



Managing stable chronic obstructive pulmonary disease

Focusing on inhalers



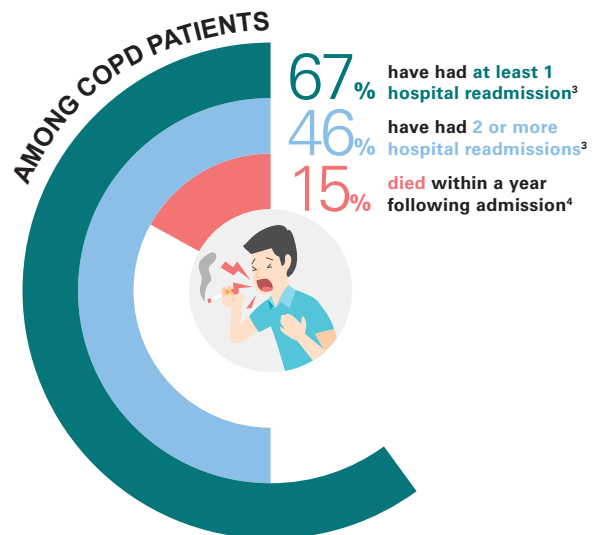
Key messages

- 1 Check smoking status and offer smoking cessation counselling at every opportunity.
- 2 Use LAMA when response to short-acting bronchodilators is inadequate.
- 3 Offer LAMA+LABA in patients with persistent symptoms and exacerbations.
- 4 Use ICS with LAMA+LABA only when there are further exacerbations despite LAMA+LABA therapy.
- 5 Switch patients on ICS without exacerbations in the past year to LAMA or LAMA+LABA.

Appropriate COPD management reduces morbidity and mortality

In Singapore, COPD patients have disproportionately more doctor visits, emergency department admissions, and hospitalisations compared to patients with other conditions.¹ Although not fully reversible, COPD is preventable and clinically manageable even within primary care.

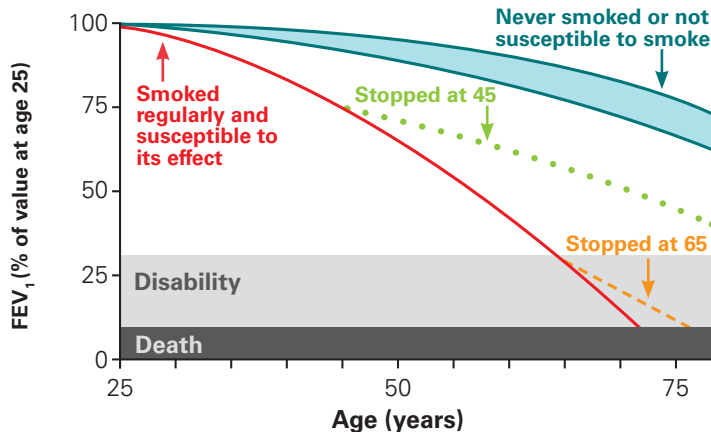
Main treatment goals in managing stable COPD are reducing symptoms and future exacerbations.² Managing it with appropriate inhalers, as well as non-drug measures, are important in reducing COPD-associated morbidity and mortality.



Smoking cessation is the most effective single intervention

Smoking cessation reduces decline in lung function (Figure 1)⁵ and mortality at any stage of COPD. **Check smoking status in every COPD patient and encourage them to reduce or preferably quit smoking.** Studies have shown that even brief clinician advice—less than three minutes—produces long-term smoking abstinence rates of 13.4%.⁶

Figure 1. Smoking and decline of lung function



Adapted from Fletcher C & Peto R, 1977;1:1645-48, with permission from BMJ Publishing Group Ltd

Patient resources on smoking cessation, including cessation programmes, can be found in the Health Promotion Board's Quit Fix booklet at www.healthhub.sg.

Smoking cessation – The ABC

Routinely use the **ABC** approach as opportunistic first-line intervention during consultations.⁷

Ask: Check and document smoking status for every patient.

Brief advice: Urge all smokers to reduce or quit in a clear, strong, and personalised manner.

Cessation support: Offer appropriate cessation support to those willing to quit.

