Quality Prescribing for Respiratory 2024 – 2027

Consultation on Draft Guidance

September 2023

Scottish Government
Riaghaltas na h-Alba

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Glossary of Terms
The following terms are used in this consultation:

ACQ (6)	Asthma control Questionnaire
ACP	Activated Clotting Time
ACT	Asthma Control Test
AF	Atrial fibrillation
AHP	Allied Healthcare Professional
ANA	Anti-Nuclear Antibodies
ANCA	Anti-Neutrophil Cytoplasm Antibodies
ANP	Advanced Nurse Practitioner
ARDs	Acute Respiratory Distress Syndrome
BMI	Body Mass Index
BNF	British National Formulary
BTS	British Thoracic Society
CAT	Computerized Axial Tomography
CF	Cystic Fibrosis
CO2	Carbon dioxide
COPD	Chronic Obstructive Pulmonary Disease
CRP	C-reactive protein
CSH	Centre for Sustainable Health
CXR	Chest X-ray
DEXA	Dual Energy X-ray Absorptiometry
DPI	Dry powder inhaler
DTaP	Diptheria-tetanus-pertussis vaccine
ECG	Electrocardiogram
ERS	European Respiratory Society
EU	European Union
FBC	Full blood count
FeNO	Fractionated Exhaled Nitric oxide
FEV_1	Forced Expiratory Volume in 1 Second
FVC	Forced Vital Capacity
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GP	General Practitioner
GWI	Global Water Intelligence
GWP	Global warming potential
HFA	Hydrofluoroalkane
HIS	Healthcare Improvement Scotland
HSCP	Health and Social Care Partnership
ICS	Inhaled Corticosteroids
ILD	Interstitial Lung Disease
IPF	Idiopathic pulmonary fibrosis
IT	Information Technology
ITU	Intensive Therapy Unit
LABA	Long-Acting Beta Agonist

LAMA	Long-Acting Muscarinic Antagonist
LRA	Leukotriene receptor antagonists
MAB	Monoclonal antibody
MART	Maintenance and Reliever Therapy
MCN	Managed Clinical Network
MCR	Medicines care and Review
MDI/ pMDI	Metered Dose inhaler (pressurised)
MRC	Medical Research Council – Breathlessness scale
NCDs	Non-communicable Diseases
NHS	National Health Service
NICE	National Institute for Health and Social Care Excellence
NRAD	National Review of Asthma Deaths
NTM	Nontuberculous Mycobacterial
OCS	Oral Corticosteroids
PFTs	Pulmonary Function Tests
PIS	Prescribing Information System
PRISMS	Prescribing Information System for Scotland
QI	Quality Improvement
RAST	RadioAllergosorbent Test
RCGP	Royal College of General Practitioners
SABA	Short Acting Beta Agonists
SAMA	Short-Acting Muscarinic Antagonist
SAPG	Scottish Antimicrobial Prescribing group
Sats	Saturations (Oxygen)
SIGN BTS	Scottish Intercollegiate Guidelines Network / British Thoracic Society
SMC	Scottish Medicines Consortium
SPC	Summary of product characteristics
STU	Scottish Therapeutics Utility
TFT	Thyroid Function Test
tCO2e	Tonnes of carbon dioxide equivalent
Us and Es	Urea and Electrolytes
VBA	Very Brief Advice
WHO	World Health Organisation

Introduction

Respiratory diseases are amongst our largest health concerns. We've all had illnesses or seasonal allergies that can affect our breathing. However, the scope of respiratory disease and the impact on sufferers are often misunderstood. Respiratory diseases are a major driver of health inequalities with a high prevalence in Scotland's most deprived areas.

Many respiratory disorders are chronic and long-lasting and have a significant impact on sufferers' health and quality of life – simple activities become a challenge and fear of further complications often leave sufferers afraid of leaving their house.

In many cases, chronic respiratory disorders take years to develop. This combined with an increased risk of acute respiratory conditions as we age means that the long term effects of respiratory disorders in the ageing population is of concern.

Together with experts from across NHS Scotland and Experts by Experience, Scottish Government has produced an updated "Quality Prescribing for Respiratory – A Guide for Improvement".

The guidance is designed to ensure that people with respiratory conditions are at the centre of their treatment. They, their families and their carers should be actively involved and engaged with their treatment and care decisions at all stages of their conditions.

This Quality Prescribing Guide is intended to support clinicians and shared decision making for people with respiratory conditions (asthma, COPD, bronchiectasis and IPF) in the appropriate use of medicines, whilst applying the principles of value-based healthcare and realistic medicine.

In addition to the clinician focused Quality Prescribing Guide, in conjunction with the Health & Social Care Alliance Scotland, we have also produced a draft "Patient Information Guide".

This consultation provides an opportunity for all interested parties to comment on both the "Quality Prescribing for Respiratory – A Guide for Improvement" and the "Patient Information Guide".

We will be holding a virtual consultation event during the consultation period and you can register your interest in attending by emailing EPandT@gov.scot.

Responding to this Consultation

We are inviting responses to this consultation by 31 October 2023.

Please respond to this consultation using the Scottish Government's consultation hub, Citizen Space. Access and respond to this consultation online. You can save and return your responses while the consultation is still open. Please ensure that consultation responses are submitted before the closing date of 31 October 2023.

If you are unable to respond using our consultation hub, please complete the Respondent Information Form and email to EPandT@gov.scot.

Handling your response

If you respond using the consultation hub, you will be directed to the About You page before submitting your response. Please indicate how you wish your response to be handled and, in particular, whether you are content for your response to be published. If you ask for your response not to be published, we will regard it as confidential, and we will treat it accordingly.

All respondents should be aware that the Scottish Government is subject to the provisions of the Freedom of Information (Scotland) Act 2002 and would therefore have to consider any request made to it under the Act for information relating to responses made to this consultation exercise.

If you are unable to respond via Citizen Space, please complete and return the Respondent Information Form included in this document.

To find out how we handle your personal data, please view our privacy policy.

Next steps in the process

Where respondents have given permission for their response to be made public, and after we have checked that they contain no potentially defamatory material, responses will be made available to the public on the consultation hub. If you use the consultation hub to respond, you will receive a copy of your response via email.

Following the closing date, all responses will be analysed and considered along with any other available evidence to help us. Responses will be published where we have been given permission to do so. An analysis report will also be made available.

Comments and complaints
If you have any comments about how this consultation exercise has been conducted, please send them to EPandT@gov.scot.

Scottish Government consultation processes
Consultation is an essential part of the policy making process. It gives us the opportunity to consider your opinion and expertise on a proposed area of work.

You can find all our consultations online. Each consultation details the issues under consideration, as well as a way for you to give us your views, either online or by email.

Responses will be analysed and used as part of a decision-making process, along with a range of other available information and evidence. We will publish a report of this analysis for every consultation. Depending on the nature of the consultation exercise the responses received may:

- indicate the need for policy development or review
- inform the development of a particular policy
- help decisions to be made between alternative policy proposals
- be used to finalise legislation before it is implemented

While details of particular circumstances described in a response to a consultation exercise may usefully inform the policy process, consultation exercises cannot address individual concerns and comments, which should be directed to the relevant public body.

Environmental Considerations

To play our part in tackling the climate crisis, NHS Scotland is aiming to become a net-zero health service by 2040 at the latest. We are part of an international coalition of over 60 countries to date who have committed to developing a low-carbon health system.

The propellant used in metered dose inhalers (MDIs) prescribed for asthma and chronic obstructive pulmonary disease (COPD) are powerful greenhouse gases with global warming potentials of 1,430 or 3,220 times greater than CO2 depending on the type. Around 4.5 million MDIs were dispensed in Scotland in 2020/21, we estimate that this accounts for 79,000 tonnes of CO2 a year. This compares with 430,000 tonnes of CO2 from building energy use each year and is more than the emissions from the NHS fleet and waste combined. Reducing emissions from MDIs is essential to achieving our net-zero goals.

Research has so far shown that switching to a greener, environmentally-friendly dry powder inhaler (DPI) works well for most people. It is therefore in the interests of both patients and the environment that we make improvements to the way that asthma and COPD are managed. The NHS can improve outcomes for patients and reduce the number of short-acting reliever inhalers that are used. DPIs, which do not use propellant, are also suitable for many patients and have a far lower carbon impact than MDIs. We can reduce emissions through changes in prescribing practices e.g. implementing regular medication reviews of patients to optimise care, and that for those people on MDIs and considering the switch to DPI as part of their review, supporting them to switch to DPIs where those are suitable for them.

As long as an individual's healthcare professional shows them how to use their new inhaler, and it can be used well, changing from a MDI to DPI is not linked to symptoms getting worse or asthma attacks.

Most adults find DPIs easier to use than MDIs because it is easier to get the technique right. DPIs are breath-actuated though, which means a user would need to be able to inhale the powder. Some people may find it hard to do this, therefore, if a DPI is not right a change will not be recommended. If an individual does switch and they do decide to try a DPI and find that it doesn't suit well, they can ask to change back.

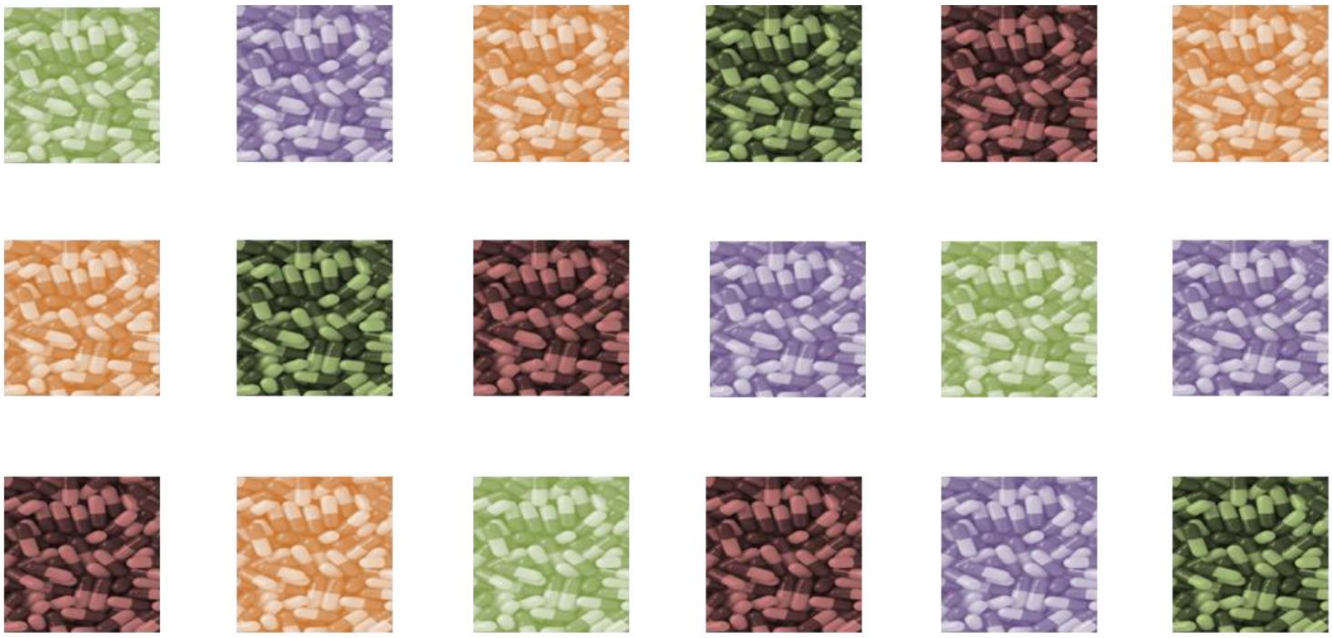
The existing SIGN Guidance on the Management of Asthma supports this approach. It states:

"Prescribers, pharmacists and patients should be aware that there are significant differences to the global-warming potential of different MDIs and that inhalers with low global warming potential should be used where they are likely to be equally effective. Where there is no alternative to MDIs, lower volume HFA134a inhalers should be used in preference to large volume or HFA227ea inhalers."[1]

[1] SIGN158 British guideline on the management of asthma, revised edition, July 2019 (Page 88)

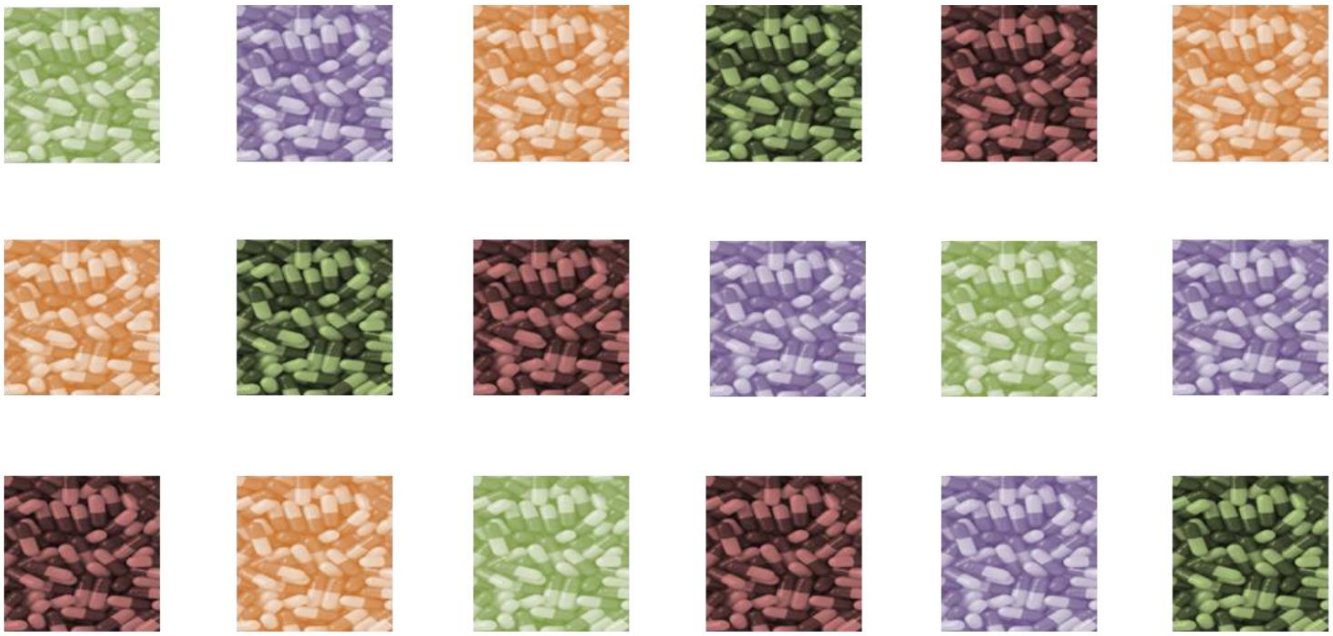
Clinical Guide for use by Prescribers

(Cover image courtesy of Piyachok Thawornmat at FreeDigitalPhotos.net)



Quality Prescribing for Respiratory

A Guide for Improvement 2024-2027



Clinical Foreword

Promotion of appropriate prescribing of medicines to treat asthma, Chronic Obstructive Pulmonary Disease (COPD), bronchiectasis and idiopathic pulmonary fibrosis (IPF) is essential to optimise treatment outcomes and achieve the best care for the individual.

We feel that we will achieve better disease control and patient outcomes by:

- placing an emphasis on the person-centred review of medicines
- optimising patient care for respiratory conditions in adults
- using effective pharmaceutical and non-pharmaceutical treatment options

This guide promotes a person-centred approach to care and the 7-Steps approach to medicines reviews in the management of respiratory illness, embedding shared decision-making throughout the process.

This document also takes into account environmental considerations. We feel that better control of respiratory conditions can be achieved through:

- promotion of good person-centred care
- improved preventative treatment plans
- promotion of correct use of Metered Dose Inhalers where necessary
- use of environmentally sustainable inhalers where appropriate - including considering a switch from Metered Dose Inhalers to Dry Powder Inhalers where clinically appropriate

Improved disease control will lessen environmental impacts and this will ultimately aid NHS Scotland in achieving net-zero carbon emissions.

This guide highlights clinical recommendations for respiratory prescribing practices and utilising data for improvement and benchmarking across NHS boards in Scotland. This will help optimise therapy and drive improvement according to current national guidance.

This guide builds upon the previous 2018-21 strategy and has been written by Scottish Government and NHS Scotland, supported by patients with lived experience, patient organisations and the multidisciplinary team across primary and secondary care. It is aimed at Primary and Secondary Care clinicians, Managed Clinical Networks and Board Medicines Management Teams.

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1. Executive Summary

Respiratory conditions are a major contributor to ill health, disability, and premature death – the most common conditions being asthma and COPD. [1] Scottish Health Survey reported the average incidence of asthma as 16% and COPD as 4%.[2]
The World Health Organisation has identified chronic respiratory disease as a non-communicable disease (NCD) along with diabetes, cancers and cardiovascular disease. NCDs are responsible for 71% of global death annually. [3]

This guidance is designed to ensure people with respiratory conditions are at the centre of their treatment. They, their families and their carers should be actively involved and engaged with their treatment and care decisions at all stages of their condition.

This quality prescribing guide is intended to support clinicians and shared decision-making for people with respiratory conditions (asthma, COPD, bronchiectasis and IPF) in the appropriate use of medicines, whilst applying the principles of value-based healthcare and realistic medicine.

The guide will consider the effective use of treatment in respiratory conditions, as well as the delivery devices and their environmental impact. The vast majority of medicines for respiratory conditions are delivered via the inhaled route, either by pressurised metered dose inhaler (pMDI), dry powder inhaler (DPI) or soft mist inhaler (SMI).

In asthma, early control is the aim of treatment, using inhaled corticosteroids (ICS) as the most effective preventer drug. Add-on therapy should only be initiated after checks on inhaler technique, adherence and elimination of trigger factors.

People with asthma who order more than three short acting bronchodilator (SABA) inhalers a year should be prioritised for a review, as this is a marker of poor asthma control and increased healthcare utilisation. Reduction in over-reliance on SABA inhalers, through improved disease control, will support the reduction in CO2 emissions from pressurised metered dose inhalers (pMDIs). SABA pMDI's currently account for the majority of pMDIs prescribed in Scotland and are a source of two-thirds of the CO2 emissions. Individuals who are prescribed SABA monotherapy should be reviewed to confirm their respiratory diagnosis and ensure that appropriate preventative treatment is prescribed, for example, ICS for asthma. People with asthma should be maintained on the lowest possible dose of ICS inhalers to effectively treat their symptoms and reduce the potential for side effects or harm from treatment.

People with severe asthma should be identified using criteria such as number of SABA reliever inhalers per year, number of exacerbations or poor symptom control and be referred to secondary care for treatment optimisation.

In people with COPD, inhaled ICS are prescribed who have a severe exacerbation or more than two exacerbations in one year or if there are asthmatic features. ICS therapy should be reviewed to reduce the risk of pneumonia and adrenal suppression. Triple therapy inhalers instead of multiple individual inhalers should be considered to improve adherence and cost effectiveness and reduce the carbon footprint from inhaler use.

Antibiotics should only be used for infective exacerbations in COPD (five-day course) and up to 14 days in bronchiectasis. Following advice from secondary care, some patients who have frequent exacerbations may require regular antibiotic treatment with azithromycin. Oral corticosteroids should be avoided in patients with bronchiectasis unless there is a clear indication. Long term oral corticosteroids are not recommended for people with COPD, but short courses may be used to treat exacerbations.

Idiopathic pulmonary fibrosis (IPF) is treated with anti-fibrotics, which should be prescribed and monitored by a clinician with experience of treating IPF.

The environmental impact of inhalers is a key consideration to contribute to the achievement of net-zero greenhouse gas emissions by NHS Scotland by 2040. Prescribers are asked to consider inhalers with a lower global warming potential (GWP) where appropriate and local formularies should highlight and promote inhalers with a lower GWP.

To support this work, a suite of safety and medication effectiveness indicators have been developed, with a multi-professional and patient group. These indicators provide data to enable benchmarking and help drive quality improvement by reducing unwarranted variation in prescribing practice.

2. Summary of Prescribing Recommendations

For all people with respiratory conditions:

- recommend that patients receive medication reviews using the Polypharmacy 7-Steps approach

Asthma

- recommend that a patient prescribed six or more inhalers annually is a trigger for timely, priority review - an immediate prescription may be necessary but review should take place before authorisation of the next prescription
- review patients on SABA inhalers alone, clarifying the diagnosis and establishing reasons for SABA only use
- review patients with asthma prescribed SABA and LABA without ICS
- review patients with asthma who have been prescribed an ICS inhaler and do not currently order on their repeat prescription - assess adherence and understanding of treatment to establish appropriate use of SABA inhalers
- review inappropriate use of high strength corticosteroid inhalers (maintaining patients at the lowest possible dose of inhaled corticosteroid)
- reductions in high dose ICS should be considered every three months, decreasing the dose by approximately 25–50% each time, arranging regular review as treatment is reduced
- issue a steroid treatment card to patients on inhaled high dose corticosteroids – a steroid emergency card may also be required
- review montelukast at four to eight weeks following initiation to ensure a response and that therapy is still required

In severe asthma

- identify patients with severe asthma and where modifiable risk factors are addressed and asthma care remains suboptimal, refer to secondary care for treatment optimisation

In children with asthma

Whilst this guidance is not for children and prescribers should refer to guidance on asthma management in children, there are two medication safety points to highlight:

- record regular growth monitoring when treating children with ICS
- ensure children on medium / high-dose ICS are under the care of a specialist paediatrician

COPD

- inhaled ICS are prescribed for people with COPD who have a severe exacerbation or more than two exacerbations in one year or if there are asthmatic features. Review patients with COPD following initiation of inhaled ICS after three months and stop if there is insufficient response or if there are adverse effects
- mucolytic therapy is considered for symptoms of chronic cough with productive sputum and should be reviewed four weeks after commencing therapy, stopping if symptoms have not improved with use
- regular review of mucolytic therapy during the annual COPD review should be undertaken and may be stopped if there is no productive cough
- review patients with COPD on separate LAMA and LABA/ ICS inhalers and, if appropriate change to triple therapy inhalers
- review antibiotic course length (five-day course recommended) if needed for infective exacerbations of COPD, with sputum cultures for treatment failure

Bronchiectasis

- antibiotic choice should be directed by previous positive cultures - in the absence of previous positive sputum cultures, broad spectrum oral antibiotics to cover common respiratory pathogens are recommended, using local formulary guidance where available
- azithromycin 250mg three times a week is recommended for patients with four or more exacerbations in any 12-month period, usually started after advice from secondary care
- recommend six-month review of the effectiveness of mucolytic therapy

Idiopathic pulmonary fibrosis

- anti-fibrotics prescribed only by a clinician with experience of treating IPF
- only prescribe anti-fibrotics when there is confirmed fibrotic lung disease with evidence of physiological progression

Environmental considerations

- promote patient reviews to optimise disease control and reduce inappropriate prescribing of inhalers
- prioritise review of patients with asthma who are over-reliant on SABA inhalers, defined as ordering more than three inhalers per year (see asthma chapter)
- streamline devices for patients, avoiding mixed device use where possible
- review separate inhalers where a combination inhaler device would be possible
- review patients prescribed SABA alone, check diagnosis and if appropriate consider a DPI
- update local formularies to highlight and promote inhalers which have lower CO2 emissions
- use ScriptSwitch to promote environmental messages e.g.
    - highlighting SABA overuse
    - prescribe small cannister Salbutamol pMDI with lower global warming potential (GWP) (Salamol® or Airomir®)
- raise local public awareness to promote improvements in asthma care and the environmental impact of respiratory prescribing
- utilise resources to support environmentally friendly prescribing (see appendix 1)
- **for new patients:**
    - use inhalers with low global warming potential when they are as equally effective
    - where there is no alternative to a pMDIs, lower volume HFA 134a pMDIs should be used in preference to large volume or HFA 227ea pMDIs
- **for existing patients:**
    - switch to DPI if appropriate, following a patient review - we do not recommend a blanket switch
    - consider switch to DPI inhalers for patients with asthma who:
        - have an adequate inspiratory flow (e.g. use an In-Check® device)
        - have been stable for two years
        - have had no asthma attack for two years
        - have never been admitted to hospital /ITU
        - not under secondary care review

3. Introduction

What is the purpose of this guidance?

Respiratory conditions are a major contributor to ill health, disability, and premature death – the most common conditions being asthma and COPD. [1] Scottish Health Survey reported the average incidence of asthma as 16% and COPD as 4%.[2] The World Health Organisation has identified chronic respiratory disease as a non-communicable disease (NCD) along with diabetes, cancers and cardiovascular disease. NCDs are responsible for 71% of global death annually. [3]

The impact of respiratory conditions can vary depending on many factors. There is often a high prevalence of co-morbidities such as heart disease, hypertension and diabetes in individuals with respiratory conditions, which will also have to be addressed during a prescribing review. Optimising pharmacological treatment of these conditions is vital to help control symptoms and increase the quality of life for the individual.

