommend annual influenza and pneumococcal vaccine according to immunisation handbook

### OPTIMISE FUNCTION

- Encourage physical activity, review nutrition, provide education, develop GP management plan and initiate regular review

### CONSIDER CO-MORBIDITIES

- Especially osteoporosis, coronary disease, lung cancer, anxiety and depression

### NON-PHARMACOLOGICAL INTERVENTIONS

- Management of stable COPD should centre around supporting smoking patients to quit. Encouraging physical activity and maintenance of a normal weight range are also important. Pulmonary rehabilitation is recommended in symptomatic patients.

### PHARMACOLOGICAL INTERVENTIONS

- The aim of pharmacological treatment may be to treat symptoms (e.g., breathlessness) or to prevent deterioration (either by decreasing exacerbations or by reducing decline in quality of life) or both. A stepwise approach is recommended, irrespective of disease severity, until adequate control has been achieved.

### CHECK DEVICE USAGE TECHNIQUE AND ADHERENCE AT EACH VISIT

- Up to 90% of patients don’t use devices correctly

### SHORT-ACTING RELIEVER MEDICATION

- Short-acting beta₂-agonist (SABA) or short-acting muscarinic antagonist (SAMA). Refer to Table 1 overleaf.

### 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**

### EXACERBATION PREVENTION

- When FEV₁ <50% predicted AND 2 or more exacerbations in the previous 12 months, commence inhaled corticosteroid (ICS)/LABA combination therapy. **SEE PRECAUTIONS***

### PRECAUTIONS:

1. An assessment should be undertaken to exclude asthma or Asthma-COPD Overlap before initiating LABA monotherapy. LABA monotherapy should not be used in asthma or Asthma-COPD Overlap.
2. Once a LAMA is commenced, ipratropium bromide (a SAMA) should be discontinued.
3. If starting a fixed dose LAMA/LABA combination inhaler, discontinue existing inhalers containing a LAMA 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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Based on COPD-X Plan: Australian and New Zealand Guidelines for the Management of COPD, Australian Therapeutic Guidelines.
Table 1: Guide to addition of therapies*

<table>
<thead>
<tr>
<th>Red boxes with crosses indicate classes of therapies that should not be used together.</th>
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<tbody>
<tr>
<td><strong>SABA</strong></td>
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<tr>
<td>----------------</td>
</tr>
<tr>
<td>Salbutamol (Ventolin™, Airomir™, Asmol™)</td>
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<td>Terbutaline (Bircanyl™)</td>
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<td>Laba/Lama</td>
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<td>ICS/LABA</td>
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Notes:
- HandiHaler, Breezhaler and Aerolizer devices require a capsule to be loaded into the device. All other devices are preloaded.
- LABA monotherapy unsuitable for patients with Asthma or Asthma-COPD Overlap.

Flare Up Medicines
1. Antibiotics
2. Oral steroids (Prednisone, Prednisolone)

Visit [www.lungfoundation.com.au](http://www.lungfoundation.com.au) and click on Health Professional to find out more or call us on 1800 654 301 to order copies.
on the historical exacerbation frequency. As inhaled medicines are added or substituted, care should be taken not to ‘double-up’ inadvertently on medicines within the same class (see ‘Guide to Addition of Therapies’ in the Stepwise Management of Stable COPD, on page 34.

**Bronchodilators**

**Short-acting bronchodilators.** Short-acting β₂-agonists (salbutamol or terbutaline) are used as short-term relievers of breathlessness in patients at any stage of COPD. The short-acting muscarinic antagonist, ipratropium, is now used less often because it has a slower onset of action.

**Long-acting bronchodilators.** The long-acting muscarinic antagonist (LAMA) inhalers provide bronchodilation and are given once daily (tiotropium, glycopyrronium, umeclidinium) or twice daily (aclidinium). All are available on the PBS. LAMAs reduce dyspnoea, improve quality of life and decrease risk of exacerbations.¹³⁻¹⁵ Tiotropium has been shown to slow the rate of decline of lung function to a small extent and, possibly, to reduce mortality.¹⁶⁻¹⁷

The long-acting β₂-agonist (LABA) inhalers provide bronchodilation, and are given once daily (indacaterol; available on the PBS) or twice daily (salmeterol, eformoterol). LABAs improve lung function¹⁸ and quality of life, and reduce risk of exacerbations.¹⁹⁻²⁰

Either a LAMA or LABA inhaler can be commenced if breathlessness in a patient persists despite the use of a short-acting reliever. Fixed-dose combination LAMA/LABA inhalers in a single inhaler device (once daily glycopyrronium/indacaterol, umeclidinium/vilanterol, tiotropium/olodaterol; twice daily aclidinium/eformoterol) are available through a PBS streamlined authority script. The indication for this dual bronchodilation is for patients with moderate to severe COPD who have been stabilised on a combination of separate LAMA and LABA inhalers. LAMA/LABA fixed dose combination inhalers should not be used as first-line therapy.