Scan to find out more



Pharmacotherapy—inhaled bronchodilators are central in managing COPD

Pharmacotherapy can reduce symptoms, frequency and severity of exacerbations, and improve quality of life. They have not been shown to modify the long-term rate of decline in lung function.²

Treatment is based on individualised **symptom** and **exacerbation risk** assessment (Figure 2). A **stepwise intensification** of drug therapy is recommended for patients with persistent symptoms or further exacerbations.

Inhalers registered for COPD in Singapore are listed in Figure 3. It includes inhaled bronchodilators and inhaled corticosteroids (ICS). **Inhaled bronchodilators are central in managing COPD.**

Assess inhaler technique and compliance regularly

Incorrect inhaler technique is common. Before stepping up therapy, assess whether patients are compliant with their inhalers and using them correctly.

Provide patients with sufficient information and demonstration on correct inhaler use for optimal benefits. For an inhaler technique checklist, please refer to www.nationalasthma.org.au.

Scan to find out more



Inhaled bronchodilators: SABA, SAMA, LABA, and LAMA

Inhaled bronchodilators relax bronchial smooth muscles, relieving bronchospasm and dyspnoea. They are central in preventing or reducing COPD symptoms.² They comprise beta₂-agonists and antimuscarinics, and can be short- or long-acting.

Short-acting bronchodilators (SABA or SAMA) as relievers

SABA or SAMA can be used as needed to **relieve intermittent dyspnoea** in all COPD patients. Those with only occasional symptoms may be controlled with relievers alone. If symptoms worsen, or the need for short-acting bronchodilators increases, re-evaluate and switch patients to maintenance long-acting bronchodilators.

Long-acting bronchodilators: LAMAs as mainstay

Compared to ICS, long-acting bronchodilators are preferred as the initial maintenance therapy. Using long-acting bronchodilators regularly improves lung function, dyspnoea, health status, and reduces exacerbation rates.² LAMAs are preferred as they have a greater effect on reducing exacerbations compared with LABAs.^{8,9}

If a patient has persistent symptoms or further exacerbations despite treatment with LAMA, offer LAMA+LABA therapy. LAMA+LABA therapy should also be used as initial treatment in patients with significant symptoms and increased exacerbation risk.

Refer to Figure 2's treatment algorithm for COPD patients.

Inhaled corticosteroids (ICS)

ICS have a limited role in COPD management.² However, they are often widely prescribed across all stages of COPD regardless of exacerbation risk. Of patients treated with ICS, it is estimated that only half are true ICS candidates.¹¹

Besides oral thrush, regular use of ICS increases the risk of pneumonia,¹² especially in certain patient subgroups such as:

- Patients with severe disease
- Smokers
- Elderly
- Patients with low body mass index
- Patients with a previous history of exacerbation or pneumonia

Offer ICS combined with LAMA+LABA only in patients with further exacerbations despite LAMA+LABA therapy (Figure 2).

However, ICS may be the first choice for patients with findings suggestive of asthma-COPD overlap (ACO).² Consider specialist referral for this group of patients.

Other drugs in COPD management

Methylxanthines such as theophylline, mucolytics, and macrolides can also be used but should be reserved as adjuncts to inhaled therapy.

Assess symptoms and exacerbation history

To inform **treatment decisions**,

Symptoms can be assessed using:

- COPD Assessment Test (CAT™) with ≥ 10 as the cut-off for significant symptoms; or
- Modified British Medical Research Council (mMRC) with ≥ 2 as the cut-off for significant breathlessness.

An **exacerbation** is a sustained worsening of a patient's symptoms from their usual stable state beyond normal day-to-day variations, and is acute in onset.¹⁰

Two or more exacerbations, or at least one leading to hospitalisation in the previous year, indicates increased exacerbation risk.²