The guidance promotes Realistic Medicine using the holistic 7-Steps polypharmacy approach to medicine reviews that includes shared decision-making, a personalised approach to care, reducing harm and waste and addressing unwarranted variation and ineffective prescribing practice. [4, 5]

This guide will build on what already works well in respiratory prescribing and encourage further quality improvement within NHS Scotland. It highlights key respiratory prescribing indicators, and it is hoped that clinicians will reflect on their current practice in prioritised areas. The guidance should be read in conjunction with clinical guidance such as SIGN or NICE - it is not intended to replace them. The guidance has four main sections on asthma, COPD, bronchiectasis and Interstitial Lung Disease (ILD), focusing on Idiopathic Pulmonary Fibrosis (IPF).

Environmental considerations for respiratory prescribing will be introduced and explored. NHS Scotland has committed to be a net-zero greenhouse gas emissions organisation by 2040[6] with more individuals interested in their own carbon footprint.

We sometimes refer to ‘patients’ throughout the document, and recognise that different terminology is often used in official documentation. We recognise that patients are people who are managing different medical conditions, including respiratory disease.

Who is the guidance for?
It is for all health care professionals involved in respiratory care and prescribing decisions in both primary and secondary care including doctors, nurses, pharmacists, pharmacy technicians, physiotherapists and occupational therapists.

The guidance will be available on the Polypharmacy: Manage Medicines app [7] for ease of access and as an additional support for patients and clinicians. If clinicians can reflect on their own prescribing practice, it will help reduce unwanted variation of prescribing across Scotland.[8]

Why is the guidance important?
Figure 1 below highlights the spend of respiratory prescribing in Primary Care in 2021/22 by inhaler type. The total annual spend in 2021/22 was approx. £112.9 million. This represents 10.1 % of the Scottish Primary Care prescribing spend and is £11.9 million less than the total prescribed in 2015/16. Prescribing costs of Short Acting Beta Agonist inhalers (SABA) has reduced by 15% in the same time period. At the same time, there has been an increase in use of long-acting combination bronchodilator inhalers (LABA/LAMA) and triple combination inhalers (ICS/LABA/LAMA) as they are now more widely available and are more cost effective compared to single ingredient inhaler use.

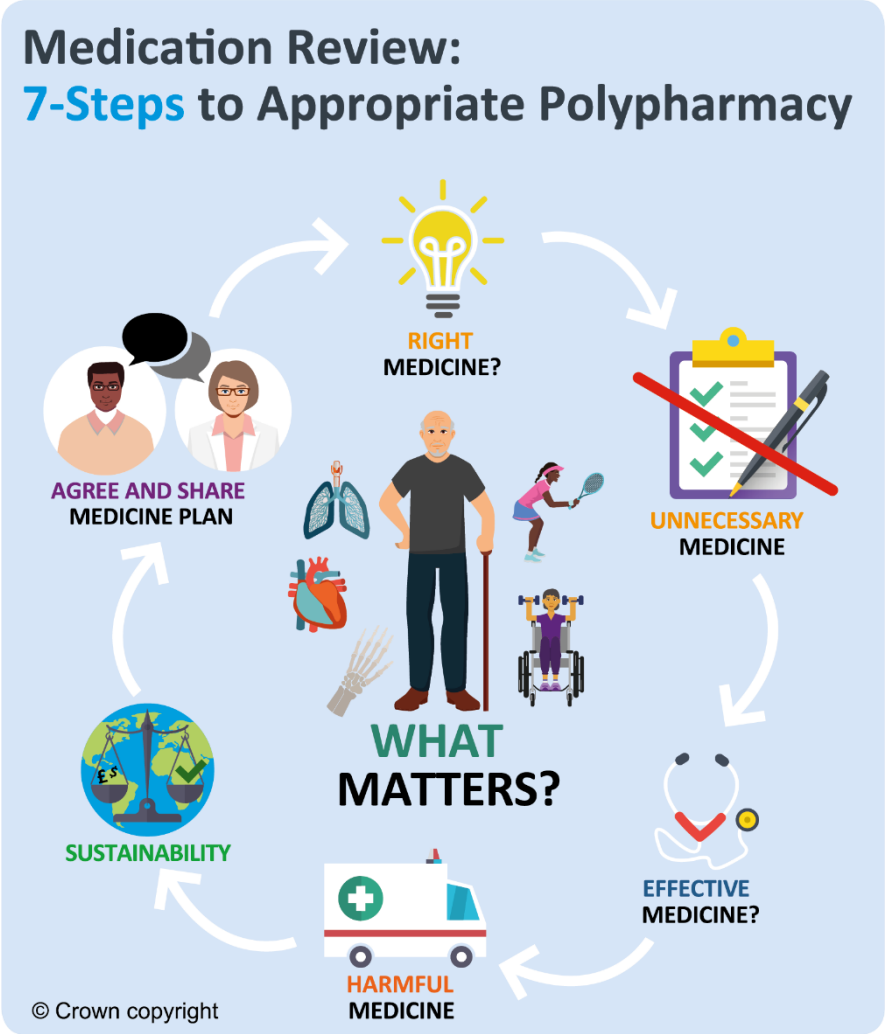
Figure 1: Respiratory Prescribing Spend in primary care in 2021/22

BNF Chapter	**Total Spend**		
Drugs used in respiratory conditions	£112,923,078		
BNF Section	**Section Spend**	**Class of Respiratory Medicine**	**Spend**
Bronchodilators	£32,359,781	Combination LABA & LAMA	£8,281,021
		Combination SABA & SAMA	£68,227
		LABA	£1,117,516
		LAMA	£14,396,961
		Other	£216,315
		SABA	£7,908,619
		SAMA	£130,846
		Theophylline	£240,276
Corticosteroids (respiratory)	£76,947,302	Combination ICS & LABA	£50,089,407
		Combination ICS, LABA & LAMA	£19,421,269
		ICS	£7,436,626
Cromoglycate & LRA	£1,028,597	LRA	£1,000,430
		Miscellaneous	£28,167
Mucolytics	£2,587,398	Mucolytics for CF	£1,726,179
		Mucolytics for COPD	£861,220

What are the benefits of guidance to patients?

This guidance focuses on quality prescribing and should result in improvements in patient care and treatment of respiratory conditions. The 7-Steps medication review process promotes a shared decision-making approach to medicine reviews and places the individual at the centre of their care to ensure prescribing is effective and appropriate for them. People will be encouraged to self-manage their condition where appropriate and be asked 'what matters to you?' [9] to support a holistic approach to care in line with the Scottish Government's polypharmacy guidance. [5]

Figure 2: The 7-Steps medicine review process



What are the benefits to Health Boards?
Optimising therapy through shared decision-making will lead to improved person-centred care. Appropriate and effective use of pharmacological therapy for respiratory conditions will facilitate better outcomes for individuals with respiratory conditions and should therefore reduce health care utilisation and hospital admissions due to respiratory disease.

There is an increase in the volume of prescriptions dispensed and the cost of medicines year on year. Appropriate review of respiratory prescribing should improve medication safety and should ensure cost effective prescribing.

4. Polypharmacy

Person-centred respiratory prescribing

Medication is by far the most common form of medical intervention for many acute and chronic conditions with around 280,000 items prescribed every day in Scotland, around 21,000 items for respiratory medicines. [10] The term polypharmacy means "many medications" and is defined to be present when a patient takes two or more medications. Drug therapy can be highly effective in preventing disease or slowing disease progression, with guidelines for single diseases recommending the use of a variety of evidence-based drug treatments. However, there is often a mismatch between prescribing guidelines for specific medical conditions and the range of clinical complexity found in individuals. It is important to note that polypharmacy is not necessarily a bad thing, it can be both rational and required.

It is recommended that patients are reviewed using the 7-Steps process outlined in the Scottish Government's Polypharmacy guidance[8] with accredited Polypharmacy training available on TURAS for prescribers (three points of external CPD by Royal College of Physicians, United Kingdom). The training equips healthcare professionals (including doctors, nurses and pharmacists) to undertake comprehensive person-centred medicines reviews. The training can be accessed at NHS Education for Scotland on TURAS learn. Find more information on the iSIMPATHY website.

Environmental impact of polypharmacy and healthcare

Over-prescribing is commonplace, accounting for at least 10% of all prescribed medications. It is estimated that up to 11% of unplanned hospital admissions are attributed to harm from medicines. [5] About half of these admissions are deemed to be preventable, through methods such as effective medicine review, following the 7-Steps polypharmacy review process.

The healthcare industry is increasingly asked to account for the negative environmental impact generated through providing medical care. In Scotland, every 10 days a 10-tonne truck of medicines waste (returned to community and hospital pharmacies) is transported for incineration. These are the associated costs for incineration; travel costs and the environment impact (see Figure 3 below) in addition to the direct costs of the unused medication.

Reduction of medicines waste can be achieved by ensuring appropriate prescribing and initiation of medicines, regular person-centred medication reviews and deprescribing where appropriate.

Reducing waste from medicines has a double carbon benefit by

- reducing upstream emissions e.g. in distribution
- downstream emissions, with fewer medicines to be disposed of

Medicines that are disposed of in general waste, poured down the sink or flushed down the toilet, increase the risk of environmental harm. Any remaining propellant gas in metered dose inhalers can be safely destroyed by incineration, which avoids it leaking into the atmosphere. Residues from medicines which are unused, not properly disposed of, or from those that pass through the body, can be found in water, soil and sludge and in organisms at all stages of their lifecycles. Further information is available using the SEPA data visualisation tool for Pharmaceuticals in the Water Environment.

Unused or unwanted medicines should be returned to community pharmacy for safe disposal or recycling where available.

Figure 3: Annual cost of managing medicines waste in Scotland

5. Asthma

Asthma

Over five million people are receiving asthma treatment in the UK. Asthma accounts for 2-3% of primary care consultations, 60,000 hospital admissions, and 200,000 bed days per year in the UK.[11]

Summary of recommendations in asthma

In all individuals with asthma

- recommend that a patient prescribed six or more inhalers annually is a trigger for timely, priority review - an immediate prescription may be necessary but review should take place before authorisation of the next prescription
- review patients on SABA inhalers alone, clarifying the diagnosis and establishing reasons for SABA only use
- review patients with asthma prescribed SABA and LABA without ICS
- review patients with asthma who have been prescribed an ICS inhaler and do not currently order on their repeat prescription - assess adherence and understanding of treatment to establish appropriate use of SABA inhalers
- review inappropriate use of high strength corticosteroid inhalers (maintaining patients at the lowest possible dose of inhaled corticosteroid)
- reductions in high dose ICS should be considered every three months, decreasing the dose by approximately 25–50% each time, arranging regular review as treatment is reduced
- issue a steroid treatment card to patients on inhaled high dose corticosteroids - steroid emergency card may also be required
- review montelukast at four to eight weeks following initiation to ensure a response and that therapy is still required

In severe asthma

- identify patients with severe asthma and where modifiable risk factors are addressed and asthma care remains suboptimal, refer to secondary care for treatment optimisation

In children with asthma

Whilst this guidance is not for children and prescribers should refer to guidance on asthma management in children, there are two medication safety points to highlight:

- record regular growth monitoring when treating children with ICS
- ensure children on medium / high-dose ICS are under the care of a specialist paediatrician

Principles of prescribing for asthma

Asthma is a chronic respiratory condition associated with airways inflammation and hyper-responsiveness.

The aim of treatment is control of the disease with:

- no daytime symptoms
- no night-time waking due to asthma
- no need for rescue medication
- no asthma attacks
- no limitations on activity including exercise
- minimal side effects from medication

Inhaled therapy is used as the main treatment of asthma, which should be started at the level most appropriate to the initial severity of asthma symptoms. The aim is to achieve and maintain early control by increasing treatment as necessary and decreasing unnecessary treatment when control is good. [12] Personalised asthma action plans, agreed with the health care professional, empower individuals to gain control using the minimum dosage of inhaled corticosteroid. [12]

Inhaled corticosteroids are the most effective preventer drug to achieve treatment goals. Add-on therapy, including long-acting beta agonists (LABA), leukotriene antagonists, long-acting muscarinic antagonist (LAMA) and theophyllines, should only be initiated after checks on inhaler technique, adherence and elimination of trigger factors. People with asthma should be reviewed at least annually to determine whether their existing treatment regime is adequately managing their symptoms.

Inhaler device selection is important. People with asthma should receive training on how to use their inhaler device and be able to use it. [12] The environmental impact of inhalers is a key consideration and prescribers are asked to consider inhalers with a lower global warming potential where appropriate for the individual (see chapter 10).

To prescribe most effectively for people with asthma, we recommend the ‘what matters to you?’ principles and the Polypharmacy 7-Steps approach. Table 1 outlines the main principle for treating patients with asthma.

Table 1: Principles of treating patients with asthma

	Polypharmacy review 7-Steps	
1	What matters to the patient?	• Ask the patient what matters to them? • How does the condition affect patients' day to day life/activities? • Take account of co-morbidities when prescribing for asthma, by using the Polypharmacy 7-Steps approach • Do environmental prescribing issues matter? (see chapter 10)
2	Identify essential drug therapy	• Asthma diagnosis confirmed? • Fractional exhaled nitric oxide (FeNO) test could be used as an optional investigation to test for eosinophilic inflammation when there is diagnostic uncertainty [12] • Ensure asthma therapy is optimised as per local / SIGN / BTS guidelines [12] • Assess adherence, review inhaler technique and eliminate trigger factors prior to initiating or adjusting therapy • Confirm ongoing need for and effectiveness of medication and screen for side effects
3	Does the patient take unnecessary drug therapy?	• Assess adherence and ensure patient understands treatment regime, using an asthma action plan. • Discuss SABA use with patients prescribed more than three SABAs annually as this is a marker of poor control • Consider the use of Maintenance and Reliever therapy (MART) regimen in patients where there is poor control or adherence when on separate medium dose ICS, LABA and SABA [12] • When asthma is controlled and stable, clinicians should consider stepping down inhaled corticosteroid (ICS) treatment, slowly, every three months reducing by 25-50% each time, monitoring for deterioration [12]
4	Are therapeutic objectives being achieved?	• Can the patient use their inhalers properly? • Any patient who has asthma medicine started or changed should be reviewed within three months

		• Medication should be titrated to a dose which balances maximum clinical efficacy with minimal risk and stopped if found to be ineffective or if adverse effects outweigh benefits
		• If asthma is not adequately controlled on recommended initial or additional therapies, as per BTS/ SIGN [12], patient should be referred for specialist assessment
		• Exacerbations should be considered as an opportunity to review therapy, optimise treatment and ensure self-management plans are updated
		• Once the dose is stable and effectiveness has been established, ongoing review should occur as clinically appropriate, with follow up at least annually if asthma control has been achieved
		• For environmental considerations, consider switch to DPI inhalers for patients with asthma who:
		  ○ have an adequate inspiratory flow (e.g., use an In-Check device)
		  ○ have been stable for two years
		  ○ have had no asthma attack for two years
		  ○ have never been admitted to hospital /ITU
		  ○ are not under secondary care review
		• If there is any concern that an individual is at higher risk of asthma attack, or risk of severe attack, then remain on a pMDI reliever plus a spacer device [12] (see advice in table 14, SIGN 158)
		• Consider switch to pMDI with lower global-warming potential where this is clinically appropriate (e.g. Salamol®, Airomir®)
		• Ensure awareness of how allergies (pet, pollen, dust), air pollution can affect respiratory conditions
		• Vaccinations should be offered if not up to date as per national guidance
		• Individuals should be encouraged to engage in appropriate physical activity - social prescribing such as exercise would be dependent on ability
		• A breathing exercise program can reduce symptoms
		• Smoking cessation should be advised and the adverse effects of smoking on children highlighted. Offer appropriate support - signpost patients to the NHS inform Quit Your Way Scotland website (includes community pharmacy services)
		• Weight reduction should be considered in patients who are overweight (BMI 25 – 29.9) or obese (BMI >30) to reduce respiratory symptoms [12]

5	Is the patient at risk of Adverse Drug Reactions (ADR)s or suffer actual ADRs?	• Consider risk factors for future risk of asthma attack and address these when prescribing - for instance, patients:
		  ○ with an asthma attack in the past
		  ○ who have received more than one course of oral corticosteroids in one year
		  ○ who have received more than six SABA inhalers a year should be prioritised for an asthma review
		  ○ on high dose inhaled steroids
		  ○ with multiple morbidities e.g. COPD, depression, Gastro-oesophageal reflux disease
		  ○ with poor asthma control
		  ○ who smoke
		• Steroid treatment cards should be provided to patients on high dose steroids (both oral and inhaled). A steroid emergency card may also be required. A national review will establish how to identify patients utilising Scottish Therapeutics Utility (STU) following the Health Improvement Scotland (HIS) guidance Steroid Emergency Card [13]
		• Review risk of osteoporosis if on long term or frequent (more than three or four courses a year) oral corticosteroid treatment [14]
		• Take measures to reduce the risk of and increase awareness of oral thrush - ensure correct technique to reduce incidence - a spacer device is recommended for use with a pMDI and will reduce oral thrush side effects
		• Yellow card reporting of true ADRs

6	Sustainability	• Opportunities for sustainable prescribing and cost minimisation should be explored but only considered if effectiveness, safety or adherence would not be comprised • For new drugs, ensure prescribing is in line with Health Board formulary recommendations
7	Is the patient willing and able to take drug therapy as intended?	• A personalised asthma action plan is key to this approach, with focus on inhaler technique, peak flow monitoring, worsening symptom advice, appropriate use of a spacer and avoidance of new trigger factors • Make patient aware of support information e.g. the My Lungs My Life website (appendix 1) • Non-attenders should be followed up – alternative strategies to encourage engagement may be

		required (e.g. through community pharmacy / Near Me / telehealth acknowledging limitations) • Agree with the patient arrangements for repeat prescribing - signpost to Medicines Care and Review service in Community Pharmacy where appropriate

Prescribing issues to address

The issues identified are priority areas of prescribing, where there is unwarranted variation within Health Boards and where accurate prescribing data can be provided. Ensuring asthma medicines are reviewed and optimised will reduce this unwarranted variation. The indicators focus on ensuring quality prescribing and any of the recommendations made follow national clinical guidance. [12] The indicators included are as follows:

- prescribing of short-acting beta-agonists (SABA) per annum
- prescribing of inhaled high dose corticosteroids
- prescribing of long-acting beta-agonists (LABA) without inhaled corticosteroids (ICS)
- prescribing of SABA only
- prescribing of Leukotriene receptor antagonists

Prescribing of short-acting beta-agonists (SABA)

Evidence for review of SABA

It is essential that patients who appear to be overusing SABA inhalers are assessed for control of symptoms. Asthma control test (ACT) questions[15] highlight that a patient is not controlled if they use a SABA inhaler three or more times in a week.[12] The National Review of Asthma Deaths (NRAD) report[16] found that patients who used more than 12 inhalers per year were at a greater risk of uncontrolled asthma and sudden death. There was evidence of under-prescribing of preventer medication. Use of 12 SABAs in one year implies the use of 46 puffs in one week and for six SABAs a year is 23 puffs a week.[17] In the SABINA study,[18] an association across all asthma severities was found between high SABA use, of more than three inhalers per year, and an increase in exacerbation rates and healthcare utilisation. [19] It is crucial that patients understand the importance of when and how to use their inhalers and of adherence to therapy with their preventer inhaler.[17]

The main focus of an asthma review is to ensure that the individuals' condition is well controlled, they are prescribed the optimum inhaler therapy in alignment with current guidance and are using their inhalers effectively. We know that there are many people with asthma in Scotland who are prescribed six or more SABA inhalers in 12 months (see chart 1 below). This is associated with a higher rate of exacerbations and hospitalisation.[18]

Following clinical consensus regarding asthma control, this indicator has been reduced from the previous 12 SABA inhalers prescribed annually to recommend that a patient prescribed six or more inhalers annually is a trigger for timely, priority review (see chart 1). This should ideally take place before the issue of the next prescription.

The guide includes a chart of people prescribed three or more SABA inhalers as an aspirational level, as a person with well-controlled asthma would need no more than this (see chart 2). This should be discussed at the annual routine review. This indicator is a guide and is unable to distinguish between people with Asthma and COPD.

It should be noted that emergency supplies of SABA inhalers are possible to obtain from the community pharmacy. Liaison with community pharmacy colleagues is advised to help reach those people with asthma who may be poorly controlled and do not attend asthma reviews.

The Scottish Therapeutic Utility (STU) software (chapter 12) is recommended, to support GP Practices to identify individuals with asthma who are over-reliant on SABA inhalers using practice coding.

Chart 1: People prescribed six or more short-acting beta-agonists (SABA) inhalers per annum

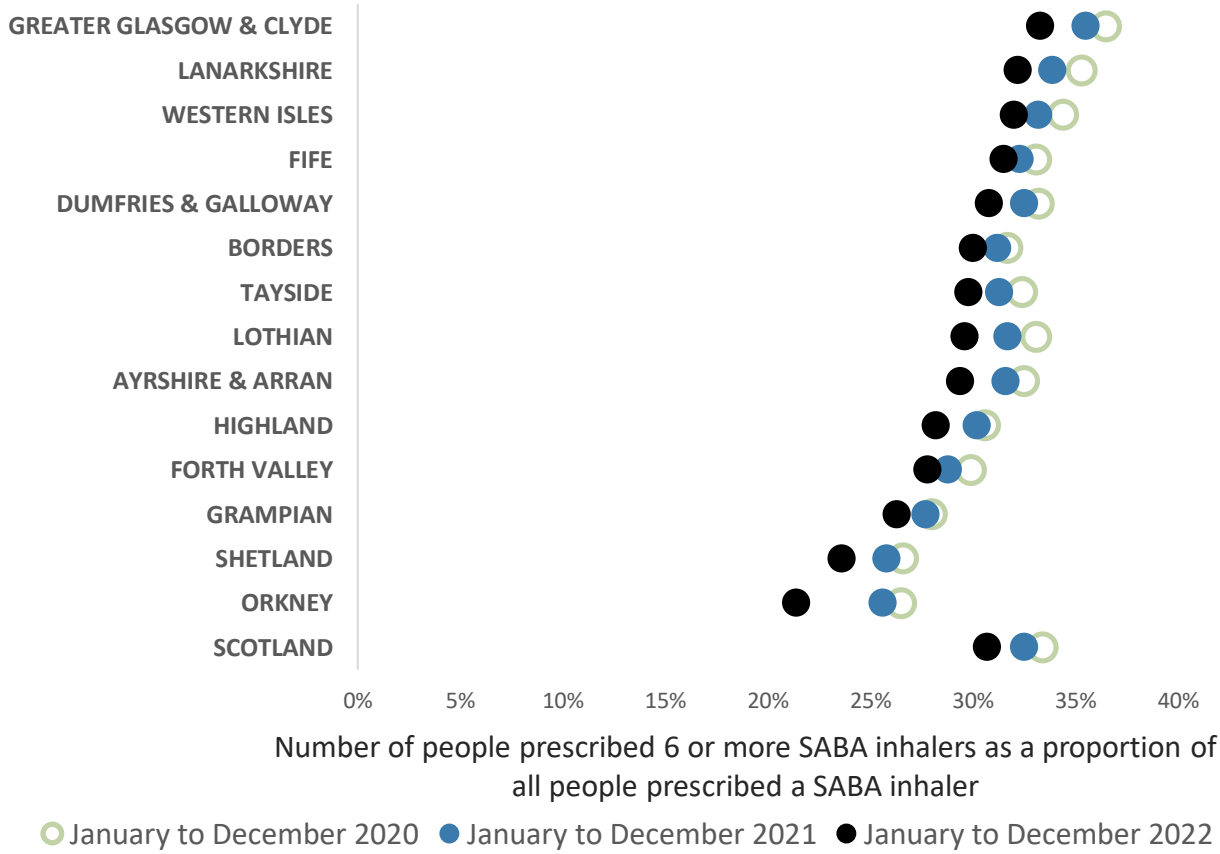
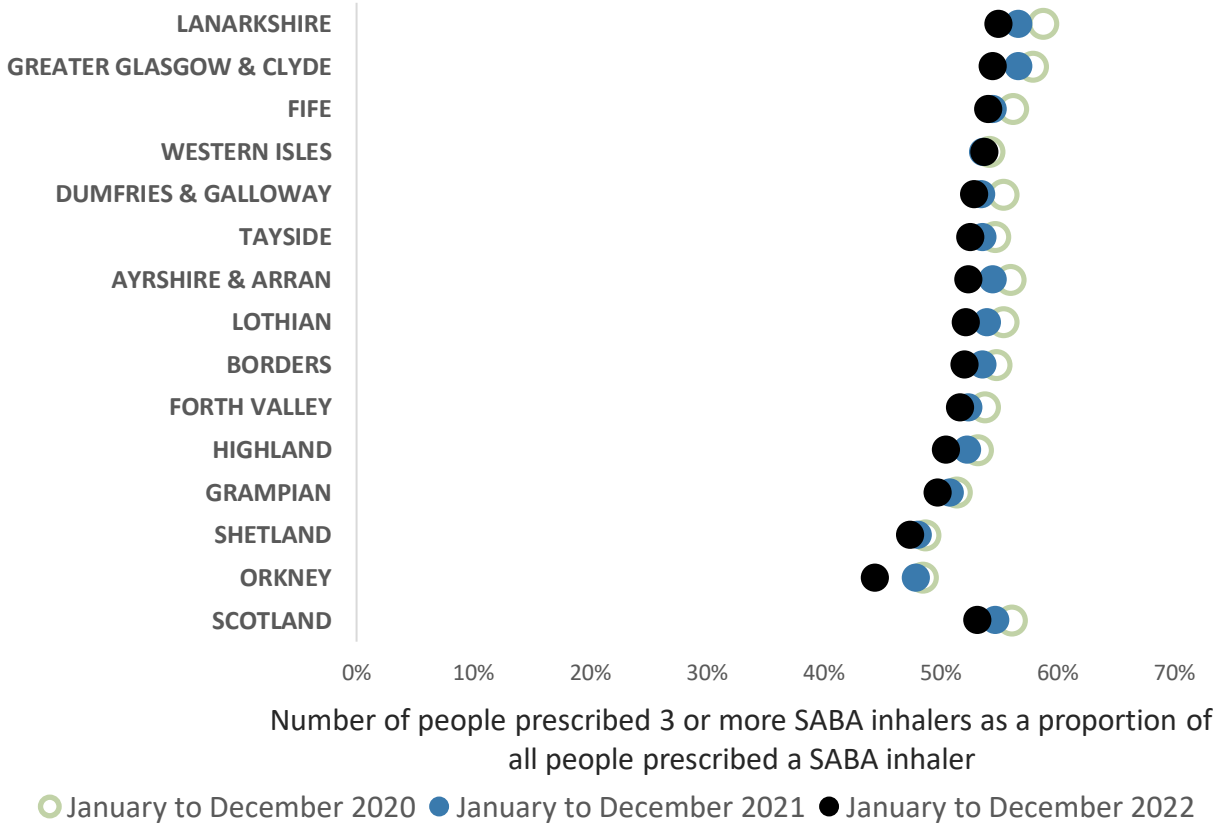


Chart 2: People prescribed three or more short-acting beta-agonist (SABA) inhalers per annum



Charts one and two highlight that the number of SABA inhalers that patients have received annually has remained fairly constant, after a slight increase during April 2020 – March 2021 across NHS Scotland. This may be due to prescribing of SABA inhalers in response to the COVID-19 pandemic.