**Anti-inflammatory agents**

**Inhaled corticosteroid/long-acting beta₂-agonist (ICS/LABA) combination inhalers.** ICS/LABA combination inhalers can be prescribed through the PBS for use in patients with moderate to severe COPD (FEV₁ < 50% predicted) who have a history of repeated exacerbations and have significant symptoms despite regular β₂-agonist bronchodilator therapy. ICS/LABA combination inhalers are given twice daily (fluticasone propionate/salmeterol, budesonide/eformoterol) or once daily (fluticasone furoate/vilanterol).

The airway inflammation in COPD is generally less corticosteroid-responsive than asthma. Nevertheless, ICSs have been shown to reduce risk of exacerbations, and to slow the rate of decline of quality of life,²¹ especially when given in an ICS/LABA combination. They may also potentially slow the rate of decline of lung function and possibly reduce mortality.²²⁻²⁵ ICSs may increase the risk of pneumonia in patients with COPD.²¹,²⁶

There is currently considerable debate about the exact role of ICSs in the management of COPD. If withdrawal of an ICS is considered due to complications or lack of benefit, then withdrawal should be tapered and dual bronchodilation used.²⁷

**Inhaler adherence and technique**

Patients often have suboptimal technique using their inhalers, of which there are now many types and individual patient preferences.²⁸ Both the patient’s inhaler technique and their adherence to medication should be checked at each health professional visit, with direct coaching provided whenever appropriate. The National Asthma Council website has useful ‘How To’ videos to demonstrate inhaler technique (see Box 1).

**Prevent deterioration**

**Smoking cessation**

It is imperative that patients with COPD stop smoking. Smoking cessation is key in preventing worsening of COPD and, importantly, slows the rate of decline in lung function and reduces mortality.²⁹⁻³⁰ Although some smokers are able quit ‘cold turkey,’ smoking cessation advice from health professionals increases quit rates.³¹ Anxiety and depression are associated with high rates of smoking and reduce the likelihood of success of smoking cessation.³² For those who are unable to quit, counselling combined with nicotine replacement therapy, bupropion or varenicline is more effective than counselling alone.³³⁻³⁴ Personalised smoking cessation advice based on lung age and the Lung Age Estimator (see Box 1) may increase cessation rates.³⁵ In smokers who are more nicotine-dependent, the combination of a nicotine patch with a rapid delivery form of nicotine replacement therapy (for example, gum or lozenges) is more effective than one form alone.

**Immunisation**

Annual influenza vaccination is recommended for all patients with COPD. It
reduces exacerbations and may reduce hospitalisations and death.\textsuperscript{36,37} The pneumococcal vaccine produces significant responses in immunocompetent adults (Australian Immunisation Handbook; see Box 1)\textsuperscript{38} and is also recommended in patients with COPD, although there is no direct evidence supporting its efficacy in preventing exacerbations.

**Mucolytics**

Some patients with COPD find mucolytics helpful in easing expectoration of sputum. There is some evidence that these agents (although not those currently available in Australia) reduce exacerbations, particularly in patients who are not also receiving an ICS.\textsuperscript{39,40}

**Long-term oxygen therapy**

Maximally treated, patients with stable COPD and persistent hypoxaemia (partial pressure of oxygen [PaO\textsubscript{2}] ≤55 mmHg or PaO\textsubscript{2} ≤59 mmHg plus evidence of polycythaemia, pulmonary hypertension or right heart failure) may benefit from the provision of domiciliary oxygen. Long-term continuous treatment (>18 hours/day) with oxygen therapy has been shown to improve survival in such patients.\textsuperscript{41} Patients with stable COPD and with a persistently low oxygen saturation (SpO\textsubscript{2}) as measured by pulse oximetry (SpO\textsubscript{2} <92%) warrant consideration of specialist respiratory service referral to assess the need for home oxygen therapy.

**Develop a plan of care**

For patients with COPD, disability increases with COPD severity and is worsened by complications and comorbidities. An individualised chronic disease care plan can help by anticipating the episodic and long-term care needs of patients with COPD. COPD multidisciplinary care incorporating exercise, self-management education and exacerbation management can both improve exercise capacity and quality of life and reduce hospitalisation.\textsuperscript{42,43}

The clinical support team includes a range of healthcare professionals such as nurse practitioners, practice nurses, dietitians, physiotherapists, exercise physiologists, community and specialist pharmacists, social workers and psychologists. Such teams can enhance quality of life and reduce disability for patients with COPD.\textsuperscript{44} Comprehensive management of patients with COPD should be considered in patients with complex disease and comorbidities. GP Management Plans (GPMP Item 721) and Team Care Arrangements (TCA Item 723), based on the agreed management goals of the patient, are practical methods of enlisting a clinical support team. A written COPD action plan should be discussed and included in the Management Plan. Carers and family members should be involved in this process.