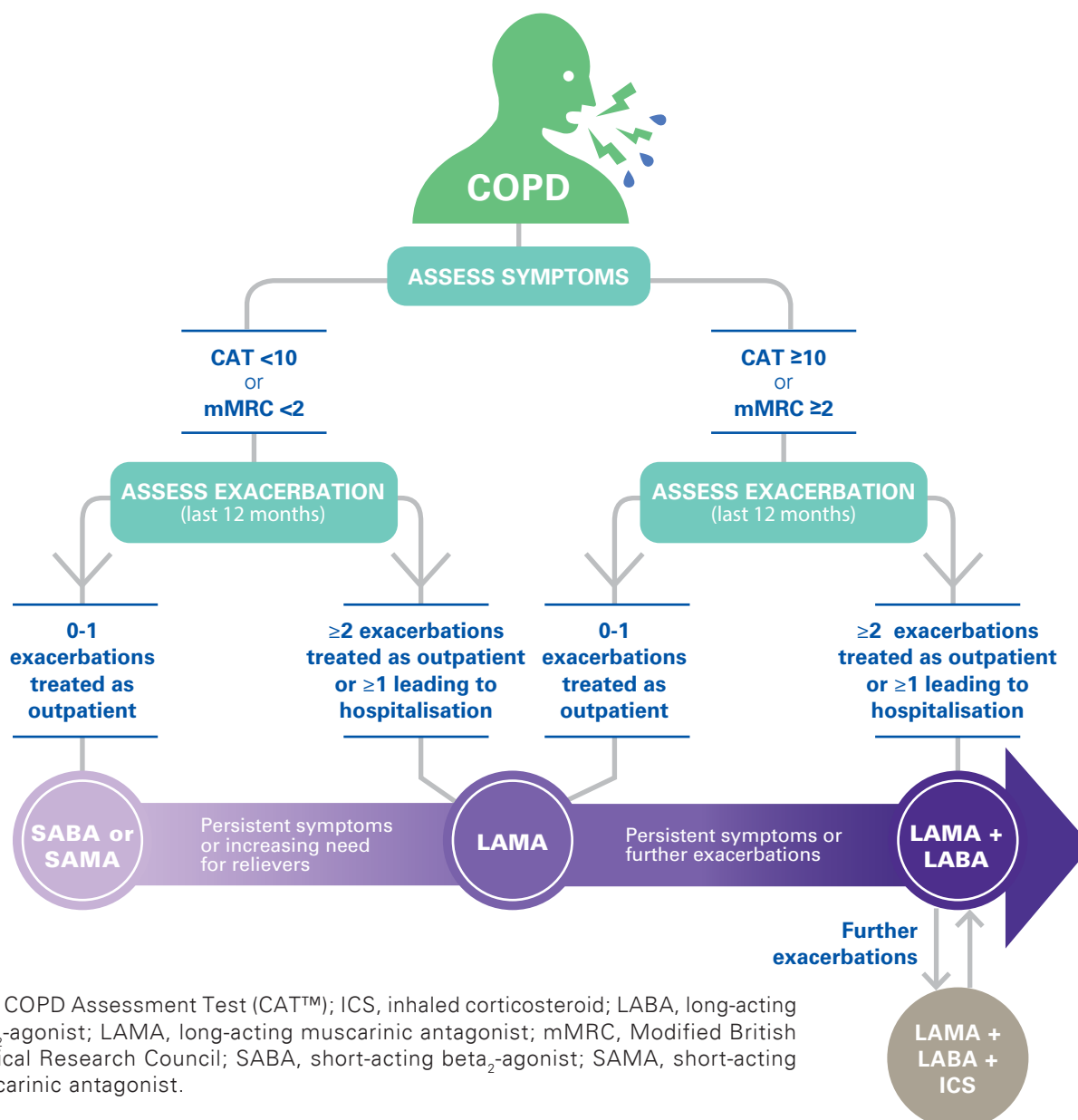
Does your patient really need ICS?

Consider switching patients on ICS (including LABA+ICS) **without exacerbations** in the past year to LAMA or LAMA+LABA therapy.

The decision to switch involves exercising clinical judgement in weighing risks and benefits in individual patient circumstances,^{11, 13} and discussing with the patient. This includes considerations of the extent to which the patient has asthma.

Continue monitoring for exacerbations.

Figure 2. Stepwise intensification of pharmacotherapy for COPD patients



Non-drug measures are equally important

Prescribe influenza and pneumococcal vaccinations

Both influenza and pneumococcal vaccinations decrease lower respiratory tract infections.² Offer yearly influenza vaccination to all COPD patients. To those 65 and older, offer pneumococcal vaccinations PCV13 and PPSV23. Offer PPSV23 to younger COPD patients. **Refer to the National Adult Immunisation Schedule (NAIS) for guidance**, including use of Medisave for the vaccinations.¹⁴

Encourage exercise and pulmonary rehabilitation

Reduced physical activity is common in COPD patients and results in poorer outcomes. **Encourage patients to exercise regularly.** Simple aerobic exercises such as walking three to four times a week for 20 to 30 minutes is beneficial. Coupling this with strengthening exercises such as repeated movements with weights has additional benefits.¹⁵