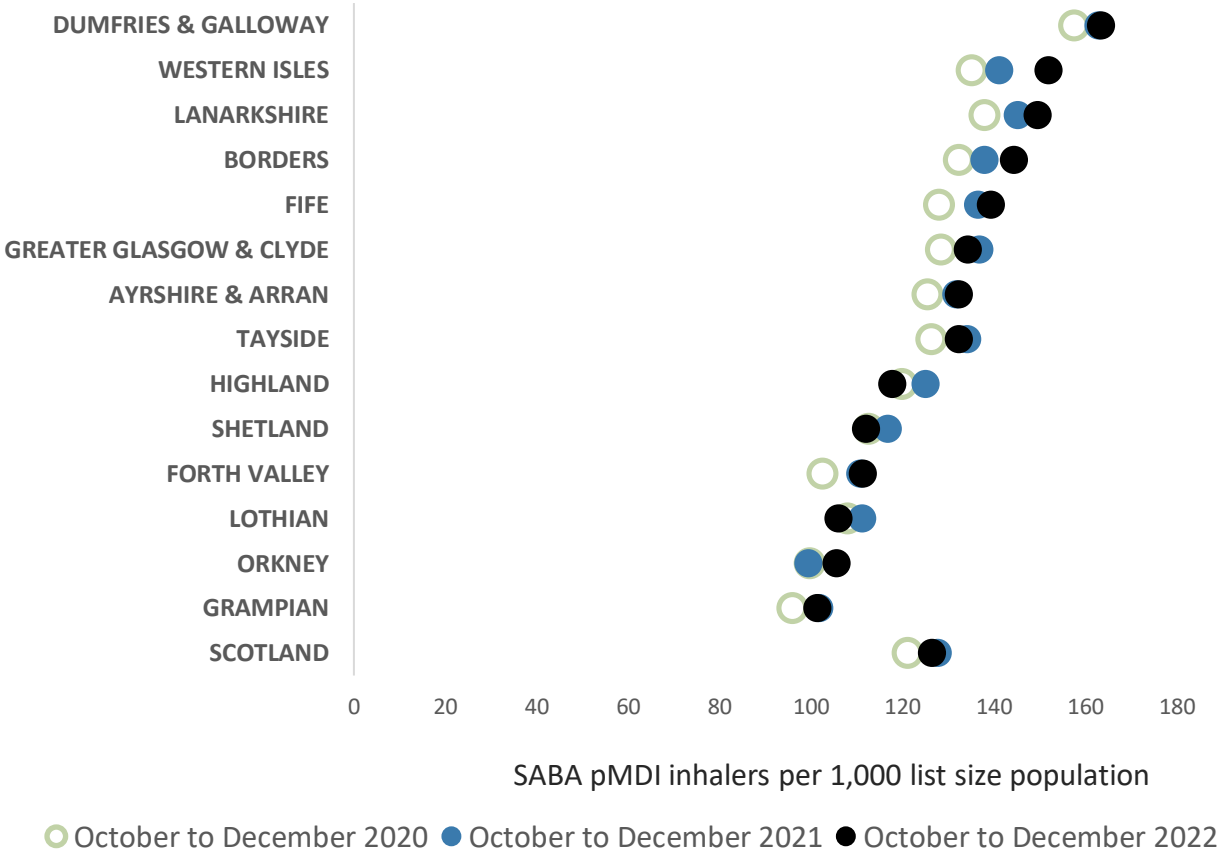
Prescribing of inhalers with dose counters may assist in monitoring adherence with inhalers and to ensure that individuals know how many doses remain in the inhalers to prevent medicine waste. [20]

Review of high SABA pMDI use

A recent study found that SABA inhalers accounted for the majority of pMDIs prescribed and advocated better disease control to reduce SABA inhaler use and therefore CO2 emissions [21] (see environmental chapter). Approximately 70% of all inhalers in NHS Scotland are prescribed as an pMDI. The UK has a high proportion of pMDI use (70%) compared with the rest of Europe (< 50%) and Scandinavia (10–30%). Figures from Scandinavia show a lower rate of deaths. [22]

Reviewing patients regularly and providing education on good control of respiratory disease and optimising treatments will reduce SABA inhaler use, improving patient care and disease control. This will also support reduction in CO2 emissions, which is a target for NHS Scotland (see environmental chapter). Chart 3 below highlights the proportion of SABA pMDI inhalers alone prescribed in each NHS Board.

Chart 3: Number of SABA pMDI inhalers prescribed per 1,000 list size



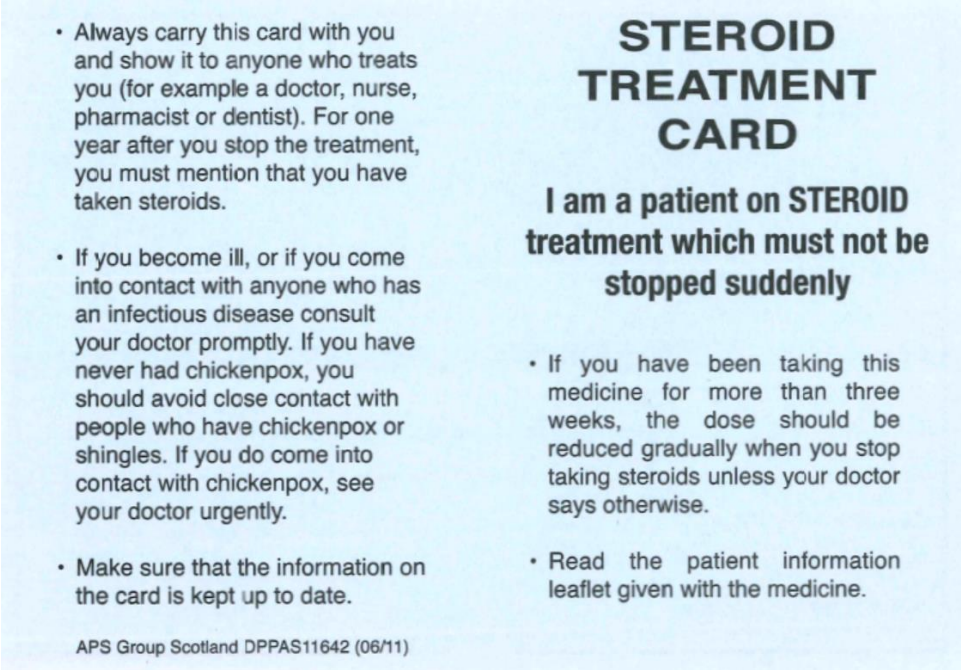
Prescribing of high dose corticosteroid inhalers

There are safety concerns regarding the inappropriate use of high strength corticosteroid inhalers and the importance of ensuring that the patient's steroid load is kept to the minimum level whilst effectively treating symptoms. It is recognised that some patients will require treatment with high-dose ICS. This indicator acts as a guide for highlighting use of inhaled high dose corticosteroids but is unable to distinguish between patients with asthma and COPD. The STU software will allow GP practices to identify patients within each cohort for review.

Patients on inhaled high dose corticosteroids (or multiple steroid preparations) should be issued with a steroid treatment card (blue), see figure 4. There is an additional steroid emergency card (figure 5) which alerts patients who are dependent on long term steroids and at risk of adrenal insufficiency to the potentially serious, systemic side effects from them. A full list of steroid doses to assist with determining

who should be issued with a steroid emergency card (red) is contained within the Healthcare Improvement Scotland advice [13] and STU software will assist identification of these patients. The most concerning side effect is adrenal suppression, others include growth failure; reduced bone density; cataracts and glaucoma; anxiety and depression; and diabetes mellitus. [23]

Figure 4: Steroid treatment card



- Always carry this card with you and show it to anyone who treats you (for example a doctor, nurse, pharmacist or dentist). For one year after you stop the treatment, you must mention that you have taken steroids.
- If you become ill, or if you come into contact with anyone who has an infectious disease consult your doctor promptly. If you have never had chickenpox, you should avoid close contact with people who have chickenpox or shingles. If you do come into contact with chickenpox, see your doctor urgently.
- Make sure that the information on the card is kept up to date.

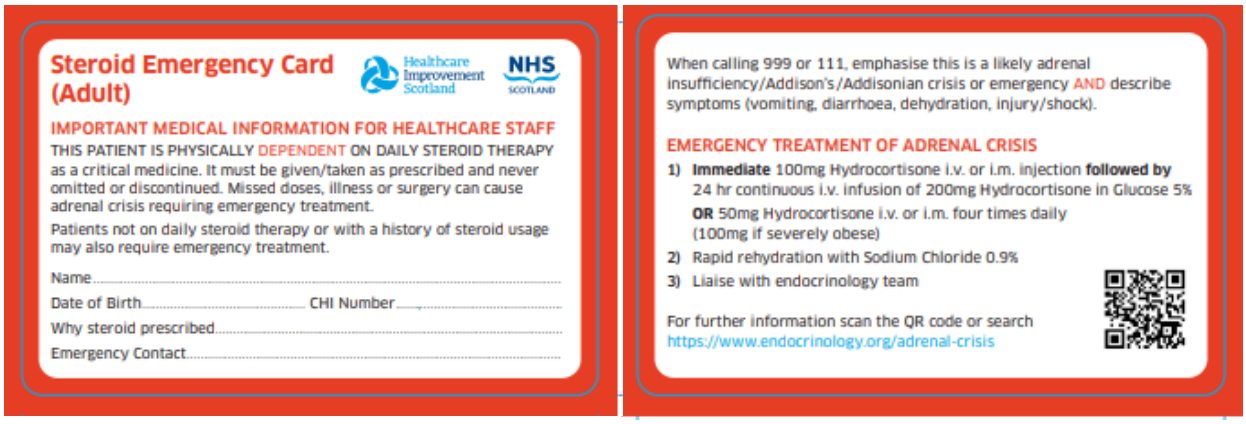
APS Group Scotland DPPAS11642 (06/11)

STEROID TREATMENT CARD

I am a patient on STEROID treatment which must not be stopped suddenly

- If you have been taking this medicine for more than three weeks, the dose should be reduced gradually when you stop taking steroids unless your doctor says otherwise.
- Read the patient information leaflet given with the medicine.

Figure 5: Steroid emergency card



Steroid Emergency Card (Adult)

Healthcare Improvement Scotland

NHS SCOTLAND

IMPORTANT MEDICAL INFORMATION FOR HEALTHCARE STAFF

THIS PATIENT IS PHYSICALLY DEPENDENT ON DAILY STEROID THERAPY as a critical medicine. It must be given/taken as prescribed and never omitted or discontinued. Missed doses, illness or surgery can cause adrenal crisis requiring emergency treatment.

Patients not on daily steroid therapy or with a history of steroid usage may also require emergency treatment.

Name.....

Date of Birth..... CHI Number.....

Why steroid prescribed.....

Emergency Contact.....

When calling 999 or 111, emphasise this is a likely adrenal insufficiency/Addison's/Addisonian crisis or emergency AND describe symptoms (vomiting, diarrhoea, dehydration, injury/shock).

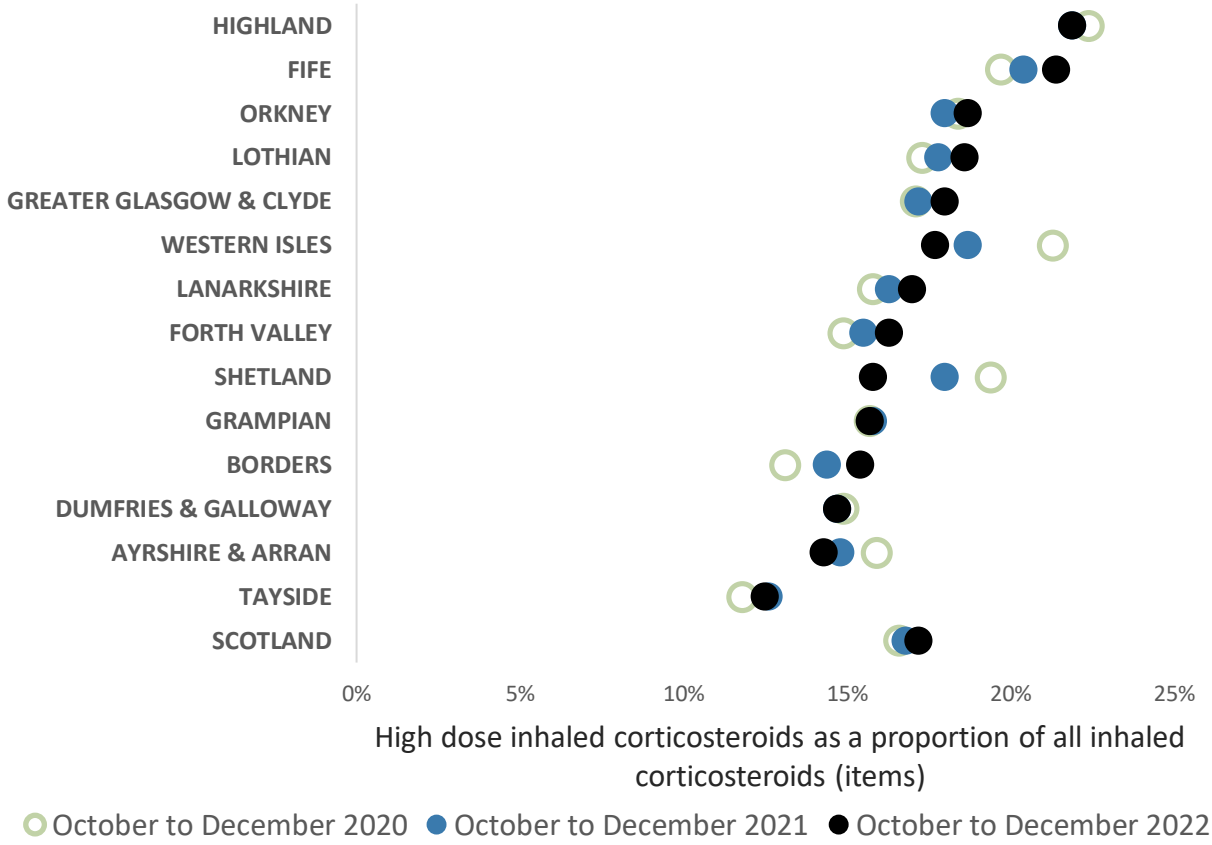
EMERGENCY TREATMENT OF ADRENAL CRISIS

1) **Immediate** 100mg Hydrocortisone i.v. or i.m. injection **followed by** 24 hr continuous i.v. infusion of 200mg Hydrocortisone in Glucose 5%
   OR 50mg Hydrocortisone i.v. or i.m. four times daily (100mg if severely obese)
2) Rapid rehydration with Sodium Chloride 0.9%
3) Liaise with endocrinology team

For further information scan the QR code or search https://www.endocrinology.org/adrenal-crisis

Chart 4 shows that high dose corticosteroid inhaler prescribing has increased in most NHS boards since 2020.

Chart 4: High dose corticosteroid inhalers as a percentage of all corticosteroid inhaler items (using 2019 SIGN/BTS classification of high dose)



Whilst this guidance is not for children and prescribers should refer to guidance on asthma management in children, there are two of medication safety points to highlight. Prescribing of high dose inhaled corticosteroids in children, aged under 12 years, is of particular concern due to long term safety concerns. Children on high dose corticosteroids should be reviewed and under the care of paediatricians with a special interest in respiratory medicine. Transition from child to adult services should be considered for children with unstable asthma or co-existing risks, such as food allergies and reviews carried out to facilitate this. There is a report available using the STU utility to identify high dose corticosteroid use in children under 12 years.

When treating children with ICS [12] :

- it is important to record growth (Height and weight centile) on an annual basis using the same equipment [12] (unreliable indicator of adrenal suppression) - if there are concerns regarding growth, advice should be sought from a paediatrician
- high-dose ICS should be used only under the care of a specialist paediatrician

- adrenal insufficiency should be considered in any child with shock and/or reduced consciousness who is maintained on ICS

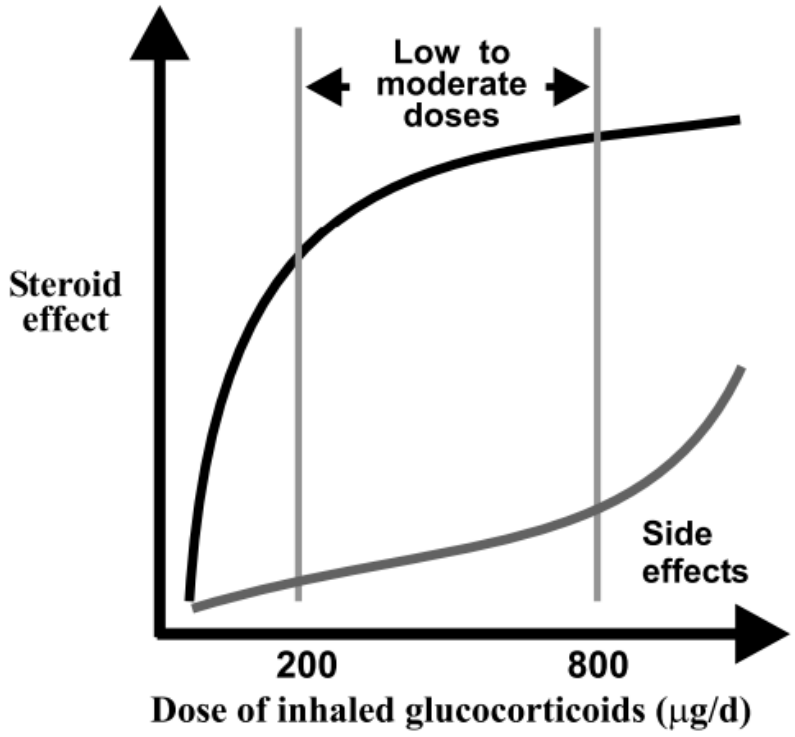
Evidence for review of high dose inhaled corticosteroids
SIGN 158 recommends the following for adults and children.

Patients should be maintained at the lowest possible dose of inhaled corticosteroid. Reduction in inhaled corticosteroid dose should be slow as patients deteriorate at different rates. Reductions should be considered every three months, decreasing the dose by approximately 25–50% each time.

It is important to arrange for a regular review of patients as treatment is reduced. When deciding the rate of reduction, it is important to take into account the following aspects: the severity of asthma, the side effects of the treatment, time on current dose, the beneficial effect achieved, and patient preference.

The dose – response curve for inhaled corticosteroids (figure 6) [24] shows the difference in clinical effect and side effects when a corticosteroid dose is increased. At doses of 800 micrograms per day and above, the clinical benefit of increasing inhaled corticosteroid dose is outweighed by increase in side effects.

Figure 6: Dose – response curve for inhaled corticosteroids [24]

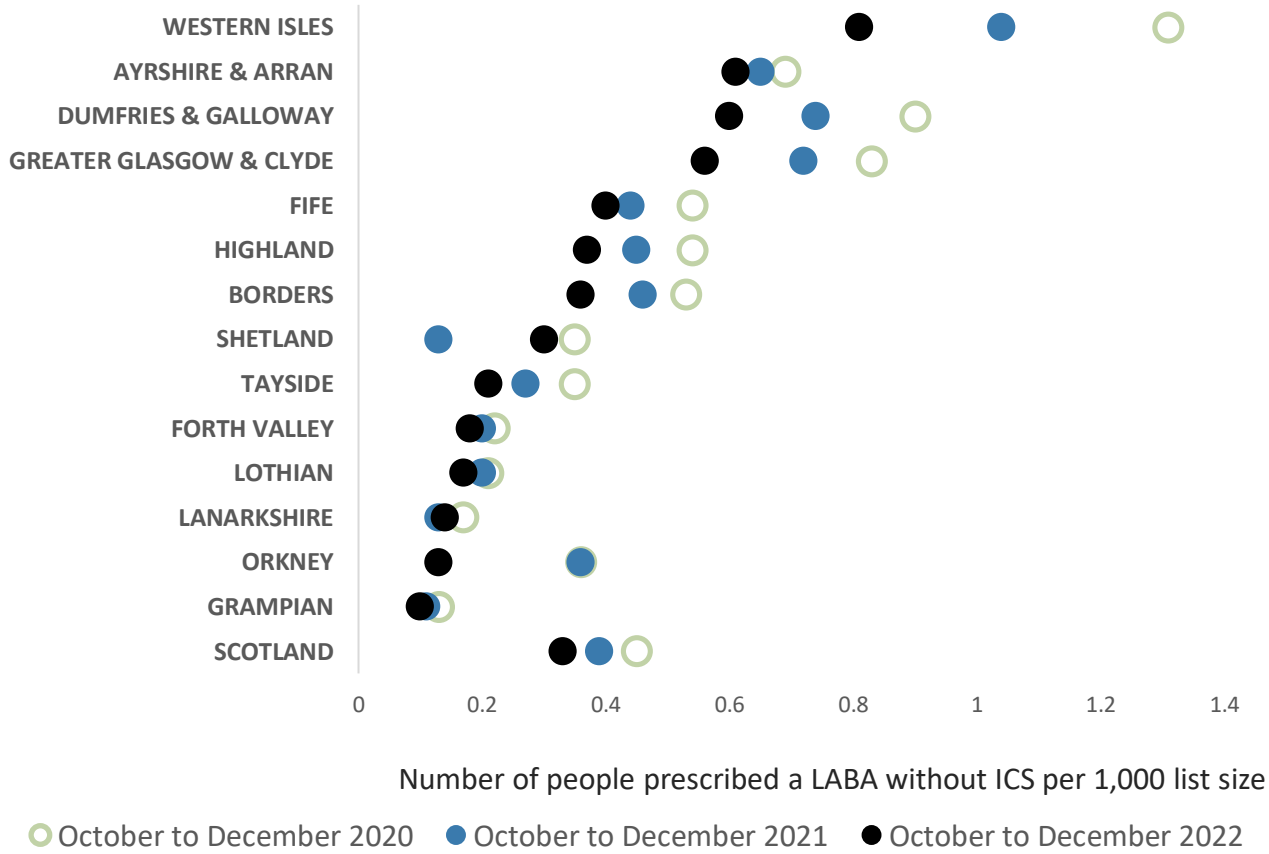


Number of Inhaled corticosteroids prescribed per annum
People who have been prescribed an ICS inhaler and do not order on repeat prescription should be checked for adherence and understanding of preventer treatment and to establish appropriate use of SABA inhalers. The National Review of Asthma Deaths (NRAD) report [16] highlighted that some people at risk of uncontrolled asthma / sudden death had under used preventer medicines. Most ICS inhalers (pMDIs and DPIs) have a dose counter and that may be used to aid understanding of adherence based on an individual's asthma management plan.

Conversely, some people may over-order inhalers for various reasons, such as poor understanding of therapy. A review would be advised to explore this. Use of the STU software is recommended for GP practices to identify patients receiving 14 or more ICS inhalers a year (see chapter 12).