Patient self-management support includes a range of initiatives such as education, awareness programs and support groups involving patients and health professionals. Support can be delivered via multiple modalities: face-to-face consultation, internet, TV and telephone. 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.\textsuperscript{45}

Caution is advised when considering patient suitability for self-management support. Evidence suggests that only those who adhere to self-management plans derive benefits such as decreased exacerbation recovery time.\textsuperscript{46} Action plans can aid recognition of, and response to, exacerbations,\textsuperscript{47} but they should not replace comprehensive self-management plans that incorporate elements such as education and regular review for suitable patients.

It is difficult to accurately assess end of life timing in patients with COPD. If you would not be surprised if your patient were to die in the next 12 months or if your patient is severely symptomatic and troubled by frequent exacerbations, referral to a palliative care service may be appropriate.

Anticipatory care planning seeks to identify such patients and foster early engagement with palliative care services. Proactive management of disabling symptoms such as severe dyspnoea with oral opioids may be helpful.\textsuperscript{48} Advance care planning and end-of-life discussions should also be carefully considered.

**Manage exacerbations**

A COPD exacerbation is characterised by an increase in the patient’s dyspnoea, cough and/or sputum beyond the normal variation in daily symptoms, is acute in onset and may warrant a change in regular medication or hospital admission. A past history of exacerbations is the best predictor of subsequent exacerbations. Hospitalisation for an acute exacerbation of COPD can be considered as a sentinel event. It is not generally realised that a patient who is hospitalised for an exacerbation of their COPD is at greater risk of dying in the next 12 months than a patient suffering a myocardial infarction.\textsuperscript{49} Patients with more severe COPD (based on FEV\textsubscript{1}) are prone to more frequent exacerbations.\textsuperscript{50}

The usual triggers for exacerbations include viral or bacterial respiratory...
infection, left ventricular failure, psycho-social stressors and air pollution.\textsuperscript{31,32} Pulmonary embolism should be considered in patients who require hospitalisation for an acute exacerbation but do not have the typical symptoms of infection.\textsuperscript{33}

Early diagnosis and prompt management of exacerbations improves recovery and quality of life, reduces hospitalisation and may prevent progressive functional deterioration.\textsuperscript{54-57} Preventing COPD exacerbations is important, as mortality increases and quality of life decreases with the frequency of exacerbations. An action plan can help patients and carers recognise and respond to the early signs of an exacerbation. Indications for hospitalisation of patients with COPD are listed in Box 2.

Pharmacological management of exacerbations
Increased doses of inhaled bronchodilator, such as salbutamol four to eight puffs (400 to 800 \textmu g) via metered dose inhaler (MDI) and spacer every three to four hours, should be prescribed for exacerbations of COPD, and are as effective in this form as via nebuliser.\textsuperscript{38} Oral prednisolone 30 to 50 mg should be taken in the morning for five days and then stopped; tapering the dose is rarely necessary.\textsuperscript{39} Patients with exacerbations with clinical features of infection (increased volume and change in colour of sputum and/or fever) benefit from antibiotics. Oral amoxycillin (500 mg every eight hours) or doxycycline (200 mg orally for the first dose then 100 mg daily) for five days are appropriate first-line agents.

If hypoxaemia is present, oxygen should be administered via nasal cannula at a rate of 0.5 to 2 L/minute, aiming for an oxygen saturation (SpO\textsubscript{2}) of 88 to 92%. Patients with hypercapnia (PaCO\textsubscript{2} >45 mmHg) and respiratory acidosis (blood pH <7.35) on arterial blood gas sampling should be treated in hospital with noninvasive ventilation (NIV). NIV can reduce mortality, length of stay in hospital and the need for endotracheal intubation.\textsuperscript{40}

A member of the primary healthcare team should ideally review patients within seven days of hospital discharge to reinforce all aspects of COPD management during this critical period (see the Concise Guide for a post-discharge checklist).\textsuperscript{1} The discharge plan should be shared with the primary care team and patients should receive self-management education. Patients should be referred for pulmonary rehabilitation after the acute instability has resolved to reduce readmission rates and improve quality of life.\textsuperscript{36}

Conclusion
COPD is a common, complex, chronic disease, with multiple aetiological factors, clinical clusters and associated multimorbidities. It is associated with significant morbidity and mortality. Simple COPD screening devices may assist in determining who should proceed to formal spirometry, which is required to confirm the diagnosis. Smoking cessation is key in managing COPD and improves prognosis. Pharmacological and nonpharmacological therapy can improve symptoms, quality of life and exercise capacity and reduce exacerbations. Comorbidities are common and require targeted treatment, ideally through an individualised chronic disease care plan. Exacerbations require prompt treatment to prevent progressive functional deterioration and the likelihood of hospitalisation and death. Oxygen therapy in those who are hypoxaemic may reduce mortality.

The online resources listed in Box 1 should assist in diagnosing and managing COPD.

Acknowledgements
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References
A list of references is included in the website version (www.medicinetoday.com.au) of this article.

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