

COPD Prescribing Advice for Inhaler Therapy

<p>NO Asthmatic features / features suggesting steroid responsiveness One or more of the following should apply:</p> <ul style="list-style-type: none"> - No past or concurrent history of asthma - Eosinophil count* of LESS THAN 0.1 x 10⁹/L 		<p>Asthmatic features / features suggesting steroid responsiveness One or more of the following should apply:</p> <ul style="list-style-type: none"> - Past or concurrent history of asthma - Eosinophil count*: <ul style="list-style-type: none"> -Consider between 0.1 and 0.3 x 10⁹/L -More than 0.3 x 10⁹/L 	
<p>Dry Powder Inhaler (DPI) Options HIGH inspiratory Flow ** Technique: Fast and Deep</p>	<p>Metered Dose Inhaler (MDI) / Mist Inhaler Options LOW inspiratory Flow ** Technique: Long and Slow</p>	<p>Dry Powder Inhaler (DPI) Options HIGH inspiratory Flow ** Technique: Fast and Deep</p>	<p>Metered Dose Inhaler (MDI) / Mist Inhaler Options LOW inspiratory Flow ** Technique: Long and Slow</p>
<p>Mild disease and short term symptom relief: OFFER Short Acting Beta-2-Agonist (SABA) FOR USE AS REQUIRED</p>			
<p>Salbutamol 100mcg Easyhaler® 1-2 puffs QDS PRN OR Bricanyl® 500mcg Turbohaler® 1puff QDS PRN</p>  	<p>Salamol® 100mcg MDI 1-2 puffs QDS PRN</p> 	<p>Salbutamol 100mcg Easyhaler® 1-2 puffs QDS PRN OR Bricanyl® 500mcg Turbohaler® 1puff QDS PRN</p>  	<p>Salamol® 100mcg MDI 1-2 puffs QDS PRN</p> 
<p>If the patient is limited by symptoms or has exacerbations</p>			
<p style="text-align: center;">Consider LABA + LAMA</p>		<p style="text-align: center;">Consider LABA + ICS</p>	
<p>Anoro® 55/22mcg Ellipta® 1 puff OD OR Duaklir 340 / 12 mcg Genuair® 1 puff BD</p>  	<p>Spolto 2.5/2.5mcg Respimat® 2 puffs OD OR Bevespi® 7.2/5mcg Aerosphere® 2 puffs BD</p>  	<p>Fostair® 100/6 mcg NEXThaler 2 puffs BD OR Symbicort® 200/6mcg Turbohaler 2 puffs BD OR Relvar 92/22mcg Ellipta® 1puff OD</p>   	<p>Fostair® 100/6 mcg MDI 2 puffs BD</p> 
<p>For patients who have day – to -day symptoms that adversely impact quality of life, or have 1 severe or 2 moderate exacerbations within a year</p>			
<p style="text-align: center;">Consider 3-month trial of LABA + LAMA + ICS (Triple Therapy). If no improvement, revert back to LABA + LAMA</p>		<p style="text-align: center;">Offer LABA + LAMA + ICS (Triple Therapy).</p>	
<p>Trelegy 92/55/22mcg Ellipta® 1 puff OD</p> 	<p>Trimbow® 87/5/9mcg MDI 2 puffs BD OR Trixeo 160/7.2mcg/5mcg Aerosphere® 2 puffs BD <small>(preferred choice if patient has previously tolerated Bevespi Aerosphere® MDI as contains same LAMA/LABA with the addition of Budesonide as the ICS)</small></p>  	<p>Trelegy 92/55/22mcg Ellipta 1 puff OD</p> 	<p>Trimbow® 87/5/9mcg MDI 2 puffs BD <small>(preferred choice if patient has previously tolerated Fostair MDI as contains same ICS/LABA with the addition of glycopyrronium as the LAMA)</small> OR Trixeo 160/7.2mcg/5mcg Aerosphere® 2 puffs BD</p>  
<p>* Please refer to 'The significance of eosinophil counts' supporting guidance section below for more information; ** Use an In-Check device to determine patients inspiratory flow rate – Instructions on use at In Check DIAL G16 - YouTube</p>			
<p>It may be appropriate for patients currently stable to remain on existing inhalers as per previous guidance: Information regarding inhalers not included in this guidance but still available on the OCCG/OUH formulary are available at http://www.oxfordshireformulary.nhs.uk</p>			

Maintenance Management of COPD – Inhaled and Oral Therapies (Adults)

Managing Stable COPD: The fundamentals of COPD care, according to NICE Chronic obstructive pulmonary disease in over 16s: diagnosis and management (NG115), 2018 are to:

- offer treatment and support to stop smoking
- offer pulmonary rehabilitation if indicated
- offer pneumococcal and influenza vaccinations
- optimise treatment for co-morbidities
- co-develop a personalised self management plan

These treatments and plans should be revisited at every review.