Prescribing of SABA plus LABA without ICS
The NRAD report [16] also highlighted that patients who were at higher risk of death due to asthma had a LABA prescribed without an ICS. As is clear from chart 5 the number of people without an ICS prescribed is small and continues to reduce. Some of these patients may have a COPD diagnosis in which case prescribing of a LABA without an ICS would be reasonable.

Chart 5: People prescribed a LABA without ICS per 1000 patient size



Prescribing of SABA only

This indicator highlights the proportion of patients who receive a SABA inhaler in the absence of other inhalers. SIGN 158 states that on diagnosis of asthma, patients be considered for monitored initiation on low dose ICS plus a SABA as required. Patients on SABA inhalers alone should be reviewed, establishing reasons for SABA only use, such as COPD diagnosis, viral wheeze and COVID-19 symptoms.

Using STU software is recommended within GP practices and will allow identification of individuals coded with asthma on a SABA inhaler only (see chapter 12).

Chart 6: Prescribing of SABA only (in absence of other inhalers)

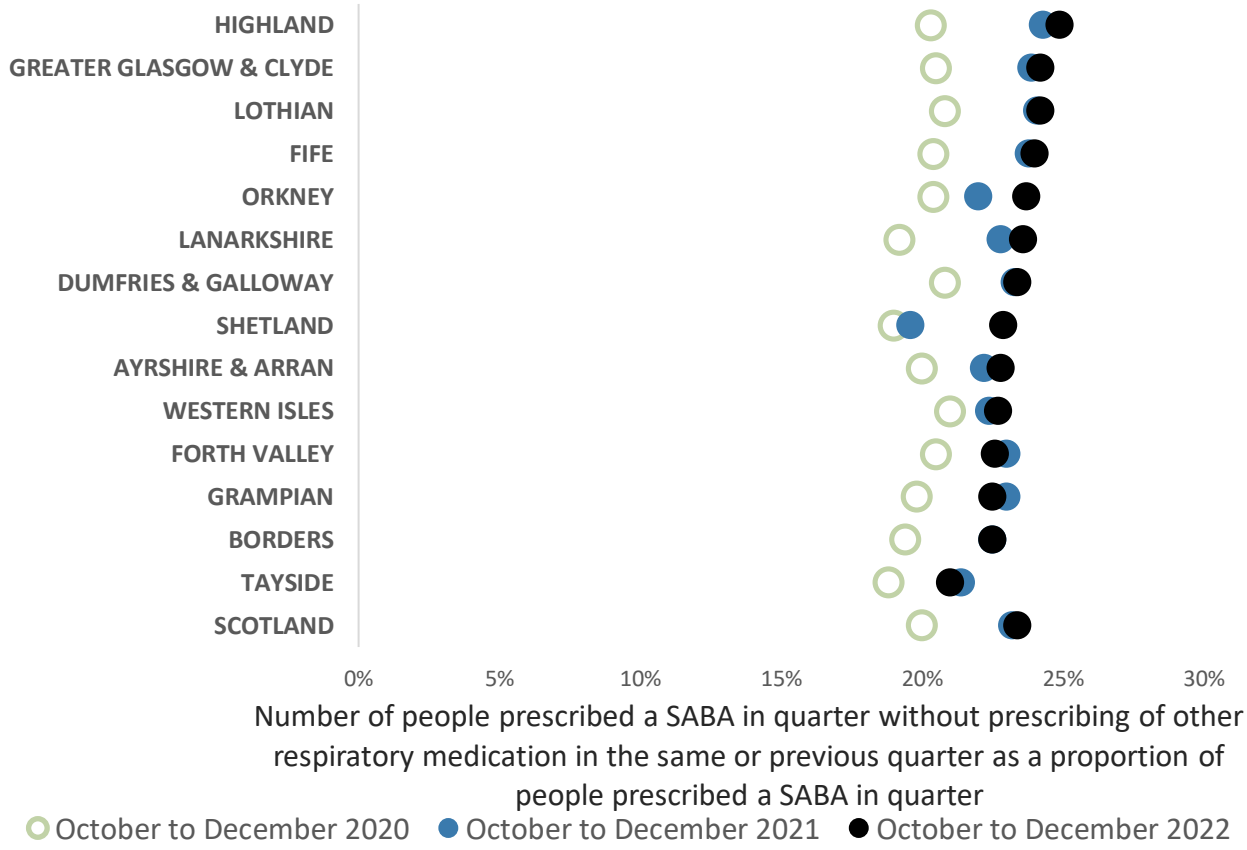


Chart 6 shows that in NHS Scotland approximately 23% of people being prescribed a SABA inhaler are not prescribed other inhaler therapy. As per national asthma and COPD guidelines, very limited numbers of patients should be prescribed SABA inhalers only.

Prescribing of Montelukast (leukotriene receptor antagonist)
Montelukast can be used as an additional add on therapy for asthma in adults. If control remains suboptimal after the addition of an inhaled LABA to low-dose ICS then either:

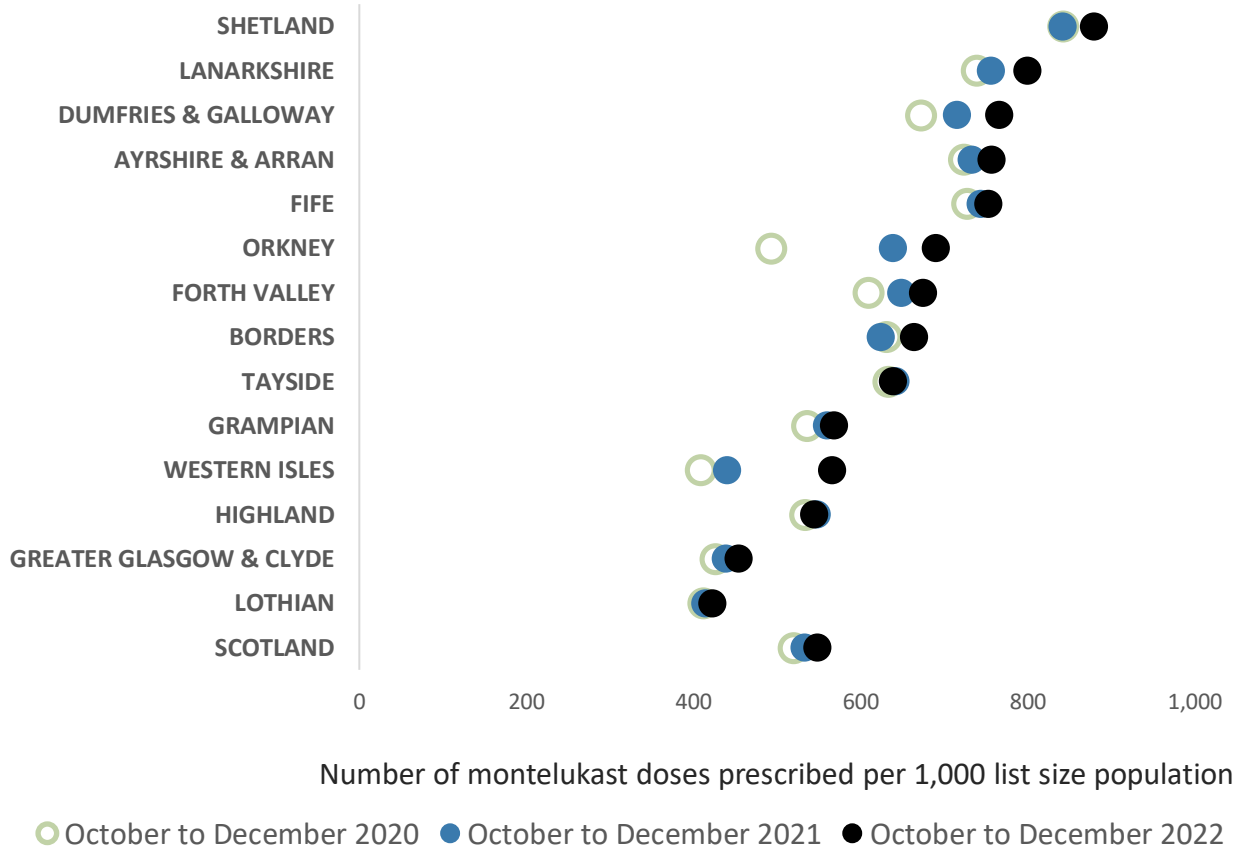
- increase the dose of inhaled corticosteroids to medium dose

or

- consider adding a leukotriene receptor antagonist [12]

Chart 7 below highlights prescribing of Montelukast, which shows a variance in NHS Boards across Scotland. Overall prescribing appears to have increased. Montelukast should be reviewed four to eight weeks following initiation [25] to ensure that there has been a response to therapy and that it is still required.

Chart 7: Number of Montelukast doses prescribed per 1000 list size of population



The Medicines and Healthcare products Regulatory agency (MHRA) issued a reminder regarding the known risks of neuropsychiatric reactions with montelukast.[26]

A recent EU Review [27] of montelukast confirmed the known risks and that the magnitude was unchanged. The review highlighted that there had been some delays in recognising that neuropsychiatric reactions were a potential side effect to montelukast. Consider the benefits and risks of continuation of prescribing, should these side effects occur.

Severe Asthma

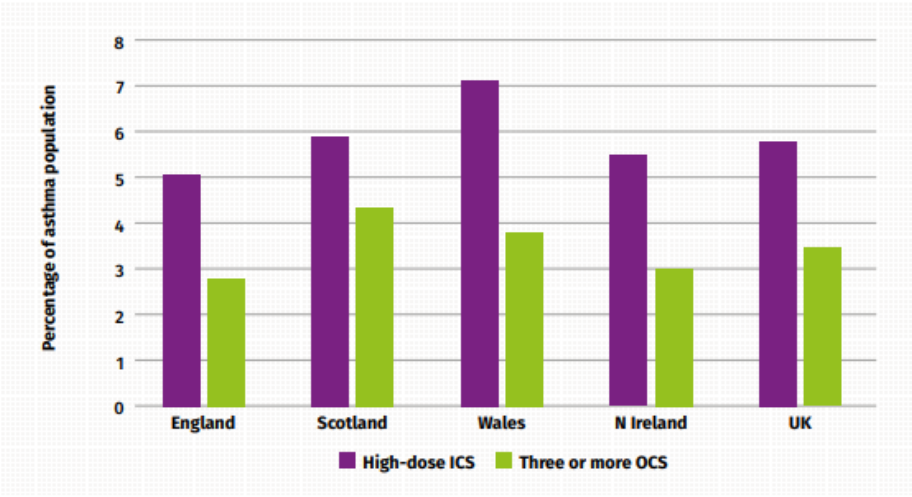
Severe asthma is defined as asthma that is uncontrolled despite adherence to optimised maximal inhaled therapy and management of contributory factors or worsens when high dose treatment is decreased. [28]

Poorly controlled and/or unrecognised severe asthma is a significant problem, leading to morbidity and mortality. Severe asthma is associated with poor asthma control, impaired lung function and repeat exposure to oral corticosteroids (OCS) which can lead to further OCS-related adverse effects such as diabetes, adrenal insufficiency, and osteoporosis.

Severe asthma is estimated to affect 3% to 5% of the asthma population. Scotland has higher rates of difficult and severe asthma compared to the rest of the UK. [29]

Proxy measures of inhaled high dose corticosteroids (ICS) or number of courses of oral corticosteroids (OCS) treatments as indicators of severe asthma have been suggested. [29] Figure 7 below outlines the differences in difficult or severe asthma prevalence, based on the indicators of high-dose ICS or those receiving three or more OCS courses across the nations in the UK in 2016. [29] For three or more OCS prescriptions, Scotland has the highest figure in the UK, with 4.3%, compared to the UK figure of 3.4% of the asthma population.

Figure 7: Prevalence levels of severe asthma in the UK (2016)



Early identification of at-risk patients with asthma is key to ensure prompt referral to specialists for consideration of Monoclonal antibody (mAb) therapy where appropriate. Pathways have been developed to support the identification and management of patients at risk of severe asthma. [30]

Criteria to identify patients at risk of severe asthma:

- ≥6 SABA prescriptions in previous 12 months

or

- ≥2 asthma exacerbations / OCS prescriptions in previous 12 months 1–3

or

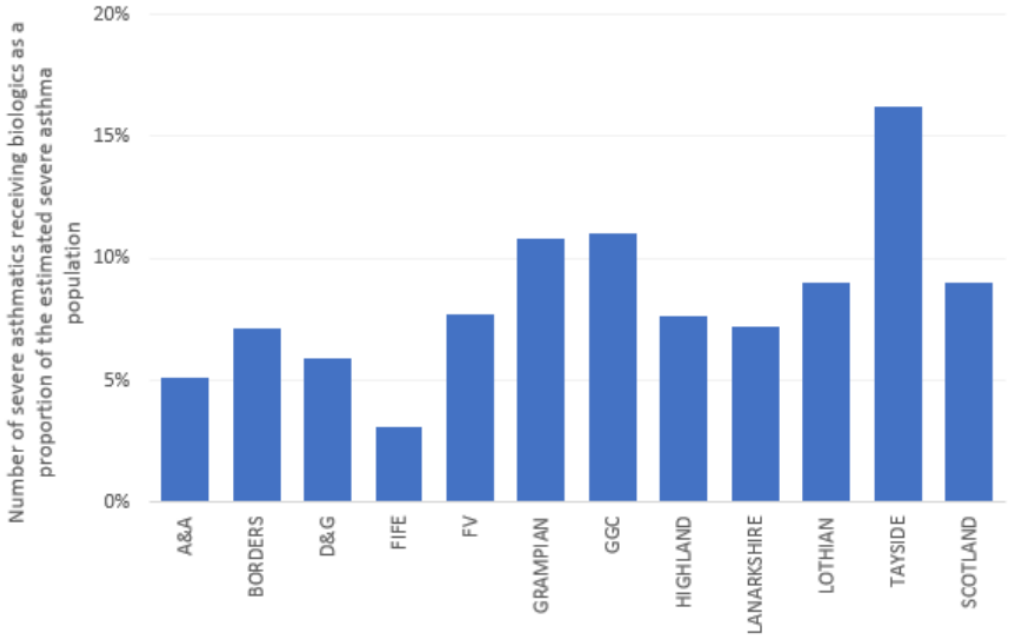
- ACQ6 >1.5 (or ACT <20) despite maximum inhaled therapies (ICS and LABA and LAMA) [28, 29]

Modifiable risk factors such as smoking status, inhaler technique, adherence and housing conditions should be addressed and a referral made where asthma control remains suboptimal [30]. Scottish Therapeutic Utility (STU) software will aid identification of these patients within GP practices.

Monoclonal antibodies (mAb) are a type of biologic drug that can be used to treat severe asthma. They target specific biological processes to reduce inflammation in the lungs and currently either target 'allergic' asthma or 'eosinophilic' asthma. There are currently four mAbs approved by the Scottish Medicine Consortium (SMC) for Scotland; omalizumab, mepolizumab, benralizumab and dupilumab. These medications have been shown to significantly reduce asthma exacerbations, hospital admissions and oral corticosteroid use. [31, 32, 33, 34] The SMC has set strict eligibility criteria for patients receiving these drugs to ensure that they are used for patients most likely to benefit and are used in the most cost-effective way. Consequently, mAbs are included in SIGN/BTS and NICE clinical guidance for the treatment of severe asthma. [12, 35]

It has been previously estimated that 20% of eligible patients with severe asthma, received treatment with mABs in the UK. [29] The Accelerated Access Collaborative estimated this as 17-21% of eligible patients in England. [36] A benchmarking exercise was completed across NHS Scotland identifying adult patient numbers prescribed mAbs as a proportion of the estimated severe asthma population (shown in chart 8) showing wide variation in prescribing based on weighted population. A prevalence of 6.4% was assumed for asthma, based on the Scottish Public Health Observatory figures, and severe asthma estimated as 4% of this. Uptake and use of mAbs for the management of severe asthma varies across Scotland. Ongoing work is required to increase early identification, referral and assessment of at-risk patients.

Chart 8: Number of people with severe asthma receiving biologics as a proportion of the estimated severe asthma population



Environmental considerations in severe asthma

A report published by the Sustainable Health care coalition [37] estimated that the greenhouse gas (GHG) emissions associated with a person's management of severe asthma is reduced by approximately 50% through the use of mAb therapy.

This reduction is due to the combined effects of improved symptom control, reduced exacerbations and a decrease in hospital admissions. These trends directly affect the environmental impact associated with asthma management and are important steps towards more sustainable treatment.

Asthma case study

Case summary – Asthma

Background Details - (Age, Sex, Occupation, baseline function)

- 47-year-old female
- Works as cleaner in local high school, but currently off sick
- Has had 16 courses oral prednisolone therapy in 12 months without any face-to-face review with any clinician. Ordered 24 salbutamol pMDIs in 12 months
- Breathless, nocturnal wheeze most nights
- Never tested positive for Covid

History of presentation/ reason for review

Referred to Respiratory Clinical Nurse Specialist due to OCS use and high-volume ordering salbutamol despite current treatment with Airflusal® pMDI 250/25 Two puffs twice daily. Worsening symptoms past year.
Multiple courses of oral prednisolone therapy

Current Medical History and Relevant Co Morbidities

Asthma

Current Medication and drug allergies (include OTC preparation and Herbal remedies)

- Airflusal® pMDI 250/25 two puffs twice daily, only ordered six inhalers in 12 months
- Salbutamol pMDI two puffs, as required, 24 inhalers ordered in 12 months

Lifestyle and Current Function (inc. Frailty score for >65yrs) alcohol/ smoking/ diet/ exercise

Lives with husband and three children. Has two dogs, one cat.
Current smoker, 10 cigarettes per day with 18 pack years
Overweight with BMI 31.
Little motivation to engage with physical activity.

Results e.g. biochemistry, other relevant investigations or monitoring

Asthma Control Test (ACT) 7/25
RadioAllergosorbent Test (RAST) – High positive dogs, moderate positive cats, low positive pollen, dust mite. Await Total IgE and aspergillus serology.
Normal eosinophils. TFTs, FBC, Us and Es, Bone, Glucose, ANA, ANCA, CRP, Iron studies and B12- normal.
Referred Chest X-Ray (CXR) and Pulmonary function tests (PFTs)

Most recent consultations

First consultation: discussed symptoms and did ACT which was 7/25. Carried out full asthma serology screen. Referred for full PFTs, CXR and DEXA scan
Chest exam-NAD. SpO2 98% room air.
Discussed concerns over multiple prednisolone courses, high volume salbutamol use and poor adherence to Airflusal® looking at the prescribing in the context of symptoms and ACT score, discussed adherence to preventer therapy.
Agreed move to Fobumix® Easyhaler® DPI 320 two puffs twice daily and Easyhaler® salbutamol as inhaler technique poor with MDI and good with Easyhaler® and also discussed this in line with health board's green agenda.
Discussed physiology of asthma and concerns as identified at risk.
Explained side effect risks from prednisolone and need for DEXA.
Discussed smoking cessation and Very Brief Advice (VBA) given. Will consider referral to Quit Your Way.
Full asthma screen and review following week.
Follow up appointment:
Given blood results and explained awaiting Total IgE and Aspergillus serology.
Discussed addition of Montelukast given RAST positivity and pets. Agreed.
Await date for PFTs and CXR
Further education and discussion around managing asthma.
Aware dependent on full results may refer onto Difficult Asthma Clinic
Personalised Asthma Action Plan discussed and agreed and written copy issued.
Advised that this may change dependent on results
Further appointment made for four weeks

Step	Process	Person specific issues to address
1. **Aims** What matters to the individual about their condition(s)?	**Review diagnoses and identify therapeutic objectives with respect to:** • Identify objectives of drug therapy • Management of existing health problems. • Prevention of future health issues	• Worsening symptoms of asthma and poor control, resulting in multiple courses of oral steroids and high volume of salbutamol use • Getting back to work as a cleaner
2. **Need** Identify essential drug therapy	**Identify essential drugs (not to be stopped without specialist advice)** • Drugs that have essential replacement functions (e.g. levothyroxine) • Drugs to prevent rapid symptomatic decline (e.g. drugs for Parkinson's disease, heart failure)	• Inhaled corticosteroids for asthma control, currently prescribed as a combination MDI, Airflusal® (not being ordered regularly)
3. **Need** Does the individual take unnecessary drug therapy?	**Identify and review the (continued) need for drugs** • What is medication for? • with temporary indications • with higher than usual maintenance doses • with limited benefit/evidence of its use in general • with limited benefit in the person under review (see Drug efficacy & applicability (NNT) table)	• Salbutamol is used frequently (24 inhalers ordered in 12 months), which would be unnecessary if preventer therapy used effectively • Past frequent courses of oral steroids (16 courses in 12 months) which increases potential for adverse effects
4. **Effectiveness** Are therapeutic objectives being achieved?	**Identify the need for adding/intensifying drug therapy in order to achieve therapeutic objectives** • to achieve symptom control • to achieve biochemical/clinical targets • to prevent disease progression/exacerbation • is there a more appropriate medication that would help achieve goals	• Discussion and education regarding adherence to preventer therapy and salbutamol use • Checked inhaler technique with MDI to ensure able to use • Inhaler changed to a DPI (Fobumix® Easyhaler®, containing an ICS/LABA) as MDI technique was poor • RAST positivity and presence of pets at home, therefore addition of montelukast to trial

5. **Safety** Does the individual have ADR/ Side effects or is at risk of ADRs/ side effects? Does the person know what to do if they're ill?	**Identify individual safety risks by checking for** • If the targets set for the individual appropriate? • drug-disease interactions • drug-drug interactions (see ADR table) • monitoring mechanisms for high-risk drugs • risk of accidental overdosing **Identify adverse drug effects by checking for** • specific symptoms/laboratory markers (e.g. hypokalaemia) • cumulative adverse drug effects (see ADR table) • drugs that may be used to treat side effects caused by other drugs **Medication Sick Day guidance**	• Advised regarding potential for adverse effects from multiple oral steroid courses. DEXA scan arranged. Inhaled corticosteroids treat the condition with reduced exposure to systemic effects, therefore reduced ADRs • Risk of hypokalaemia with salbutamol over-use, Us and Es were normal • Personalised Asthma Action Plan reinforces advice to take when symptoms of asthma control deteriorate
6. **Sustainability** Is drug therapy cost-effective and environmentally sustainable?	**Identify unnecessarily costly drug therapy by** • Consider more cost-effective alternatives (but balance against effectiveness, safety, convenience) **Consider the environmental impact** • Inhaler use • Single use plastics • Medicines waste • Water pollution	• MDI changed to DPI (Easyhaler®) due to inhaler technique, and discussed environmental impact of propellant gases in MDI compared to DPI • Salbutamol DPI (Easyhaler®) has a dose counter, so will provide reassurance of medication availability, but with education and discussion about management of asthma to reinforce the importance of regular preventer therapy
7. **Person-centredness** Is the person willing and able to take drug therapy as intended?	**Does the person understand the outcomes of the review?** • Consider Teach back **Ensure drug therapy changes are tailored to individual's preferences by** • Is the medication in a form they can take? • Is the dosing schedule convenient?	**Agreed plan** • Regular preventer therapy issued in an inhaler which they are able to use correctly • Personalised Asthma Action Plan discussed and agreed, with a written copy given • Discussed smoking cessation and Very Brief Advice (VBA) given. Considering referral to Quit Your Way

	• Consider what assistance they might have and when this is available • Are they able to take medicines as intended **Agree and communicate plan** • Discuss with the individual/carer/welfare proxy therapeutic objectives and treatment priorities • Agree with them what medicines have an effect of sufficient magnitude to consider continuation or discontinuation • Inform relevant healthcare and social care carers, changes in treatments across the care interfaces	• Possible that a further referral to the Difficult Asthma Clinic may be needed, dependent on full results and outcomes from improved education and inhaler technique • Review appointment made in 4 weeks

6. Chronic Obstructive Pulmonary Disease (COPD)

COPD

An estimated 1.2 million people live with diagnosed COPD in the UK, and the prevalence of COPD in Scotland is higher than the UK national average. [38] COPD is a disease of breathlessness, more common in those aged over 35 and in those with a risk factor, most commonly smoking or a history of smoking. [39] It is a major cause of morbidity and mortality and many people suffer for years from the burden of the disease, which is set to increase in prevalence due to ageing and continued exposure to risk factors. [40]

Summary of recommendations in COPD

- inhaled ICS are prescribed for people with COPD who have a severe exacerbation or more than 2 exacerbations in one year or if there are asthmatic features. Review patients three months following initiation of inhaled ICS and stop if there is insufficient response or if there are adverse effects
- mucolytic therapy is considered for symptoms of chronic cough with productive sputum and should be reviewed four weeks after commencing therapy, stopping if symptoms have not improved with use
- regular review of mucolytic therapy during the annual COPD review should be undertaken and may be stopped if there is no productive cough
- review individuals with COPD on separate LAMA and LABA / ICS inhalers and, if appropriate change to triple therapy inhalers - review antibiotic course length (five-day course recommended) if needed for infective exacerbations of COPD, with sputum cultures for treatment failure

Principles of prescribing for COPD

Removal or reduction of risk factors, such as stopping smoking is the first step to management of COPD. Inhaled therapy aims to relieve the symptoms of breathlessness in COPD. Pharmacotherapy can reduce COPD symptoms, reduce the frequency and severity of exacerbations and improve health and exercise tolerance. [40] Patients with COPD should be reviewed regularly to ensure that treatment is optimised.