Pulmonary rehabilitation programmes are available in restructured hospitals. They improve symptoms, quality of life, and exercise tolerance. A key component of the programmes is structured exercise training, recommended twice a week for 6 to 8 weeks. Education and self-management strategies are also incorporated to target behavioural change, with the aim of improving patient well-being and long-term adherence to health-enhancing behaviours.²

Figure 3. Inhalers for COPD

RELIEVERS – SHORT-ACTING BRONCHODILATORS		
Short-acting beta ₂ -agonist (SABA)	Short-acting muscarinic antagonist (SAMA)	SAMA+SABA
<p>Salbutamol, MDI, DPI*</p> 	<p>Ipratropium, MDI, DPI*</p> 	<p>Ipratropium + fenoterol, Berodual N, MDI</p> 
MAINTENANCE – LONG-ACTING BRONCHODILATORS		
Long-acting muscarinic antagonist (LAMA)		
<p>Umeclidinium, Incruse Ellipta</p> 	<p>Glycopyrronium, Seebri Breezhaler</p> 	<p>Tiotropium, Spiriva Respimat</p> 
LAMA+ long-acting beta ₂ -agonist (LABA)		
<p>Umeclidinium + vilanterol, Anoro Ellipta</p> 	<p>Glycopyrronium + indacaterol, Ultibro Breezhaler</p> 	<p>Tiotropium + olodaterol, Spiolto Respimat</p> 
MAINTENANCE – INHALED CORTICOSTEROID (ICS) [†] COMBINATIONS		
LABA+ICS		
<p>Formoterol + budesonide, Symbicort Turbuhaler and Rapihaler</p>  <p>Note: Only the 9/320 mcg and 4.5/160 mcg formulations are registered for COPD.</p>	<p>Salmeterol + fluticasone, Seretide Accuhaler</p>  <p>Note: Only the 50/500 mcg formulation is registered for COPD. Seretide Evohaler (below) is registered for asthma, not COPD.</p> <p>Seretide Evohaler</p> 	<p>Vilanterol + fluticasone, Relvar Ellipta</p>  <p>Note: Only the 25/100 mcg formulation is registered for COPD.</p>

List of inhalers registered and available for COPD in Singapore. Active ingredients in bold denote availability on government subsidy list. List updated as of 25 Sep 2018. Please refer to product inserts for detailed information on the inhalers.

* Available as generics.

[†] ICS (beclomethasone, budesonide, fluticasone) should only be used in combination with LAMA+LABA.

DPI, dry-powder inhaler; MDI, metered-dose inhaler



Check if your patient is doubling up on inhalers

Do not double up on inhalers from the same **class of drugs**.

For example, if a patient is already on one LAMA such as umeclidinium, do not prescribe another, such as glycopyrronium or tiotropium.

Do not double up on inhalers containing an **antimuscarinic** (SAMA, LAMA, or LAMA+LABA).

This includes a SAMA with LAMA, because of potential antimuscarinic/anticholinergic side effects such as dry mouth and urinary retention.

Do not double up on inhalers containing a **LABA** (LAMA+LABA, LABA+ICS).

Common side effects include tremors, palpitations, and headaches.

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This ACG has been adapted with permission from the Global Initiative for Chronic Obstructive Lung Disease (GOLD), Global Strategy for the Diagnosis, Management, and Prevention of COPD (2018) and the Global Initiative for Asthma (GINA), Global Strategy for Asthma Management and Prevention (2018).

About the Agency

The Agency for Care Effectiveness (ACE) is the national health technology assessment agency in Singapore residing within the Ministry of Health (MOH). ACE develops evidence-based "Appropriate Care Guides" or ACGs to guide a specific area of clinical practice. ACGs are aimed at complementing MOH Clinical Practice Guidelines when these are available, by providing additions and updates as reflected in the evidence at the time of development, and incorporating cost-effectiveness considerations where relevant. The ACGs are not exhaustive of the subject matter. When using the ACGs, the responsibility for making decisions appropriate to the circumstances of the individual patient remains with the healthcare professional. This ACG will be reviewed 3 years after publication, or earlier, if new evidence emerges that requires substantive changes to the recommendations.

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