Inhaled therapies should be started only if:

- all the above interventions have been offered (if appropriate), and
- inhaled therapies are needed to relieve breathlessness and exercise limitation, and
- people have been trained to use inhalers and can demonstrate satisfactory technique.

Use of Spacers: Every patient using an MDI should have a spacer to administer their maintenance medication. Patients should be made aware that:

- The drug should be administered by a single actuation of the metered dose inhaler into the spacer, followed by inhalation – Subsequent doses may be repeated at 30 second intervals.
- There should be minimal delay between MDI actuation and inhalation.
- Tidal breathing is as effective as single breaths.
- Spacers should be cleaned monthly rather than weekly as per manufacturer's recommendations or performance is adversely affected. They should be washed in detergent and allowed to dry in air. The mouthpiece should be wiped clean of detergent before use.
- Drug delivery via a spacer may vary significantly due to static.
- Plastic spacers should be replaced at least every 12 months but some may need changing at 6 months.

The Significance of Eosinophil Counts: The peripheral blood eosinophil, measured routinely from a full blood count, has been shown to be a sensitive and specific biomarker in COPD. It is used in clinical practice, to determine the potential for inhaled corticosteroid response. Evidence from Oxford and now replicated in numerous studies worldwide show a linear association of the peripheral blood eosinophils with exacerbation frequency in patients with COPD. This exacerbation risk in patients with eosinophil levels above $0.1 \times 10^9/L$ and to a much greater extent levels above $0.3 \times 10^9/L$ can be attenuated with inhaled corticosteroids in patients with COPD.

GOLD (Global Initiative for Chronic Obstructive Lung Disease) strongly recommend the initiation of inhaled corticosteroids in patients with COPD who continue to have exacerbations despite being on bronchodilator therapy if eosinophil levels are above $0.3 \times 10^9/L$ cells/uL; to consider inhaled corticosteroids in these patients with eosinophil counts between $0.1 - 0.3 \times 10^9/L$; and also strongly recommends avoidance of inhaled corticosteroids in patients with COPD in whom the eosinophils are less than $0.1 \times 10^9/L$.

There is some variability of eosinophil counts, and significant reduction if the full blood count (FBC) is taken during a course of oral corticosteroids. Advice would suggest if available, to review the trends of eosinophil counts over time to assess likelihood of eosinophil count levels. Otherwise there is low/moderate evidence advising the frequency of measuring the FBC. In 2 weeks, and at 3months, the repeatability of eosinophil counts is high and suggest only one reading is needed.

Importance of Inhaler Technique: Teaching inhaler technique improves the correct usage of inhalers. Inhalers should only be prescribed after patients have received training in the use of the device and have demonstrated satisfactory technique.

Choice of inhaler device should be firstly based on patient's inspiratory capacity, along with choice of drug, patient preference and local cost. Other considerations include:

- Using the In-Check device to help determine the best inhaler device for a patient using their inspiratory flow as a guide. Note that a small proportion of patients may have insufficient inspiratory capacity to effectively use an MDI.
- Patient preference for certain devices should be considered. If the patient is unable to use a device satisfactorily an alternative should be found.
- The patient should have their ability to use the prescribed inhaler device (particularly for any change in device) assessed by a competent healthcare professional.
- Inhaler technique must be reassessed as part of a structured clinical review.
- Generic prescribing of inhalers should be avoided as this might lead to people with COPD being given an unfamiliar inhaler device which they are not able to use properly.
- Prescribing mixed inhaler types may cause confusion and lead to increased errors in use.
- Helpful training videos are available online at www.asthma.org.uk/advice/inhaler-videos/ and www.rightbreathe.com

Maintenance Management of COPD – Inhaled and Oral Therapies (Adults)

Add-on Therapies:

In addition to inhaler therapy, there are a few oral medications that can be considered in the treatment of COPD:

Therapy	Dosage	Notes
Mucolytics: Carbocisteine 375mg Capsule	Initially 750mg TDS	Consider mucolytic drug therapy for people with a chronic cough productive of sputum. Only continue mucolytic therapy if there is symptomatic improvement, for example, reduction in frequency of cough and sputum production. Do not routinely use mucolytic drugs to prevent exacerbations in people with stable COPD.
Xanthine: Theophylline 200mg MR Tablet <i>Brand: Uniphyllin Continus</i>	Initially 200mg BD	Theophylline should only be used after a trial of both short-acting bronchodilators and long-acting bronchodilators, or for people who are unable to use inhaled therapy. TDM: A 6-hour post dose level should be taken after: <ul style="list-style-type: none"> - the first 5 days of treatment - 5 days after a change in dose - 5 days after an additional medication added into a patients' medication regimen that can change the levels of serum theophylline Be aware of common side effects.
Phosphodiesterase-4 inhibitors: Roflumilast	Initially 250mcg OD for once month then increased to 500mcg OD thereafter	<u>To be initiated by OUH Respiratory Consultants only</u> Roflumilast, as an add-on to bronchodilator therapy, is recommended as an option for treating severe chronic obstructive pulmonary disease in adults with chronic bronchitis, only if: <ul style="list-style-type: none"> - the disease is severe, defined as a forced expiratory volume in 1 second (FEV1) after a bronchodilator of less than 50% of predicted normal, and - the person has had 2 or more exacerbations in the previous 12 months despite triple inhaled therapy with a long-acting muscarinic antagonist, a long-acting beta-2 agonist and an inhaled corticosteroid. Further information is available via NICE TA 461 and local Shared Care Protocol available at http://oxccgportal.multi2.sitekit.net/clinical-support/local-pathways-and-guidelines/Prescribing/Roflumilast%20Amber%20Continuation%20Guideline.pdf
Macrolides: Azithromycin 250mg Tablet	250mg 3 x week	<u>Only to be used after advice has been sought from an OUH Respiratory Clinician:</u> Consider azithromycin (usually 250 mg 3 times a week) for people with COPD if they: <ul style="list-style-type: none"> • do not smoke and • have optimised non-pharmacological management and inhaled therapies, relevant vaccinations and (if appropriate) have been referred for pulmonary rehabilitation and • continue to have 1 or more of the following, particularly if they have significant daily sputum production: <ul style="list-style-type: none"> - frequent (typically 4 or more per year) exacerbations with sputum production - prolonged exacerbations with sputum production - exacerbations resulting in hospitalisation.

If a trial of an add-on treatment is ineffective, stop the drug

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Inhalers and Their Carbon Footprint:

There is growing awareness and concerns from patients and clinicians, regarding the carbon footprint of MDIs. The latest BTS guidelines 2019 state:

Metered dose inhalers contain propellants which are liquefied, compressed gases used as a driving force and an energy source for atomisation of the drug. Chlorofluorocarbons (CFCs), which were used originally, are potent greenhouse gases and ozone-depleting substances, and were phased out under the Montreal Protocol. They have been replaced by two hydrofluoroalkane (HFA) propellants identified as having a high global-warming potential. As a result of this change, MDIs currently contribute an estimated 3.5% of the carbon footprint of the NHS in the UK. The UK has a high proportion of MDI use (70%) compared with the rest of Europe (< 50%).

Prescribers, pharmacists and patients should be aware that there are significant differences in the global-warming potential of different MDIs and that inhalers with low global-warming potential

What to do	How to do it	Impact
Improve asthma control	Review treatment and encourage regular preventer treatment by every means possible	Fewer symptoms and reduced use of salbutamol metered dose inhalers (MDIs) which contain potent greenhouse gases
Improve COPD control and reduce use of SABA reliever inhalers	Prioritise smoking cessation, exercise promotion and pulmonary rehabilitation, flu immunisation. Finally add in regular long acting bronchodilators.	These preventive interventions are proven to be more cost-effective treatments than inhalers. Regular long acting bronchodilators should be the mainstay of drug treatment in COPD.
Promote effective self-management	Written personal action plans	Better disease control and quicker response to exacerbations
Ensure all inhalers are used with correct technique for greater effectiveness	Know how to assess this and teach it. Encourage use of online video tutorials	Reduced waste, more effective use of inhalers
Consider changing MDI treatments to DPIs for regular therapy.	Ensure this is clinically appropriate and acceptable to the patient. Matching the inhaler to the patient's abilities and preferences can improve technique and compliance.	Typical MDIs have a carbon footprint of ~20kgCO ₂ e each. DPIs and Respimat devices are less than 1kgCO ₂ e each
Make optimal use of spacers to increase clinical effectiveness of MDIs where these are used	Encourage all patients using MDIs to use spacers when at home	Increases lung deposition and reduces oral deposition of drug
Prescribe MDIs so as to minimise propellant quantity	Salamol inhaler contains half as much propellant as Ventolin inhaler for equivalent dosage.	Halves the carbon footprint. One Ventolin® inhaler has a carbon footprint of 28kgCO ₂ e per inhaler. (equivalent to a journey of 180 miles in an average car)
Ensure MDIs are not discarded before they are empty	Ensure patients know how many doses their MDI contains when new, especially if the inhaler lacks a dose counter	Recycling studies show that many MDIs are discarded when still half full.
Promote responsible disposal of inhalers	Encourage patients to return used inhalers to local pharmacies.	Inhalers returned in medical waste are incinerated. Thermal degradation converts the HFAs into products with far lower greenhouse effect. Recycling captures the HFAs for re-use in refrigeration or air conditioning, and reduces plastic and aluminium waste.