Inhaler device selection is important and patients should receive training in how to use the device and be able to use it. Sufficient inspiratory flow is needed for a dry powder inhaler (DPI) and if an individual can breathe in quickly and deeply over two to three seconds, they are likely to be able to manage a DPI. Those who are frail, elderly or the very young are less likely to have sufficient inspiratory flow and an MDI with spacer may be more appropriate. Environmental impact of inhalers is a key consideration and prescribers are asked to consider inhalers with a lower global warming potential where it is appropriate for the patient (see chapter 10).

To prescribe most effectively for individuals with COPD the ‘what matters to you?’ principles and the Polypharmacy 7-Steps approach are recommended. Table 2 outlines the main principle for treating patients with COPD.

Table 2: Principles of treating patients with COPD

	Polypharmacy review 7-Steps	
1	What matters to the patient?	• Ask the patient what matters to them? • Is the patient's day to day life or activities affected? • Do they have relief of symptoms and would they like to consider prevention of deterioration or repeat attacks. • Clear guidance and advice on when to use rescue medication – this may involve the use of digital technology (e.g. COPD self-management app) • How to improve activity and exercise tolerance and the introduction of pulmonary rehabilitation to improve quality of life at the appropriate point. Advice regarding pacing and lifestyle • Knowledge of and avoidance of known triggers for exacerbations, for example, infection. • Do environmental considerations matter? (see chapter 10)
2	Identify essential drug therapy	• Ensure COPD diagnosis confirmed by spirometry carried out by trained professionals • Check adherence and inhaler technique before stepping up or adding medicines • Ensure treatment is optimised with local / GOLD guidelines [40] • When considering therapy, note when patients may have COPD with a background of asthma • Acute COPD exacerbations, defined as a sustained worsening of respiratory symptoms with acute onset, from their usual stable state beyond normal day-to-day variations, usually triggered by a respiratory tract infection. Initial treatment is with SABA. Consider the use of oral corticosteroids (OCS) with the possibility of antibiotics if indicated, for five days following the local formulary and personalised self-management plan [41] ◦ Indication for antibiotics (three of the following symptoms, or change in sputum colour plus one symptom) [40] ▪ worsening breathlessness and ▪ cough ▪ increased sputum production ▪ change in sputum colour. • For regular exacerbations, consider referral to secondary care where recommended antibiotic prophylaxis may be prescribed, referring to local

		formularies for guidance. Consider risk-benefit due to increased bacterial resistance. [40] ▪ Monitoring during antibiotic therapy may be required [39] ▪ [42] • Secondary care review to confirm ongoing need for and effectiveness of medication and screen for side effects
3	Does the patient take unnecessary drug therapy?	• Review use of ICS therapy in people with COPD who are not exacerbating to reduce the risk of pneumonia [40] • Long term OCS are not recommended due to the potential for adverse effects • Steroid treatment cards should be provided to patients on high dose steroids (both oral and inhaled). A steroid emergency card may also be required. A national review will establish how to identify patients utilising Scottish Therapeutics Utility following the HIS guidance HIS Steroid Emergency Card [13] • Ordering six or more SABA inhalers per year may indicate continued breathlessness and therapy optimisation needed • Repeated use of 'rescue medication' (two or more per year) [40] should trigger a review to optimise long term management. Sputum samples are necessary to guide antibiotic prescribing, especially if empirical prescribing has not resolved symptoms. [40] • Review the need for mucolytics on a regular basis. • Regular use of nebuliser therapy should be a prompt for review. Nebulisers should only be used under medical recommendation. They require regular servicing and a pMDI with a spacer is at least as good as a nebuliser in treating mild / moderate asthma attacks. [12] • If oxygen saturations are below 92% on air consistently, refer for oxygen assessment as per local Health Board criteria • Patients with significant emphysema and air trapping may benefit from lung volume reduction surgery
4	Are therapeutic objectives being achieved?	• Can the patient use their inhalers properly? • Improvement in general health and exercise tolerance • Reduction in breathlessness and reduction of the risk of exacerbations or hospital admissions • Use COPD Assessment Test (CAT) [43] and/or Modified Medical Research Council (MRC) breathlessness

		scales [44] score as objective measurement of effect on activities of daily living (ADLs) • Optimise therapy if there are frequent exacerbations and update self-management plans. • Carry out annual reviews • Manage co-morbidities affecting management and symptoms of COPD e.g., depression, heart failure, osteoporosis, obesity, anxiety and dysfunctional breathing • Vaccinations should be offered if not up to date (influenza, pneumococcal, DTaP (if not vaccinated in adolescence) and Covid-19) • Patients should be encouraged to engage in appropriate physical activity, including pulmonary rehabilitation. Social prescribing such as exercise dependant on ability, singing classes • Smoking cessation should be advised and the adverse effects of smoking on children highlighted. Offer appropriate support. Signpost patients to the NHS inform Quit Your Way Scotland website (which includes community pharmacy services) Weight reduction is recommended in obese patients (BMI >30) • Nutritional advice and support will be necessary in those with a BMI less than 20
5	Is the patient at risk of Adverse Drug Reactions (ADR)s or suffer actual ADRs?	• Appropriate use of ICS therapy ensures reduced risk of developing pneumonia (low eosinophil counts are predictive of increased risk of pneumonia) and adrenal suppression [40] • Oral corticosteroid use should not be used routinely unless co-morbidity diagnosis requires OCS treatment. If withdrawal not possible, prescribe the lowest possible dose. Monitor for the possibility of adrenal suppression/ glucocorticoid effects and osteoporosis if on long term or frequent (more than three or four courses a year) treatment [14] • Assess for oral thrush - ensure correct technique to reduce incidence and add spacer device for pMDI if required • Dry mouth is common due to anticholinergic effects of long-acting muscarinic antagonist (LAMA) inhalers. • Antibiotic use may cause adverse effects including potential allergies and are not suitable for all COPD exacerbations. Minimal course length should be prescribed to reduce the risk of resistance. Ensure true antibiotic allergies are recorded and review accuracy of

		previous records. Scottish Antimicrobial Prescribing Group (SAPG) have a penicillin de-labelling toolkit. [45] • Yellow card reporting of true ADRs
6	Sustainability	• Triple therapy may be more cost effective compared to using separate long-acting beta agonist (LABA)/ LAMA and ICS inhalers and aids adherence as well as reducing the carbon footprint of the inhalers (single versus multiple inhaler use) • Opportunities for cost minimisation should be explored but only considered if effectiveness, safety or adherence would not be comprised • For new medicines ensure prescribing is in line with Health Board formulary recommendations
7	Is the patient willing and able to take drug therapy as intended?	• A personalised action plan is key to this approach, with focus on inhaler technique, worsening symptom advice and awareness of symptom control. • Refer to Pulmonary Rehabilitation (PR) or physiotherapist management of dysfunctional breathing, when necessary, as per local Health Board criteria. • Consider end-of-life and palliative care support. Does the patient have an Anticipatory Care Plan (ACP)? • Make patient aware of support information e.g. the My Lungs My Life website (See appendix 1) • Agree with the patient arrangements for repeat prescribing. Signpost to Medicines Care and Review (MCR) service in community pharmacy where appropriate

Prescribing areas to address for COPD.

The indicators included are priority areas of prescribing where there is variation within NHS Boards. Ensuring COPD medicines are reviewed and optimised may support the reduction of unwarranted variation. The indicators focus on ensuring quality prescribing and any recommendations made follow national clinical guidance. PIS Prescribing data cannot be separated by diagnosis however the Scottish Therapeutics Utility (STU) software enables GP practices to identify patients with Asthma or COPD (see chapter 12).

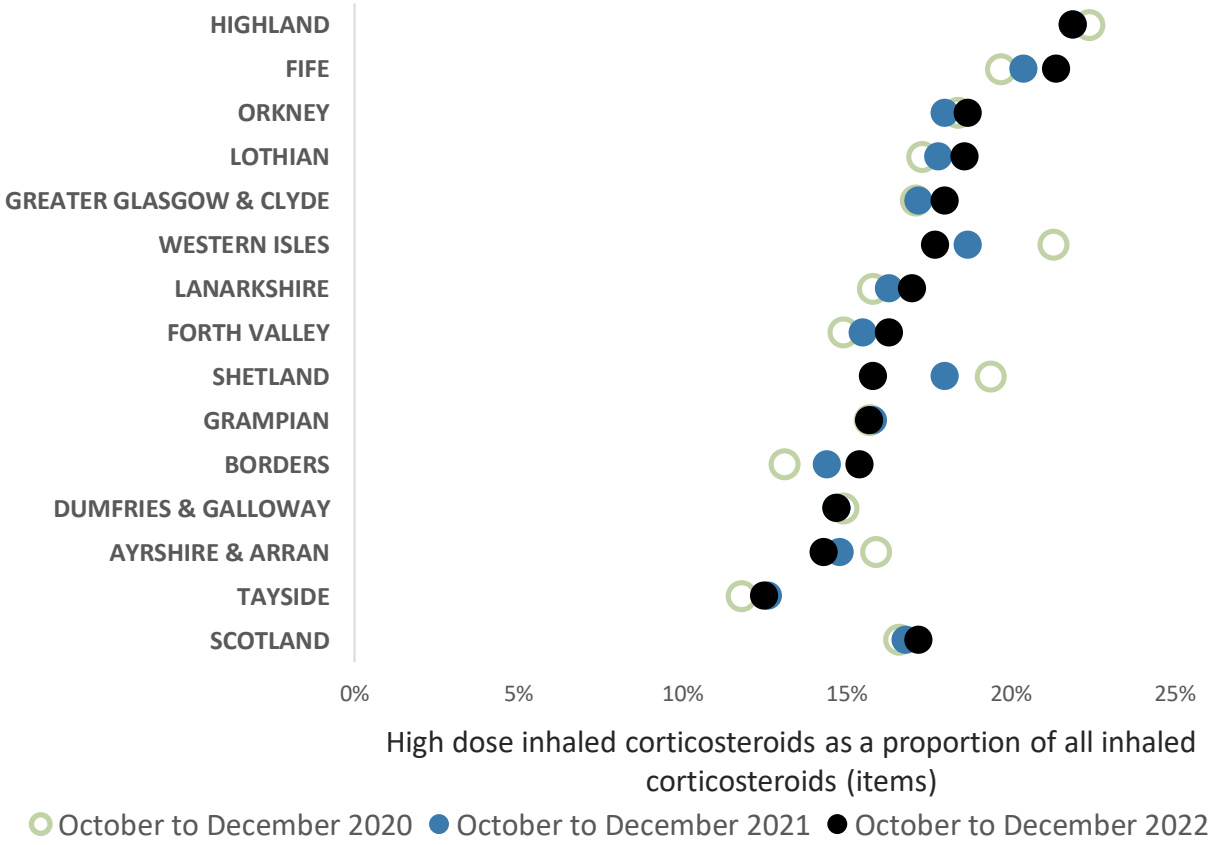
Prescribing of inhaled high dose corticosteroids

Inhaled corticosteroids place in therapy has been revised and should now only be considered after trials of SABA / LABA / LAMA. [40]

Inhaled ICS are prescribed for people with COPD who have a severe exacerbation or more than two exacerbations in one year or if there are asthmatic features or features suggesting steroid responsiveness. [40] ICS provide some benefit to patients with severe COPD, reducing exacerbations by 20-25% however there is a dose dependant risk of side effects (including pneumonia and osteoporosis). Clinical review following initiation should be undertaken after three months and ICS stopped if there is insufficient response or if there are adverse effects. A blood eosinophil count ≥300 cells/microlitre is more likely to cause relapse or exacerbations if ICS is withdrawn and needs to be monitored carefully. Refer to local guidelines to optimise treatment.

The chart below shows the variation in inhaled high dose corticosteroids between NHS Boards over the last three years. The high dose classification is based on SIGN 158.

Chart 4: High dose corticosteroid inhalers as a percentage of all corticosteroid inhalers items (using 2019 SIGN/BTS classification of high dose)



*High dose ICS prescribing used in the data corresponds to the definition of high dose steroids (both for adults and children) as per table 12 in SIGN 158.

Prescribing of Mucolytics

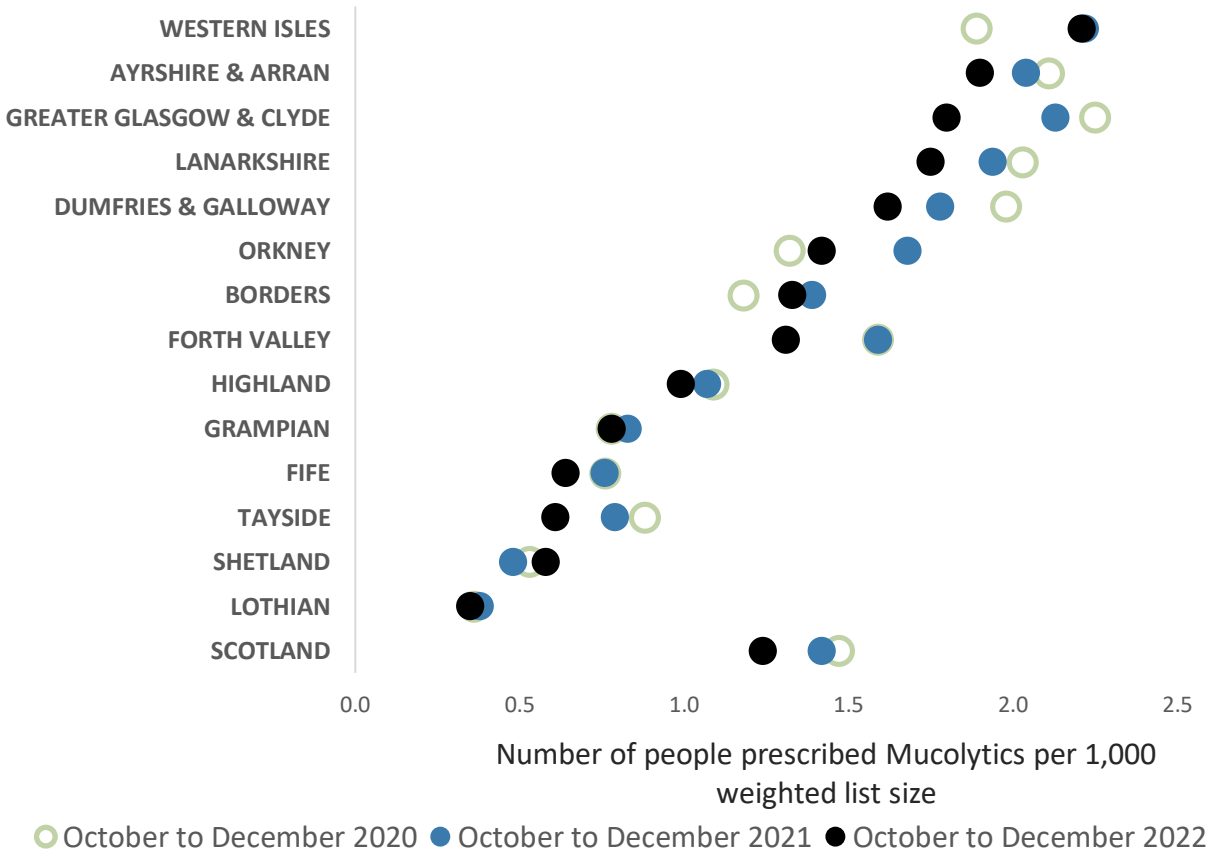
Mucolytics are taken orally to assist patients coughing up sputum, as it breaks down the protein bonds, 'loosening' the mucus. A recent Cochrane review found that use of mucolytics may reduce the likelihood of an acute exacerbation, reduced days of disability per month and possibly reduced hospital admissions with minimal adverse effects. There was doubt in the confidence of early trials reviewed in the results, due to possible risk of

bias in selection or publication, therefore the benefits of treatment may not be as great as suggested. [46] Mucolytics do not appear to affect health related quality of life or improve lung function. NICE has previously recommended that mucolytics should not be routinely prescribed to prevent exacerbations for patients with stable COPD. Mucolytic drug therapy may be considered for people with a chronic cough productive of sputum. [39]

Mucolytic therapy should be reviewed after a four-week trial and stopped if symptoms of cough and sputum production have not improved. Regular review of mucolytic therapy should be undertaken during the annual review and may be stopped if there is no productive cough or if symptoms have not improved with use. This review could be completed in primary or secondary care.

Chart 9 below shows the wide variation and increasing use of mucolytics between NHS Boards over the last three years.

Chart 9: Mucolytic Prescribing



Prescribing of Triple therapy

Triple therapy has been shown to improve lung function and patient related outcomes as well as reduce exacerbations compared with LABA alone, LABA/LAMA and LABA/ICS inhalers. Triple therapy may be suitable for patients with COPD who are experiencing exacerbations or for those with COPD with a background of asthma and still experiencing symptoms or exacerbations. Use of triple therapy inhalers should increase adherence by

patients, is cost effective and will have a reduced carbon footprint versus multiple inhalers.

Lifestyle aspects of therapy should be optimised before moving onto triple therapy. This includes smoking cessation as well as excluding other potential causes of breathlessness or poor control (adherence, inhaler technique). A clinical review after three months is recommended in order to assess benefit from the triple therapy, discontinuing the ICS if there is no improvement.[39] This review can be completed in primary or secondary care.

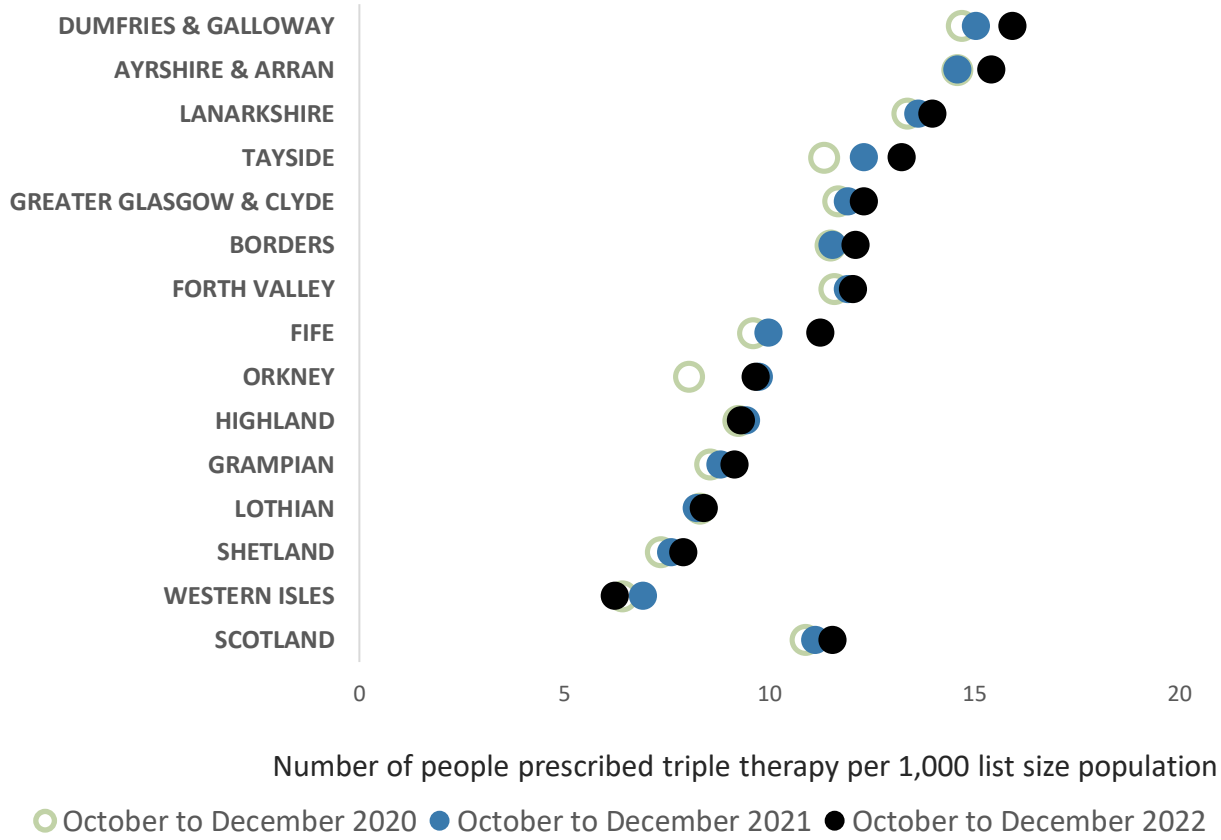
The current triple inhalers Trelegy® Ellipta®, Trimbow® (MDI and Nexthaler®), Trixeo® Aerosphere® and Enerzair®Breezhaler® have differences in licensed indication [47, 48, 49, 50, 51, 52] outlined in table 3 below. See individual Summary of Product Characteristic (SPC) for licence details. The information in table 3 was correct at the time of publication.

Table 3: Licensed indications of triple inhalers

Triple inhaler	Licensed for asthma	Licensed for COPD
Enerzair® Breezhaler® 114 micrograms /46 micrograms /136 micrograms [47]	Yes	No
Trelegy® Ellipta® 92 micrograms/55 micrograms/22 micrograms [48]	No	Yes
Trimbow® pMDI 87 micrograms/5 micrograms/9 micrograms [49]	Yes	Yes
Trimbow® 172 pMDI micrograms/5 micrograms/9 micrograms [50]	Yes	No
Trimbow® NEXThaler® 88micrograms / 5 micrograms / 9 micrograms [51]	No	Yes
Trixeo® Aerosphere® 5 micrograms / 7.2micrograms 160 micrograms [52]	No	Yes

Chart 10 below illustrates the use of triple therapy prescribing, as either separate inhalers or as a single triple inhaler, showing wide variation between NHS Boards, ranging from 15.93 in Dumfries and Galloway to 6.23 in the Western Isles. This may vary with prevalence of COPD within board regions.

Chart 10: Number of people receiving triple therapy (as single inhaler or separate inhalers)



The chart below shows the individual inhaler prescribing per Health Board which potentially could be prescribed as a combination inhaler (noting that there may not be an exact equivalent available as a triple therapy inhaler).

Chart 11: Number of people prescribed triple therapy as a single device as a proportion of all people prescribed triple therapy

Treatment of Exacerbations

A range of factors may trigger an exacerbation, for example, a viral infection or smoking. Only half of exacerbations are caused by bacterial infection.

Oral corticosteroids, at a dose of 30mg for five days, [39] should be considered for people with COPD with an exacerbation causing breathlessness which is interfering with their usual day to day activities, unless they are contraindicated.

An antibiotic may sometimes be necessary for an acute exacerbation of COPD, depending on factors such as severity of symptoms, including purulence of sputum, previous exacerbations or hospital admissions and risk of complications. Five-day courses of antibiotics are recommended as this is effective, reduces risk of resistance and minimises adverse effects.

Treatment failure with antibiotics requires a sputum culture before prescribing further antibiotics. If symptoms worsen despite antibiotic therapy, other causes must be investigated, e.g. pneumonia. [41]

COPD case study

Case summary – COPD
Background (Age, Sex, Occupation, baseline function)
• 51-year-old Male • Self-employed business man
History of presentation/ reason for review
Orders at least two Salbutamol pMDIs per month, therefore highlighted for a respiratory review with the practice pharmacist
Current Medical History and Relevant Co Morbidities
Salbutamol pMDI originally started about three years ago, for occasional breathlessness No confirmed respiratory diagnosis No other medical history of note No allergies No family history of respiratory conditions
Current Medication and drug allergies (include OTC preparation and Herbal remedies)
• Salbutamol pMDI, inhale two puffs when required for breathlessness
Lifestyle and Current Function (inc. Frailty score for >65yrs) alcohol/ smoking/ diet/ exercise
Smokes 20 a day including regular cannabis use Drinks alcohol on a regular basis, at least six units a day (shares a bottle of wine with his partner most days) Sedentary lifestyle, 'No time to exercise' due to pressures of work
"What matters to me" (Patient Ideas, Concerns and Expectations of treatment)
Wants to improve his symptoms of breathlessness and does not see the problem with use of frequent salbutamol Patient acknowledges stress of job and smokes to relieve this, clearly states that he cannot stop
Results e.g biochemistry, other relevant investigations or monitoring
Spirometry reversibility testing confirmed diagnosis of COPD (FEV_1/FVC ratio 66) Sats on air 97% BMI 28
Most recent relevant consultations
• Commenced regular long-acting bronchodilator therapy, tiotropium in a soft mist inhaler (Respimat®), demonstrating inhaler technique and explaining the need to order refills every month and to replace the device every six months, for environmental reasons. • In addition, offered the option to change to a salbutamol DPI for environmental reasons as well as the presence of a dose counter. Checked inhaler technique, and changed to Easyhaler® Salbutamol®.

- Organized influenza and pneumococcal vaccination
- Encouraged to stop smoking. The patient was not keen to do this at the present time due to ongoing stress at work, but acknowledged the need to think about this. Signposted to the Stop smoking service at the local community pharmacy for the time he is ready to quit. In the meantime, advised to reduce amount smoked, particularly with relation to the cannabis.
- Discussed stress management strategies including making time for some cycling and swimming which he was keen to do. Acknowledges that he needs to make time to do this. Also highlighted problem alcohol drinking and advice to have two alcohol free days at least.
- Issued with a COPD management plan so that symptoms of exacerbations were clear and actions to follow in that case were explained.

Step	Process	Person specific issues to address
1. **Aims** What matters to the individual about their condition(s)?	**Review diagnoses and identify therapeutic objectives with respect to:** • Identify objectives of drug therapy • Management of existing health problems • Prevention of future health issues	• No confirmed respiratory diagnosis • Would like to improve symptoms of breathlessness • High volume of salbutamol use (which he does not see a problem with) • Stressful job, smokes as relief
2. **Need** Identify essential drug therapy	**Identify essential drugs (not to be stopped without specialist advice)** • Drugs that have essential replacement functions (e.g. levothyroxine) • Drugs to prevent rapid symptomatic decline (e.g. drugs for Parkinson's disease, heart failure)	• None
3. **Need** Does the individual take unnecessary drug therapy?	**Identify and review the (continued) need for drugs** • What is medication for? • with temporary indications • with higher than usual maintenance doses • with limited benefit/evidence of its use in general • with limited benefit in the person under review (see Drug efficacy & applicability (NNT) table)	• Salbutamol is used frequently (Two salbutamol MDIs ordered every month) originally prescribed for occasional breathlessness three years ago
4. **Effectiveness**	**Identify the need for adding/intensifying drug therapy in order to achieve therapeutic objectives**	• Spirometry performed to establish diagnosis, confirmed as COPD • Add long-acting bronchodilator therapy,

Are therapeutic objectives being achieved?	• to achieve symptom control • to achieve biochemical/clinical targets • to prevent disease progression/exacerbation • is there a more appropriate medication that would help achieve goals	checking inhaler technique to ensure able to use, tiotropium Respimat® • Influenza and pneumococcal vaccinations organised
5. **Safety** Does the individual have ADR/ Side effects or is at risk of ADRs/ side effects? Does the person know what to do if they're ill?	**Identify individual safety risks by checking for** • If the targets set for the individual appropriate? • drug-disease interactions • drug-drug interactions (see ADR table) • monitoring mechanisms for high-risk drugs • risk of accidental overdosing **Identify adverse drug effects by checking for** ➢ specific symptoms/laboratory markers (e.g. hypokalaemia) ➢ cumulative adverse drug effects (see ADR table) ➢ drugs that may be used to treat side effects caused by other drugs **Medication Sick Day guidance**	• Risk of hypokalaemia with salbutamol over-use • Personalised COPD management plan reinforces advice to take when symptoms of COPD deteriorate
6. **Sustainability** Is drug therapy cost-effective and environmentally sustainable?	**Identify unnecessarily costly drug therapy by** • Consider more cost-effective alternatives (but balance against effectiveness, safety, convenience) **Consider the environmental impact** • Inhaler use	• Tiotropium Respimat has a refill which can be issued every month, only needing to replace the inhaler device every six months which has a lower environmental impact • Salbutamol MDI changed to DPI (Easyhaler®) due to inhaler technique, and

	• Single use plastics • Medicines waste • Water pollution	discussed environmental impact of propellant gases in MDI compared to DPI • Salbutamol DPI (Easyhaler®) has a dose counter, so will provide reassurance of medication availability, however long-acting bronchodilator should provide better symptom control
7. Person-centredness Is the person willing and able to take drug therapy as intended?	**Does the person understand the outcomes of the review?** • Consider Teach back **Ensure drug therapy changes are tailored to individual's preferences by** • Is the medication in a form they can take? • Is the dosing schedule convenient? • Consider what assistance they might have and when this is available • Are they able to take medicines as intended **Agree and communicate plan** • Discuss with the individual/carer/welfare proxy therapeutic objectives and treatment priorities • Agree with them what medicines have an effect of sufficient magnitude to consider continuation or discontinuation • Inform relevant healthcare and social care carers, changes in treatments across the care interfaces	**Agreed plan** • Regular long-acting bronchodilator inhaled therapy to improve symptom control • Personalised COPD management plan discussed and agreed, with a written copy given • Discussed smoking cessation but as not keen to do this at present, encouraged to reduce and in particular reduce cannabis use. • Stress management strategies and alcohol advice discussed

7. Bronchiectasis, Persistent Bacterial Bronchitis and Chronic Bronchial Sepsis

Bronchiectasis

Repeated lower respiratory tract infections can be caused by a range of clinical conditions. Bronchiectasis is characterised by the radiological finding of dilated, non-tapering bronchi with thickened walls on a high-resolution Computerised Tomography (CT) scan of the thorax. The associated clinical syndrome is characterised by frequent, usually daily, sputum production and repeated lower respiratory tract infections. It has become evident, however, that the clinical syndrome can be present in the absence of the characteristic CT findings – this clinical syndrome has become known, variably, as Persistent Bacterial Bronchitis, Chronic Bronchial Sepsis, and Bronchiectasis with a normal CT scan.

Severity of radiological bronchiectasis does not correlate well with the severity of symptoms, and a holistic approach should be taken with assessment of bronchiectasis severity, with a number of validated scoring systems available e.g. The Bronchiectasis Severity Score. [53] Guidance for referral to secondary care can be found in the BTS Guideline for Bronchiectasis in Adults. [54]

Summary of recommendations in bronchiectasis

- antibiotic choice should be directed by previous positive cultures - in the absence of previous positive sputum cultures, broad spectrum oral antibiotics to cover common respiratory pathogens are recommended, using local formulary guidance if available
- azithromycin 250mg three times a week is recommended for patients with four or more exacerbations in any 12-month period, usually started after advice from secondary care
- recommend six-month review of effectiveness of mucolytics

Principles of prescribing for Bronchiectasis

There are no licenced treatments for bronchiectasis, other than antibiotics for acute bacterial exacerbations.

There is a growing body of high-quality research for long term treatments for bronchiectasis; recent guidelines from national and international respiratory societies offer evidence-based recommendations for clinicians. [54,55]

Airway adjuncts should be considered, with appropriate instruction from a suitably trained physiotherapist or Allied Healthcare Professional (AHP).

Prescribing issues to address

Acute exacerbations

Oral antibiotic therapy should be guided by sputum cultures. Antibiotic choice should not be delayed while culture results are awaited – the choice should be directed by previous positive cultures. In the absence of previous positive sputum cultures, broad spectrum oral antibiotics to cover common respiratory pathogens are recommended, using local formulary guidance if available. The recommended duration is 14 days.

- 1st line - amoxicillin 1g three times a day
- 2nd line - doxycycline 100mg twice a day
- 3rd line - co-trimoxazole 960mg twice a day

A first positive culture for Pseudomonas aeruginosa in sputum should trigger a discussion with local bronchiectasis specialists to consider eradication therapy in the form of high dose ciprofloxacin and nebulised antibiotics (usually colomycin).

Long term antibiotics

Azithromycin 250mg three times a week is recommended for patients with four or more exacerbations in any 12-month period, usually started in secondary care. It has the most evidence base. Patients should be made aware of the potential adverse effects:

- tinnitus and hearing loss (which can be reversed if treatment is stopped early)
- prolongation of QTc interval and consequent increased risk of ventricular tachycardia
- anti-microbial resistance

Prior to commencing azithromycin, a mycobacterial culture of at least six weeks should be negative. An ECG should be performed to ensure a normal QTc and a medication check should be carried out to consider interactions, particularly with other medications that may prolong the QTc interval. Liver function tests with six monthly monitoring is recommended.

Azithromycin should be continued during exacerbations requiring antibiotics, except when receiving quinolone antibiotics (ciprofloxacin, levofloxacin, moxifloxacin) in which case the azithromycin should be stopped due to risk of QTc prolongation. Azithromycin is less beneficial in active smokers. [40]

Clarithromycin 250mg daily can be used as an alternative macrolide for long term prophylaxis of exacerbations.

Doxycycline 100mg daily can be used as an alternative in patients who cannot tolerate, or are not suitable for, long term macrolide therapy.

Bronchodilator Therapy
Breathlessness is multifactorial in bronchiectasis. A trial of combination bronchodilator containing a long-acting beta-agonist (LABA) and long-acting muscarinic antagonist (LAMA) can be considered, particularly if the patient has co-existent COPD. The choice of LABA/LAMA should be based on the inhaler technique of the patient, local and national prescribing guidance.

Inhaled and Oral Corticosteroids
Oral steroids should be avoided in patients with bronchiectasis, unless there is a clear indication for an alternative co-morbidity, such as asthma.

Although there is evidence for benefit of inhaled corticosteroids (ICS) for patients with COPD and elevated eosinophil counts, studies in bronchiectasis with eosinophilia are yet to report. Patients with concomitant COPD and bronchiectasis should receive ICS in line with current COPD guidance. Patients with isolated bronchiectasis and an eosinophilia may benefit from a trial of ICS. Advice from a bronchiectasis expert is strongly recommended.

Nebulised Saline
Nebulised saline is recommended for sputum clearance in bronchiectasis. Available concentrations are 0.9% (“Normal” saline), and 3%, 6%, 7% (hypertonic saline).

There is currently no evidence to recommend any concentration of saline over any other, though side effects may limit the higher concentrations in use. The dosing schedule is four ml of saline nebulised two to four times per day.

Oral Mucolytics
There is currently no high-quality evidence base for oral mucolytic therapy in people with bronchiectasis, however carbocisteine and Acetylcysteine are widely used in Scotland to improve sputum clearance. Acetylcysteine has once daily dosing which may assist with adherence to therapy. A six-month review of effectiveness is strongly recommended if either is trialled in any patient. If a mucolytic is started in secondary care it can be reviewed in either primary or secondary care for effectiveness. See chart 8 for prescribing of mucolytics in Health Boards.

Acetylcysteine should not be given at the same time of day as antibiotic therapy as it potentially reduces antibiotic absorption.

Fungal infection

Fungal infection can occur in advanced bronchiectasis. Cultures for fungal infection, and serology for aspergillus, should be sought in cases of severe bronchiectasis refractory to other treatment. Results suggestive of the presence of fungal infection warrant immediate discussion with a bronchiectasis and/or fungal infection specialist. Antifungal treatment for aspergillus disease should be co-ordinated through a dedicated multidisciplinary team.

To prescribe most effectively for individuals with Bronchiectasis the 'what matters to you?' principles and the Polypharmacy 7-Steps approach are recommended. Table 4 outlines the main principle for treating patients with bronchiectasis.

Table 4: Principles of treating patients with Bronchiectasis

	Polypharmacy review 7-Steps	Bronchiectasis

1	What matters to the patient?	• Ask the patient what matters to them?
		  o chronic sputum production
		  o frequency of exacerbations
		  o breathlessness
		  o cough
		• How does the condition affect patients' day to day life / activities
		• Side effects of medicines versus benefit
		• Patient's awareness of the reason for taking medications
		  o antibiotics for exacerbations
		  o preventative treatments
		  o inhaled therapies
		  o mucolytics
		• A holistic Polypharmacy 7-Steps approach is recommended to ensure treatment is optimised giving consideration to co-morbidity
		• Patient awareness of side effect profiles of medicines
		• Pulmonary Rehabilitation (PR)
		• Discuss sputum cultures, including annual nontuberculous mycobacterial (NTM) cultures
		• Do environmental considerations matter? (see chapter 10)

2	Identify essential drug therapy	• Confirm ongoing need for and effectiveness of medication and screen for side effects o all patients on long term macrolide should have assessment of hearing/tinnitus • Often patients may not be aware that side effects are related to drugs • Discuss pro – cons of side effects against benefit of therapy

		• Ensure therapy is optimised with no drug interactions
3	Does the patient take unnecessary drug therapy?	• Assess adherence and ensure patient understands treatment regime • Is there evidence of benefit from taking the treatment, e.g. reassuring physiology, maintaining exercise tolerance • Assess the benefit of mucolytic therapy – is it warranted?
4	Are therapeutic objectives being achieved?	• Frequency of infective exacerbations o is there a role for long term antibiotic therapy? • Ensure regular monitoring of physiology • Ensure sputum cultures are up to date • Check antibiotic course duration is appropriate • Vaccinations should be offered if not up to date (influenza, pneumococcal, DTaP (if not vaccinated in adolescence) and Covid-19) • Patients should be encouraged to engage in appropriate physical activity. Social prescribing such as exercise dependant on ability, singing classes • Smoking cessation should be advised and the adverse effects of smoking on children highlighted. Offer appropriate support. Signpost patients to the NHS inform Quit Your Way Scotland website (which includes community pharmacy services) • Weight reduction is recommended in obese patients (BMI >30) • Nutritional advice and support will be necessary in those with a BMI less than 20
5	Does the patient have ADR/ side effect or is at risk of side effects?	• Ensure regular drug monitoring as per local protocol • Review potential drug interactions which can potentiate side effects • Discuss side effect profile with perceived benefit of treatment • Confirm antibiotic allergy/side effect profile o Consider referral for penicillin allergy de-labelling [45] if available locally • Yellow card reporting of true ADRs
6	Sustainability	• Ensure drugs are either within current guidelines or have been discussed at a specialist multidisciplinary team meeting
	Is the patient willing and able to take drug therapy as intended?	• Are at-home antibiotics appropriate for the patient to enable self-management? • Make patient aware of support information • Non-attenders should be followed up – alternative strategies to encourage engagement may be required,

7		(e.g. through community pharmacy / Near Me / telehealth acknowledging limitations • Agree with the patient arrangements for repeat prescribing. Signpost to Medicines Care and Review (MCR) service in community pharmacy

Bronchiectasis Case Study

Case summary – Bronchiectasis
Background Details - (Age, Sex, Occupation, baseline function)
• 58-year-old female • Works as a secondary school teacher • Still working full time
History of presentation/ reason for review
• Referred by GP due to productive cough, asking if she has COPD. • On presentation at clinic, has had two episodes of chest infection requiring antibiotics in last six months. On both occasions, sputum grew Haemophilus influenzae • Daily production of yellow sputum • Minimal breathlessness • No chest pains
Current Medical History and Relevant Co Morbidities
• Severe chest infection at eight years (spent three months in hospital) • Was ‘chesty’ through adulthood
Current Medication and drug allergies (include OTC preparation and Herbal remedies)
• No current medication • Had been given SABA inhaler with no benefit • No drug allergies
Lifestyle and Current Function (inc. Frailty score for >65yrs) alcohol/ smoking/ diet/ exercise
• Never smoked • Drinks alcohol on special occasions • Enjoys walking holidays
Results e.g., biochemistry, other relevant investigations or monitoring
• Localised bronchiectasis (right lower lobe), otherwise normal • No radiological evidence of NTM pulmonary disease • Spirometry is normal • Mycobacterial cultures were negative for NTM

Most recent consultations
First consultation: • Given the diagnosis of localized bronchiectasis, likely due to childhood pneumonia. No diagnosis of COPD. • Given instruction in airway clearance techniques by specialist respiratory physiotherapist. • Commenced on a mucolytic to assist sputum expectoration **Follow up 3 months:** • Significant improvement in her ability to clear sputum • Improvement of day-to-day symptoms reported • However further chest infection requiring antibiotics • Discussion regarding long term azithromycin treatment o consented to risks of reversible tinnitus / hearing loss associated with long term macrolide use o ECG carried out, showing normal QTc of 405 o advised to continue azithromycin when on other antibiotics except quinolones • Azithromycin 250mg Monday / Wednesday / Friday commenced **Follow up 6-month review:** • Patient reported no further chest infection since commencing azithromycin • Routine sputum samples continued to be negative • Repeat mycobacterial culture was negative • After discussion azithromycin has been continued long term with good effect

Steps	Process	Person specific issues to address
1. **Aims** What matters to the individual about their condition(s)?	**Review diagnoses and identify therapeutic objectives with respect to:** • Identify objectives of drug therapy • Management of existing health problems. • Prevention of future health issues	• Ongoing symptoms of productive cough, daily sputum production • Diagnosis of COPD
2. **Need** Identify essential drug therapy	**Identify essential drugs (not to be stopped without specialist advice)** • Drugs that have essential replacement functions (e.g. levothyroxine) • Drugs to prevent rapid symptomatic decline (e.g. drugs for Parkinson's disease, heart failure)	• None
3. **Need** Does the individual take unnecessary drug therapy?	**Identify and review the (continued) need for drugs** • What is medication for? • With temporary indications • With higher than usual maintenance doses • With limited benefit/evidence of its use in general • With limited benefit in the person under review (see Drug efficacy & applicability (NNT) table)	• None
4. **Effectiveness** Are therapeutic objectives being achieved?	**Identify the need for adding/intensifying drug therapy in order to achieve therapeutic objectives** • To achieve symptom control • To achieve biochemical/clinical targets • To prevent disease progression/exacerbation • Is there a more appropriate medication that would help achieve goals	• Localised bronchiectasis (right lower lobe), Normal spirometry. No diagnosis of COPD • Commenced a mucolytic to assist sputum expectoration • Airway clearance techniques taught by specialist

		respiratory physiotherapist • Long-term azithromycin therapy commenced following further antibiotic courses for chest infection
5. **Safety** Does the individual have ADR/ Side effects or is at risk of ADRs/ side effects? Does the person know what to do if they're ill?	**Identify individual safety risks by checking for** • If the targets set for the individual appropriate? • Drug-disease interactions • Drug-drug interactions (see ADR table) • monitoring mechanisms for high-risk drugs • Risk of accidental overdosing **Identify adverse drug effects by checking for** • Specific symptoms/laboratory markers (e.g. hypokalaemia) • Cumulative adverse drug effects (see ADR table) • Drugs that may be used to treat side effects caused by other drugs **Medication Sick Day guidance**	• ECG carried out prior to long-term azithromycin therapy, normal QTc of 405 • Risks explained of reversible tinnitus/hearing loss associated with long term macrolide use • If further antibiotics needed, can continue azithromycin apart from with quinolones
6. **Sustainability** Is drug therapy cost-effective and environmentally sustainable?	**Identify unnecessarily costly drug therapy by** • Consider more cost-effective alternatives (but balance against effectiveness, safety, convenience) **Consider the environmental impact** • Inhaler use • Single use plastics • Medicines waste • Water pollution	• Regular long-term azithromycin reduces need for repeated courses of short-term antibiotics and improved patient outcomes
7. **Person-centredness**	**Does the person understand the outcomes of the review?** • Consider Teach back	**Agreed plan** • Regular long-term azithromycin commenced (Monday

Is the person willing and able to take drug therapy as intended?	**Ensure drug therapy changes are tailored to individual's preferences by** • Is the medication in a form they can take? • Is the dosing schedule convenient? • Consider what assistance they might have and when this is available • Are they able to take medicines as intended **Agree and communicate plan** • Discuss with the individual/carer/welfare proxy therapeutic objectives and treatment priorities • Agree with them what medicines have an effect of sufficient magnitude to consider continuation or discontinuation • Inform relevant healthcare and social care carers, changes in treatments across the care interfaces	/Wednesday /Friday) • Sputum clearance techniques

Key concepts in this case

- Confirm diagnosis of bronchiectasis to allow appropriate management
- Sputum management with mucolytics and sputum clearance techniques
- Use of long-term azithromycin for regular exacerbations and discussion of side effects

8. Idiopathic Pulmonary Fibrosis

Idiopathic Pulmonary Fibrosis (IPF) is a progressive and often fatal condition. In a 2016 publication it was estimated that over 5,000 new IPF cases were diagnosed each year in the UK and over 30,000 people were living with the disease. [56]

Patients with this condition often have disabling symptoms of breathlessness and cough. Anti-fibrotic (AF) therapy has been shown to reduce loss of lung function and preserve life when used effectively in IPF. These medicines (pirfenidone and nintedanib) have a high side effect profile, however, and do not improve the symptoms of IPF. Nintedanib has also shown benefit for patients with other Progressive Fibrosing Interstitial Lung Diseases. Patient awareness of these issues and the risks and benefits of taking treatment is important to ensure appropriate adherence with therapy. Anti-fibrotic therapy should only be prescribed in secondary care.

For GP practices these medicines should be added to the patient record to highlight prescribing in secondary care (as an 'outside issue'). This allows interactions to be checked when prescribing for another condition.

Good patient care of people with IPF will require effective communication between secondary and primary care clinicians alongside the use of respiratory support services such as Pulmonary Rehabilitation and secondary care Respiratory Nurse Specialists where available.

End of life care can often be managed in primary care. GP practice teams should ensure that anticipatory care plans and medicines are in place when approaching end of life, to allow timely access to these when required.

Summary of recommendations in Idiopathic Pulmonary fibrosis

- anti-fibrotics prescribed only by a clinician with experience of treating IPF
- only prescribe anti-fibrotics when there is confirmed fibrotic lung disease with evidence of physiological progression

Principles of prescribing for Idiopathic Pulmonary Fibrosis in Secondary Care

There are various principles to be mindful of when prescribing nintedanib or pirfenidone for patients with IPF. These include the following:

- nintedanib and pirfenidone should only prescribed only by a clinician with experience of treating IPF and they should monitor the benefit of AF medicines
- nintedanib and pirfenidone are approved for restricted use in Scotland for patients with a predicted forced vital capacity (FVC) less than or equal to 80% [57, 58]
- the two available drugs have similar efficacy and have different side effect profiles - most patients who cannot tolerate one therapy will tolerate the other
- ensure appropriate treatment choice including drug interactions and potential side effect profile

    - nintedanib is associated with liver injury and requires blood monitoring monthly for the first three months then six monthly thereafter - common side effects include diarrhoea, nausea, abdominal pain, weight loss and decreased appetite
    - pirfenidone is associated with hepatic injury and requires blood monitoring monthly for the first six months then three monthly thereafter - common side effects include nausea, indigestion, photosensitivity and rash
- primary care clinicians should refer the patient presenting with these side effects to the consultant.
- shared care agreements are variable across Scotland, so it is important to establish who is responsible for blood monitoring

Prescribing areas to address for quality prescribing in Idiopathic Pulmonary Fibrosis

Prescribing appropriate anti-fibrotic treatment for patients with progressive Idiopathic Pulmonary Fibrosis

Anti-fibrotic therapy is difficult to tolerate with a high side effect profile. Patients should only be prescribed this treatment when there is confirmed fibrotic lung disease with evidence of physiological progression. Ideally this should have been reviewed at an IPF multi-disciplinary team meeting before initiation of therapy.

There is no conclusive evidence to support use of any medicines to increase the survival of people with IPF [59] however NICE technology appraisals for pirfenidone or nintedanib should be consulted prior to prescribing. [60, 61]

IPF therapy is currently included in the NHS Scotland Patient Access Scheme which improves the cost effectiveness of nintedanib and pirfenidone. [62]

Adopting the 'what matters to you?' principles is recommended and knowledge of co-morbidities and co-prescribing will allow an approach to incorporating the Polypharmacy 7-Steps approach to the review. Table 5 outlines the main principle for treating patients with IPF.

Table 5: Principles of treating patients with IPF

	Polypharmacy review 7-Steps	IPF
1	What matters to the patient?	• Ask the patient what matters to them? • How does the condition affect patients' day to day life / activities ○ cough interfering with ability to work • Patient awareness of the reason for taking medications- to preserve lung function with anti-fibrotic treatment • Patient awareness of side effect profiles of medicines versus benefit • Pulmonary Rehabilitation (PR) • Discuss monitoring oxygenation when mobilising
2	Identify essential drug therapy	• Assess adherence • Confirm ongoing need for and effectiveness of medication and screen for side effects • Ensure therapy is optimised with no drug interaction
3	Does the patient take unnecessary drug therapy?	• Is there evidence of benefit from taking the treatment, e.g. reassuring physiology, maintaining exercise tolerance
4	Are therapeutic objectives being achieved?	• Halted rate of decline of lung function • Ensure regular monitoring of physiology • Review oxygenation at rest and on mobilizing • Medication should be titrated to a dose which balances maximum clinical efficacy with minimal risk and stopped if found to be ineffective or if adverse effects outweigh benefits • Once the dose is stable and effectiveness has been established, ongoing recorded review should occur as clinically appropriate for the individual patient, bearing in mind that side effects can develop after established on therapy • Vaccinations should be offered if not up to date (influenza, pneumococcal, DTaP (if not vaccinated in adolescence) and Covid-19) • Can the patient use their inhaler properly? • Patients should be encouraged to engage in appropriate physical activity. Social prescribing such as exercise dependent on ability, singing classes • Smoking cessation should be advised and the adverse effects of smoking on children highlighted. Offer appropriate support. Signpost patients to the NHS inform Quit Your Way Scotland website (which includes community pharmacy services).

		• Weight reduction is recommended in obese patients (BMI >30) • Nutritional advice and support will be necessary in those with a BMI less than 20
5	Does the patient have ADR/ side effect or is at risk of side effects?	• Discuss side effect profile with perceived benefit of treatment - often patients may not be aware that side effects are related to the drug treatment • Ensure regular drug monitoring as per local protocol • Consider additional therapy to control side effects e.g. loperamide for GI upset, morphine for cough • Review potential drug interactions which can potentiate side effects • Yellow card reporting of true ADRs
6	Sustainability	• Discuss dispensing options with patient e.g. potential home delivery schemes • Ensure that drug is either within current guidelines or has been discussed at a regional IPF multidisciplinary team
7	Is the patient willing and able to take drug therapy as intended?	• A personalised action plan is key to this approach, with focus on maintain lung function, preserving quality of life • Agree with the patient arrangements for repeat prescribing. Signpost to Home care delivery arrangements / Medicines Care and Review (MCR) service in community pharmacy • Make patient aware of support information • Non-attenders should be followed up Alternative strategies to encourage engagement may be required e.g., through community pharmacy / Near Me / telehealth acknowledging limitations

Idiopathic Pulmonary Fibrosis Case Study

Case summary – Idiopathic Pulmonary Fibrosis
Background Details - (Age, Sex, Occupation, baseline function)
• Male • age 78 • MRC grade 4 Shortness of Breath
History of presentation/ reason for review
• Presented to clinic with persistent cough which impacted on his ability to work • Slow progression of condition
Current Medical History and Relevant Co Morbidities
• No previous medical history, previously fit and well
Current Medication and drug allergies (include OTC preparation and Herbal remedies)
• Struggled to tolerate therapy, with multiple side effects but treatment eventually established- had to switch from pirfenidone to nintedanib • Opiates (morphine sulfate 10mg/5ml oral solution, 2.5ml) to control cough / breathlessness due to progression • Oxygen (maintain saturation / promote mobility)
Lifestyle and Current Function (inc. Frailty score for >65yrs) alcohol/ smoking/ diet/ exercise
• Condition slowly progressed – required opiates to control breathlessness
Results e.g., biochemistry, other relevant investigations or monitoring
• Investigations confirmed IPF • Monitored at clinic - when lung function showed evidence of progression antifibrotic treatment started
Most recent consultations
• Despite progressive condition and high symptom burden he was able to maintain a reasonable quality of life, socialising, spending time with family, travelling and painting

Step	Process	Person specific issues to address
1. **Aims** What matters to the individual about their condition(s)?	**Review diagnoses and identify therapeutic objectives with respect to:** • Identify objectives of drug therapy • Management of existing health problems. • Prevention of future health issues	• Persistent cough, impacting ability to work • Slow progression of condition
2. **Need** Identify essential drug therapy	**Identify essential drugs (not to be stopped without specialist advice)** • Drugs that have essential replacement functions (e.g. levothyroxine) • Drugs to prevent rapid symptomatic decline (e.g. drugs for Parkinson's disease, heart failure)	• Nintedanib, started by specialist respiratory consultant to reduce loss of lung function
3. **Need** Does the individual take unnecessary drug therapy?	**Identify and review the (continued) need for drugs** • What is medication for? • With temporary indications • With higher than usual maintenance doses • With limited benefit/evidence of its use in general • With limited benefit in the person under review (see Drug efficacy & applicability (NNT) table)	• None
4. **Effectiveness** Are therapeutic objectives being achieved?	**Identify the need for adding/intensifying drug therapy in order to achieve therapeutic objectives** • To achieve symptom control • To achieve biochemical/clinical targets • To prevent disease progression/exacerbation • Is there a more appropriate medication that would help achieve goals	• Cough and breathlessness symptoms due to progression of IPF controlled by addition of opiates (morphine sulfate 10mg/5ml solution, 2.5ml dose) • Oxygen therapy to maintain saturation and promote mobility

5. **Safety** Does the individual have ADR/ Side effects or is at risk of ADRs/ side effects? Does the person know what to do if they're ill?	**Identify individual safety risks by checking for** • If the targets set for the individual appropriate? • Drug-disease interactions • Drug-drug interactions (see ADR table) • Monitoring mechanisms for high-risk drugs • Risk of accidental overdosing **Identify adverse drug effects by checking for** • Specific symptoms/laboratory markers (e.g. hypokalaemia) • Cumulative adverse drug effects (see ADR table) • Drugs that may be used to treat side effects caused by other drugs **Medication Sick Day guidance**	• Side effect profiles for the anti-fibrotic drugs differ and previous therapy not tolerated due to side effects. Now established on nintedanib. Side effects associated with nintedanib are liver injury, blood monitoring required • Common side effects of nintedanib are diarrhoea, nausea, abdominal pain, weight loss and decreased appetite
6. **Sustainability** Is drug therapy cost-effective and environmentally friendly	**Identify unnecessarily costly drug therapy by** • Consider more cost-effective alternatives (but balance against effectiveness, safety, convenience) **Consider the environmental impact** • Inhaler use • Single use plastics • Medicines waste • Water pollution	• Anti-fibrotic therapy is monitored and reviewed by specialist IPF teams
7. **Person-centredness** Is the person willing and able to take drug therapy as intended?	**Does the person understand the outcomes of the review?** • Consider Teach back **Ensure drug therapy changes are tailored to individual's preferences by** • Is the medication in a form they can take? • Is the dosing schedule convenient?	**Agreed plan** • Continued treatment with nintedanib • Opiate use for control of cough and breathlessness symptoms • Oxygen for mobility

- Consider what assistance they might have and when this is available
- Are they able to take medicines as intended

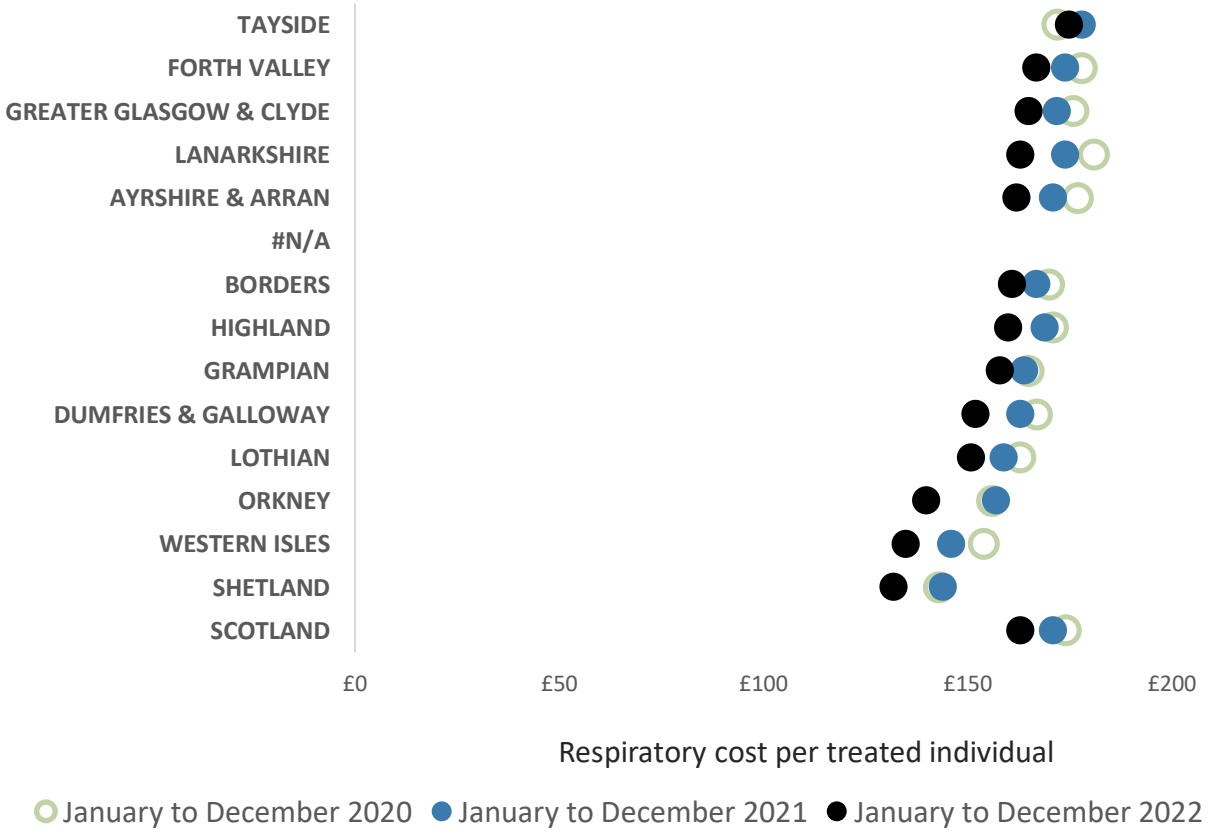
Agree and communicate plan

- Discuss with the individual/carer/welfare proxy therapeutic objectives and treatment priorities
- Agree with them what medicines have an effect of sufficient magnitude to consider continuation or discontinuation
- Inform relevant healthcare and social care carers, changes in treatments across the care interfaces

9. Respiratory Prescribing Data for NHS Health Boards

This chapter contains some top-level prescribing information comparing NHS Boards. Chart 12 below highlights the cost per treated patient which has decreased by £8.00 in NHS Scotland between 2021 and 2022.

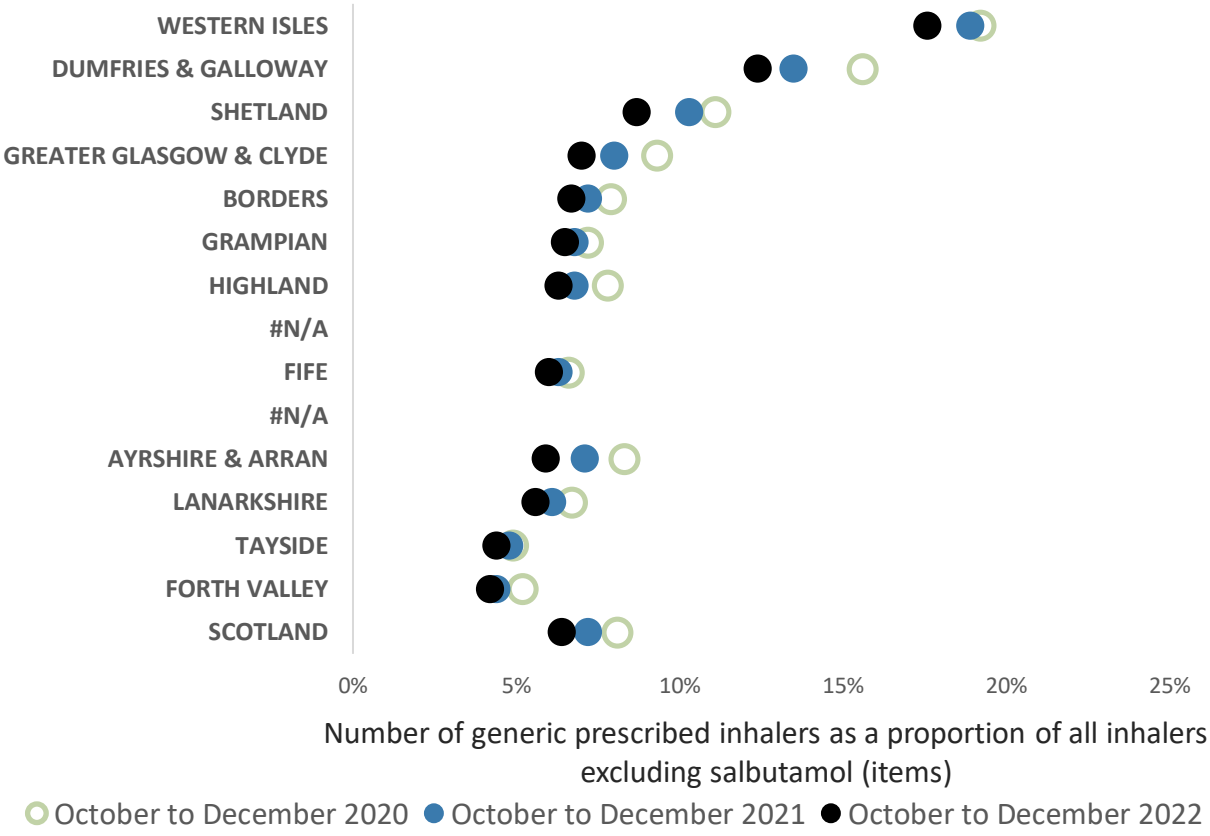
Chart 12: Respiratory Costs per treated patient



Generic Prescribing

National and local guidance promotes branded prescribing of all inhalers excluding salbutamol inhalers. This ensures that the correct inhaler device and product is given to the individual (for example, formulations of inhaled corticosteroids differ in potency). Chart 13 shows prescribing of generic inhalers across health boards, showing improvements across all boards.

Chart 13: Proportion of generically prescribed inhalers as a proportion of all inhalers (excluding salbutamol)



10. Environmental impact of inhalers

NHS Scotland has committed to be a net-zero greenhouse gas emissions organisation by 2040. [6]

It is estimated that NHS Scotland emissions due to inhaler propellant was 79,000 tonnes of carbon dioxide (CO2) equivalent in 2020/21. This is the same as 79,000 people flying from London to New York. Approximately 3% of the carbon footprint of NHS Scotland results from the use of metered dose inhalers (pMDI). [63] Salbutamol alone accounts for two thirds of the total carbon footprint from pMDIs. [21]

Summary of recommendations for environmental considerations of respiratory prescribing

Our recommendations are as follows:

- promotion of person-centred reviews to optimise disease control and ensure quality prescribing in line with national guidance
- prioritise review of patients with asthma who are over-reliant on SABA reliever inhalers as a marker of poor asthma control (see chapter 5)
- streamline devices for patients, avoiding multiple device use where possible
- Review separate inhalers where a combination inhaler device would be possible
- review individuals prescribed SABA alone, check diagnosis and if appropriate consider DPI
- update local formularies to highlight and promote inhalers with lower CO2 emissions
- use ScriptSwitch in GP Practices to promote better asthma care and environmental messages e.g.
    - highlighting SABA overuse
    - prescribe small cannister Salbutamol pMDI with lower GWP (Salamol® or Airomir®)
- raise public awareness to promote good asthma care and the environmental impact of respiratory prescribing
- utilise resources to support patients and clinicians in environmentally friendly and sustainable prescribing (see appendix 1)

For new patients:

- use inhalers with low global warming potential where they are as equally effective.
- where there is no alternative to a pMDIs, lower volume HFA 134a pMDIs should be used in preference to large volume or HFA 227ea pMDIs

For existing patients:

- switch to DPI if appropriate, following a patient review. We do not recommend a blanket switch
- consider switch to DPI inhalers for patients with asthma who are interested and:
    - have an adequate inspiratory flow (e.g. use an In-Check® device)
    - have been stable for two years
    - have had no asthma attack for two years
    - have never been admitted to hospital /ITU
    - not under secondary care review

Environmental impact of inhalers

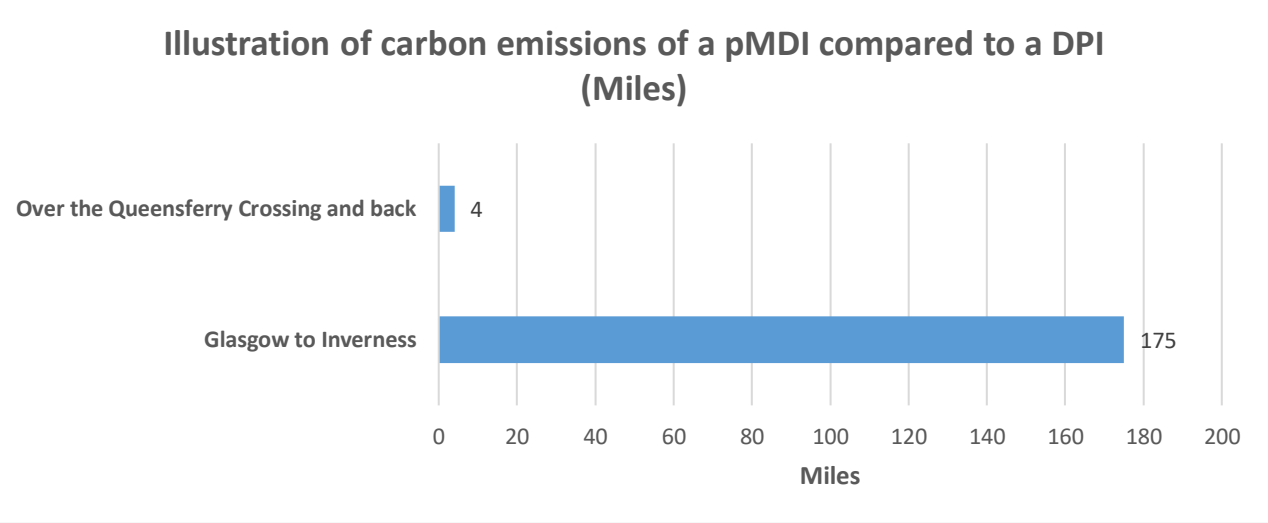
Prescribing data for the year 2020/2021 shows that in NHS Scotland 68% inhalers dispensed were pMDI and 32% were dry powder inhalers (DPI) or soft mist inhalers. The UK has a high proportion of pMDI use (70%) compared with the rest of Europe (< 50%) and Scandinavia (10–30%).[64] Figures from Scandinavia show a lower rate of deaths. [22]

Health care professionals should be aware of the differences in environmental impact and global warming potential of metered dose inhalers (pMDI), dry powder inhalers (DPI) and soft mist inhalers (SMI). The hydrofluoroalkane (HFAs) propellant gases used in pMDIs, HFA 134a and HFA 227ea, are potent greenhouse gases which are respectively 1300 and 3350 times more potent than CO2. [65] DPI inhalers have significantly less global warming potential. [66]

A UK based post-hoc analysis has demonstrated that patients can be changed from an MDI to a DPI without loss of asthma control. [67]

Figure 8 highlights the approximate difference in greenhouse gas emissions comparing a Ventolin® Evohaler® with Ventolin® Accuhaler® or salbutamol Easyhaler® and illustrates the equivalent carbon emissions from driving a car emitting 180g CO2/Km. Many people recognise the carbon emissions from driving and therefore this can be a helpful comparison.

Figure 8: Illustration of carbon emissions of a pMDI compared to a DPI



Equivalent car exhaust emissions CO2 emissions from a Ventolin Evohaler (containing 100 x 2 puff doses) and a Ventolin Accuhaler (60 x 1 puff doses) or Salbutamol Easyhaler (200 x 1 puff doses). Assumes car achieves 180g CO2/Km.

Individuals may be interested in the carbon footprint of their inhaler treatment which should be considered during review. Changes should only be made if effectiveness, safety or adherence is not compromised and this should be managed on a case-by-case basis, using a shared decision-making approach. Changes should not be made without consulting the patient - the NICE: inhalers for asthma prescribing decision aid can be a useful aid for this process. [68]

Switching inhalers from MDIs to DPIs could result in the same amount of carbon saving as planting 7 trees. (Based on 1 year of treatment in a person with good control of asthma, using no more than 3 doses of SABA per week and a regular preventer).

The most environmentally friendly inhaler is the one that the patient can, will and does use correctly

The most important factor in choosing an inhaler device is that the individual can use the inhaler properly. [12] It is essential that reviews are timely to ensure control of their condition is maximised, and inhalers are prescribed and used appropriately, checking adherence to therapy.

Poor control of asthma leads to over-reliance on reliever inhalers and Salbutamol MDI alone accounts for 66% of the total carbon footprint from inhalers. [21] Through clinician review and improved management of asthma and COPD, we can improve outcomes for patients, reduce salbutamol use and reduce carbon emissions from inhalers (see chapter 1).

Good asthma control is better for your patient and the environment

Local formularies should be updated to highlight and promote lower CO2 emission inhalers and ScriptSwitch can be used to promote environmentally friendly prescribing messages, particularly when prescribing for new patients.

Health Boards should consider how to raise public awareness to promote environmentally friendly prescribing and encourage individuals to ask prescribers about this at their review.

CO2 emissions in Scotland

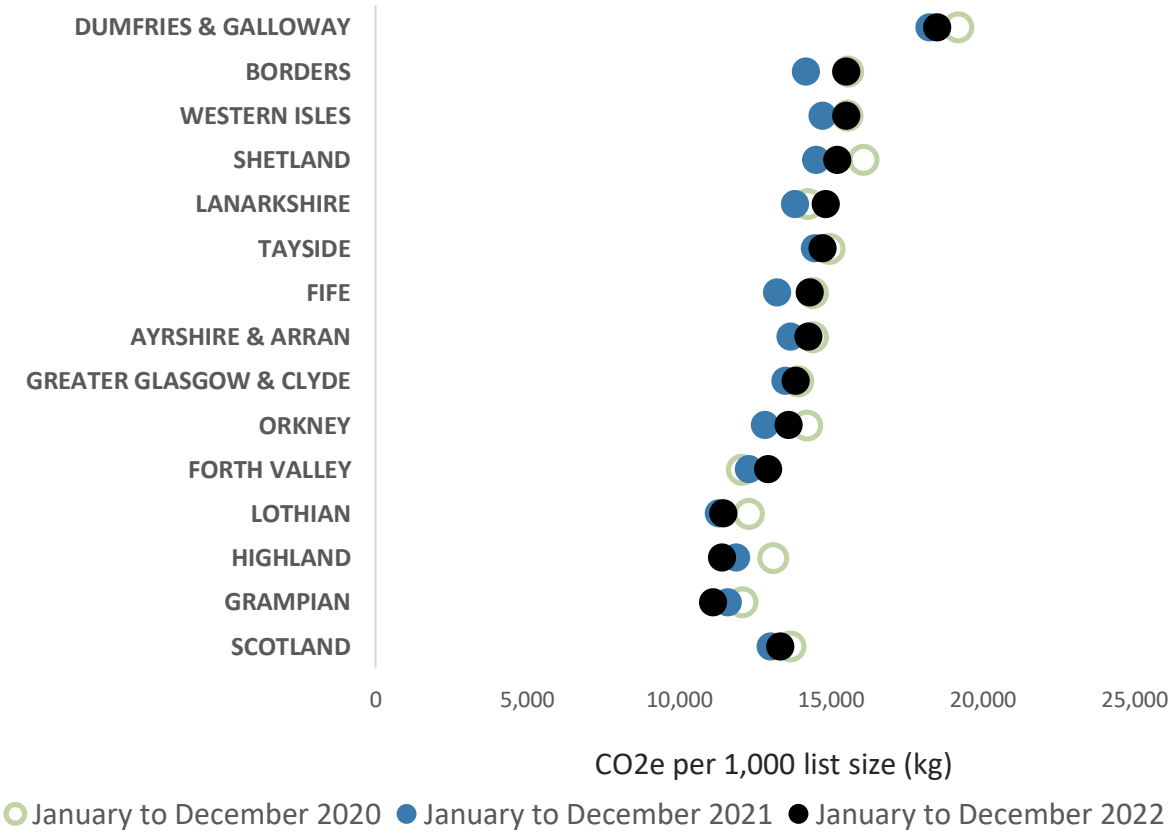
An ambitious target of 70% reduction in CO2 emissions from inhalers by 2028 has been set, as NHS Scotland works towards the commitment of net-zero emissions by 2040. The 70% reduction has been split into biennial targets indicated by the grey lines on chart 14 below:

- a 25% reduction of CO2 emissions is required by the end of 2024
- a 50% reduction of CO2 emissions is required by 2026 and
- a 70% reduction by end of 2028

Prescribing indicators have been developed, as described below, to support achievement of the target.

Chart 14 below shows the CO2 equivalent emissions of inhaler propellant for each Health Board. The calculation is based on an average of 12g per pMDI and assumes a DPI has zero emissions. [6] Other factors such as manufacturing process, plastics used and recycling potential are not included in these calculations.

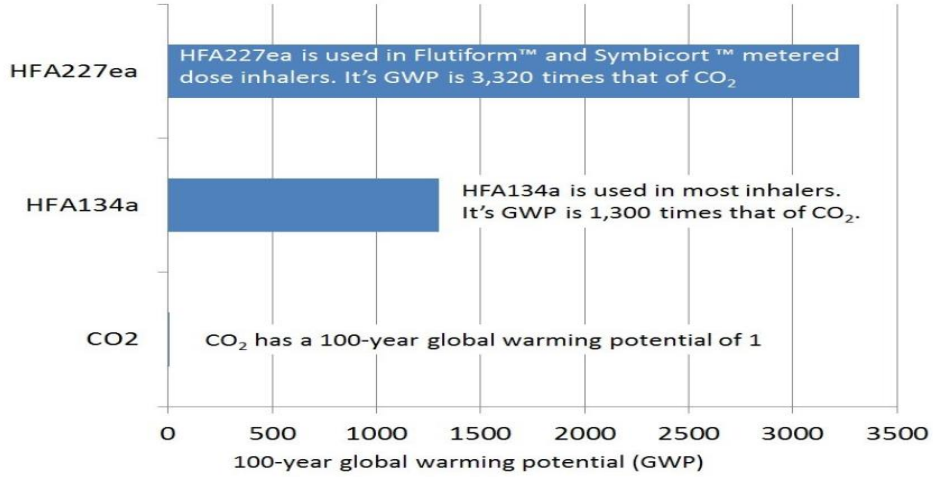
Chart 14: CO2 Emissions (kg) per 1000 patients on list size



Rationale for CO2 emission target

CO2 has a 100- year global warming potential (GWP) of one. pMDI's contain the propellants HFA 134a or HFA 227ea which have 1300 and 3320 higher GWP respectively then CO2. Figure 9 below highlights the differences in GWP of the propellants. [66] All dry powder inhalers and soft mist inhalers have considerably lower GWP than pMDIs.

Figure 9: Global Warming Potential [65]



Greenhouse Gas effect (global warming potential or GWP) of HFA 227ea, HFA134a which is used in most inhalers, and CO2 which is the most abundant greenhouse gas.

New propellants such as HFA 152a and HFO-1234ze will have a low global warming potential and reduce the carbon footprint of pMDIs by at least 90% [69] [70]. There is ongoing development of new propellants within the pharmaceutical sector, predicted to be available by 2025.

PrescQIPP data is available which estimates an indicative total CO2 emission (g) for each inhaler based on the life cycle including manufacturing process, plastics used, recyclable material and propellants contained. [71] A lot of these factors are subject to change, so this guide has focussed on CO2 emissions of the propellant initially to allow NHS Scotland to meet the CO2 reduction targets set. It is acknowledged that recycling of inhalers within NHS Scotland needs to improve and at present it is harder to recycle a DPI. Table 6 gives examples of inhalers and the respective GWP.

Table 6: Examples of pMDIs with different global warming potential

SMI (soft mist inhaler) **Very Low GWP**	**DPI** **Very low GWP**	**HFA 152a containing MDI inhalers due 2025** **Very low GWP**	**HFA 134a containing pMDI** **High GWP**	**HFA 134a containing pMDI (large volume cannister)** **Very high GWP**	**HFA 227ea containing pMDI** **Very high GWP**
Spiriva® Respimat ®	Accuhaler ®	MDI inhalers containing HFA 152a or other propellants due **2025**	Salamol® Easibreathe ® pMDI	Ventolin® pMDI	Flutiform® pMDI
Spiolto® Respimat ®	Easyhaler®		Clenil ® pMDI		Symbicort® pMDI
	Ellipta ®		Seretide ® pMDI		

Environmental prescribing issues to consider

For new patients
Opportunities for environmentally sustainable prescribing should be considered when prescribing inhalers for a new patient.

As there are significant differences in the global warming potential of different pMDIs, the following should be considered:

- use inhalers with a low global warming potential when they are as equally effective[12]
- where there is no alternative to a pMDI, lower volume HFA134a pMDI should be used in preference to large volume or HFA227ea pMDIs [12]
- prescribing decisions should be based on patient preference and ability to use the device - inspiratory flow may be assessed using an In-check® device
- patient should be counselled on expectations of treatment, signs of poor control and importance of adherence and attendance at review
- for patients with asthma use NICE Asthma inhalers and the environment patient decision aid

For existing patients
As part of a person-centred review when optimising treatment, consider the opportunity for using a more carbon friendly inhaler. During the review, prescribers should use their judgement and consider the following:

- aim for the lowest GWP where possible, for example, a DPI or SMI
- switching stable patients from pMDI to DPI for SABA inhalers, where the individual is co-prescribed a DPI combination inhaler [12]
- using combination inhalers in place of separate inhalers to reduce the quantity of inhalers and GWP
- poor control may be due to poor inhaler technique, and if this is a pMDI, then a change to a DPI or SMI may help improve control

See appendix 2 for consideration of when a DPI may not be suitable.

Prescribing Indicators to support reduction of CO2 emissions from inhalers

Proportion of pMDIs versus all inhalers
Chart 15 shows the proportion of pMDIs dispensed as a proportion of all other inhalers (including dry powder inhalers and soft mist inhalers). As detailed above, the UK has a high proportion of pMDI use (70%) compared with the rest of Europe (< 50%) and Scandinavia (10–30%). [64] The grey line on the chart indicates the Scandinavian level of pMDI prescribing at 30% as a comparator. Figures from Scandinavia do not show a higher rate of uncontrolled disease or deaths. [22]

There may be opportunities to discuss inhaler choices with patients at their regular respiratory review. Changes to inhaler type should only take place in discussion with the patient but may be an opportunity to reduce carbon emissions where disease control will not be compromised. An inhaler selection decision aid has been developed to support this guidance, based on appendix 2, and is incorporated into the Respiratory section of the Polypharmacy: Manage Medicines app [7] which supports clinicians and patients when discussing the suitability of a DPI rather than an MDI.

There are links to practical tips and support available from various sources to reduce carbon emissions from pMDIs, for example PrescQIPP and Greener practice. [72, 73]

Chart 15: Proportion of pMDIs versus all inhalers (dry powder and soft mist inhalers)

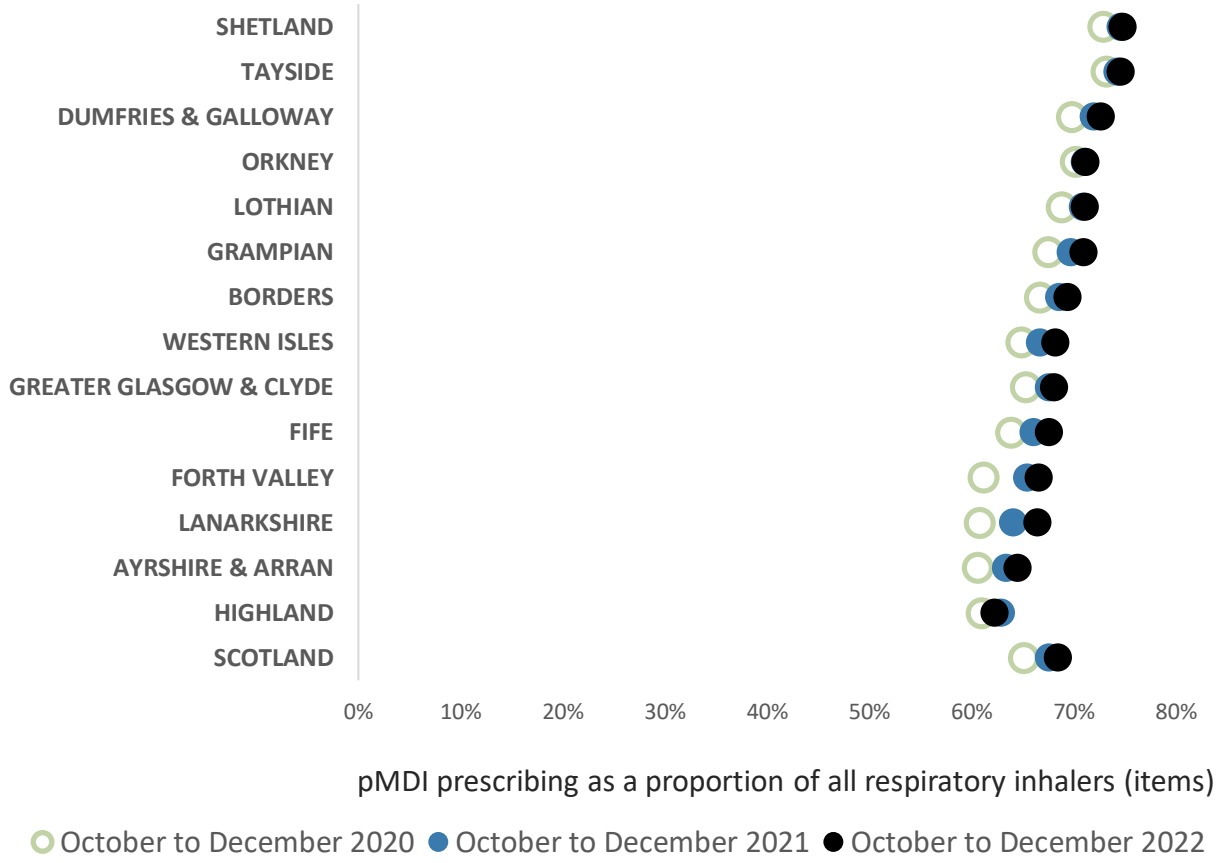
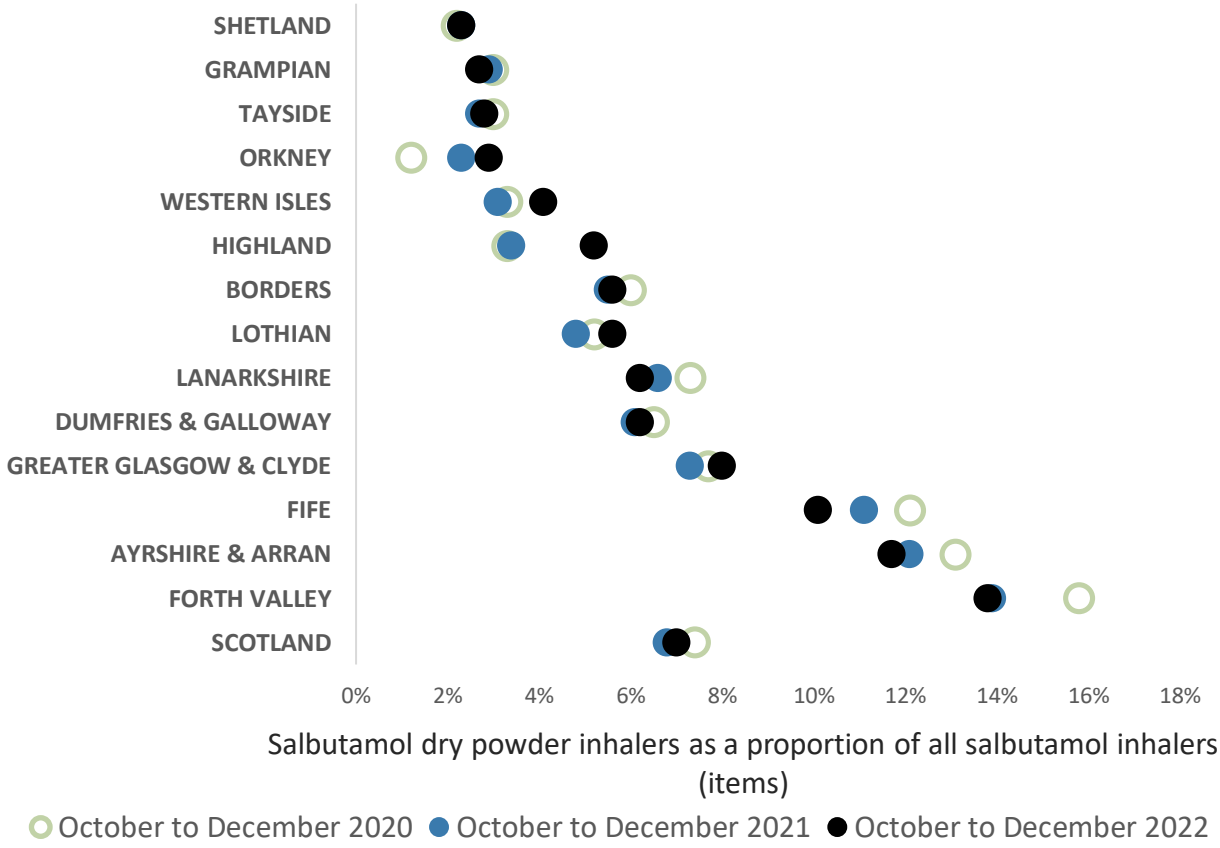


Chart 16 below highlights that the use of DPI for salbutamol is low. In NHS Scotland only 7% of salbutamol inhalers are DPIs. If consideration is given to switching a patient to a DPI the clinician should be confident that the patient can use the DPI for acute circumstances. They may not be suitable for the very young or very old, or those susceptible to severe, acute attacks of breathlessness (see appendix 2).

Chart 16: Salbutamol DPI as a proportion of all salbutamol (items)

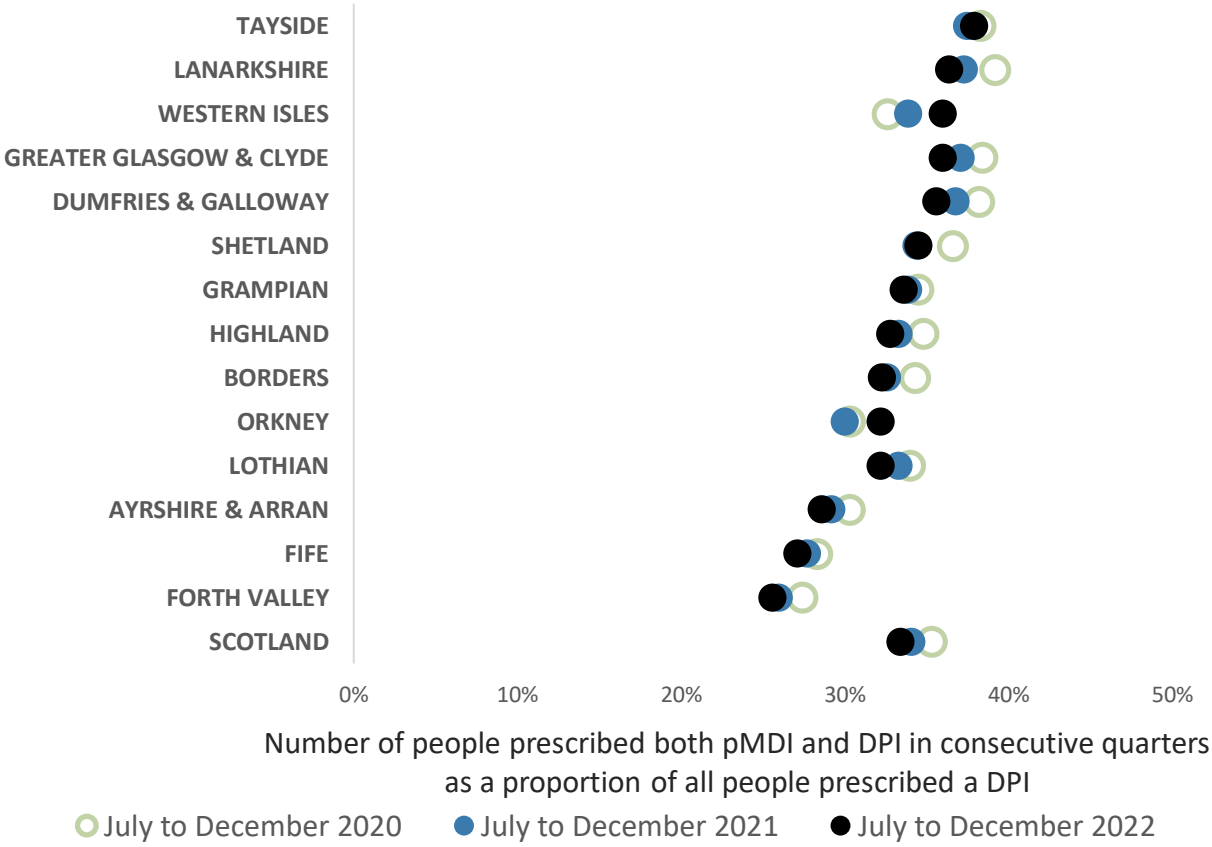


Proportion of patients receiving reliever and preventer inhalers in (BNF Chapter 3) as different devices

Using different devices may cause confusion regarding inhaler technique and lead to increased errors in use. [12] If the patient can use both a pMDI and a DPI then carbon emissions will be reduced if the pMDI inhaler is switched to a DPI.

In chart 17 below, NHS Boards on the right-hand side of the chart have a lower proportion of patients on two different devices. Health care professionals are advised to include this as part of their respiratory review.

Chart 17: People prescribed both pMDI and DPI in consecutive quarters as a proportion of all people prescribed a DPI

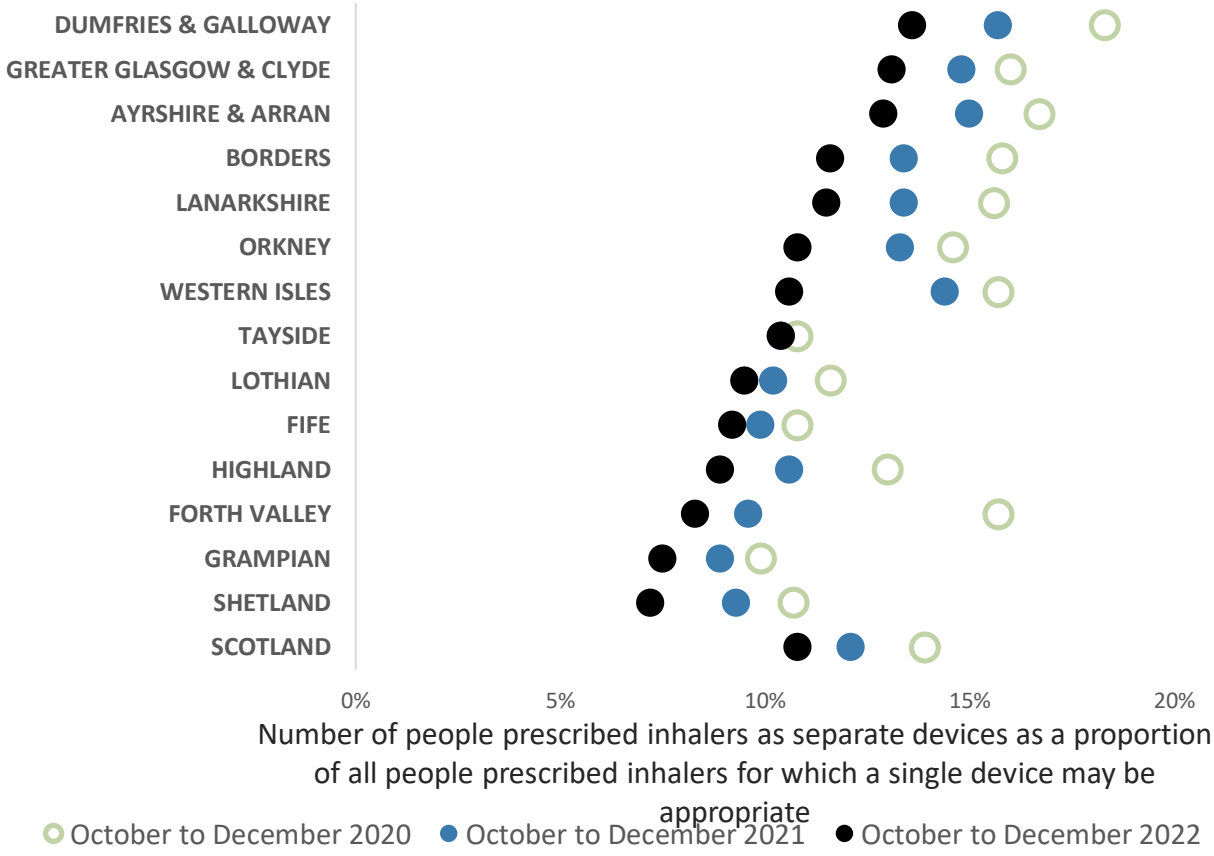


Proportion of patients receiving inhalers which could be prescribed as a combination

Clinicians are recommended to prescribe combination inhalers where appropriate, to improve overall adherence [12] and to guarantee that a LABA is not taken without corticosteroid for asthma. [12] Incorporating this consideration into a respiratory review will also result in reduced overall carbon emissions, as one inhaler is being used instead of two.

Chart 18 indicates those patients who may be considered for a combination inhaler, and all NHS Boards are improving. Please note that not all combination inhalers are licensed for both asthma and COPD. Please refer to individual Summary of Product Characteristics.

Chart 18: People prescribed inhalers as separate devices as a proportion of people prescribed any inhaler for which a combination inhaler may be appropriate



Area wide projects to promote inclusion of environmental focus for local formularies

1. The NHSGGC Asthma and COPD Inhaler device guide includes a traffic light system on their formulary

Figure 10: NHSGGC Inhaler choice guide traffic light system

Environmental Impact	
CO2e	low CO2 emissions
CO2e	high CO2 emissions
CO2e	very high CO2 emissions

2. NHS Tayside include a MCN Green logo on their formulary to highlight the environmentally friendly choice

Figure 11: Tayside Green Logo

Case Study from NHS Lothian highlighting success in reduction of SABA inhalers

Background

Over-reliance of short-acting beta-agonists (SABA) often indicates poor asthma control and is a predictor for future risk of asthma attack and death. The Scottish Therapeutics Utility (STU) tool uses data from GP health records to provide practice-level reports on repeat and high-risk prescribing. STU contains five searches relating to respiratory, including >12 SABA in one year, without a diagnosis of COPD'. STU is installed across Lothian, yet not every practice used it. We aimed to improve primary care prescribing of SABA in NHS Lothian, Scotland, by improving awareness of STU data.

Methods

A training event raised awareness of STU and the ease at which high risk asthmatic patients could be identified. Practices were incentivised to analyse their data and review patients' over-ordering SABA's. We analysed SABA prescribing data extracted from STU before (June 2019) and after the intervention (May 2021).

Results

Before the intervention, >12 SABA were prescribed to an average of 56 patients per practice (standard deviation (SD) 71). There was wide variation in prescribing: per practice, the minimum number of individuals receiving >12 SABA was 10; the highest was 602 patients. Following the intervention, the number of individuals receiving >12 SABA decreased with an average of 36 per practice and a reduction in variation between practices (SD 28).

Lessons learned

Although STU data was available prior to the intervention, few practices were aware of the benefits. Following the intervention, a reduction in the number of individuals who were prescribed >12 SABA per year which was seen across all areas of the health board.

Messages for others

We saw a reduction in SABA over-prescribing in NHS Lothian by promoting the use of primary care data to help educate and encourage practices to change prescribing. To see change, we needed to raise awareness directly with users.

11. Recommendations

Using the clinical guidance and prescribing recommendations contained in this guide

Clinicians should:

Develop a clear management plan collaboratively with patients at the centre adopting the what matters to me? principles and the 7-Steps medication review process. Clinicians should optimise prescribing of medicines, reduce the potential for harm, manage patient expectations and consider the environmental impact of their prescribing.

Follow a clinically appropriate approach to initiation of medication, discussing risks and benefits and incorporating agreed criteria for stopping/continuing medication. Inhaler technique remains a key component of co-production of positive clinical outcomes. Therefore, review of inhaler technique should be undertaken as a priority. This is of particular importance due to the growing variety of inhaler devices – ongoing review is recommended.

Review effectiveness, tolerability and adherence on a regular basis. Medicine burden and waste should be reduced where possible, in line with the Scottish Government's Polypharmacy guidance.

Ensure awareness of relevant changes to inhaler formularies, new inhalers to market, carbon emissions of inhalers and updated guidance.

Pursue non-pharmaceutical approaches wherever possible, either alone or in conjunction with medicines. Self-management should be actively encouraged and supported for appropriate patients.

Clusters should:

Engage with local Medicines Management Teams and review respiratory prescribing data. View the National Therapeutic Indicators for respiratory prescribing including prescribing information by GP cluster on the shinyapp. [74]
Respiratory prescribing issues should be included in the Cluster Quality Improvement plan if deemed a priority. Reduction of carbon emissions is a national priority and this document provides guidance on how to reduce carbon emissions due to respiratory prescribing.

Secondary care teams should:

Engage with pharmacy teams to ensure hospital prescribing is in line with local formulary.

Understand the influence that secondary care prescribing has in the primary care setting and educate associated staff.

Health Boards should:

Consider this guidance alongside the data provided on prescribing positions and trends. Prescribing action plans set out local priorities for how Health Boards will continue to improve quality of medicines management. These action plans should, where appropriate, encourage use of this document to drive that improvement.

Nominate a local lead from within Medicines Management and **a local clinical lead** from within the local Managed Clinical Network or Respiratory Community. The two leads should work closely together to drive delivery and implementation of the recommendations within this document with the local Managed Clinical Network, where possible.

Ensure the primary/secondary care interface is appropriately developed. Given the considerable influence that local secondary care prescribing culture has on primary care clinicians, it is vital to ensure engagement with secondary care clinicians. Encourage ownership of primary care data by clinicians in both settings.

Review local prescribing pathways and formulary and support clinicians, based on current SIGN guidance and environmental issues.

Ensure non-pharmacological management is promoted within prescribing action plans.

12. Scottish Therapeutics Utility (STU)

The Scottish Therapeutics Utility (STU) is a computer programme that uses data from GP IT systems with a focus on repeat prescribing and other clinical areas including respiratory prescribing. It generates a suite of standardised reports to facilitate targeted medicines management activity. The reports populate an interactive dashboard using prescription items issued by an individual practice. STU works alongside the clinical system to provide direct access to the individual patient clinical record for ease of use to make changes if required and supports identification and prioritisation of patients for review.

STU is licensed by the Effective Prescribing and Therapeutics Division at the Scottish Government and is available to GP practices throughout Scotland free of charge. The Pharmacy Team within GP practices are using this programme already and will assist any interested clinicians. Find more information on STU and how to access it on the Effective Prescribing and Therapeutics Division website.

STU searches will support the prescribing indicators discussed in this document to allow identification of patients for review.

The screenshots below show how the searches look within STU. Screenshots are taken from test system with no real patient details displayed.

Figure 12: STU Screenshot – Example from Respiratory Tab - Simple Results

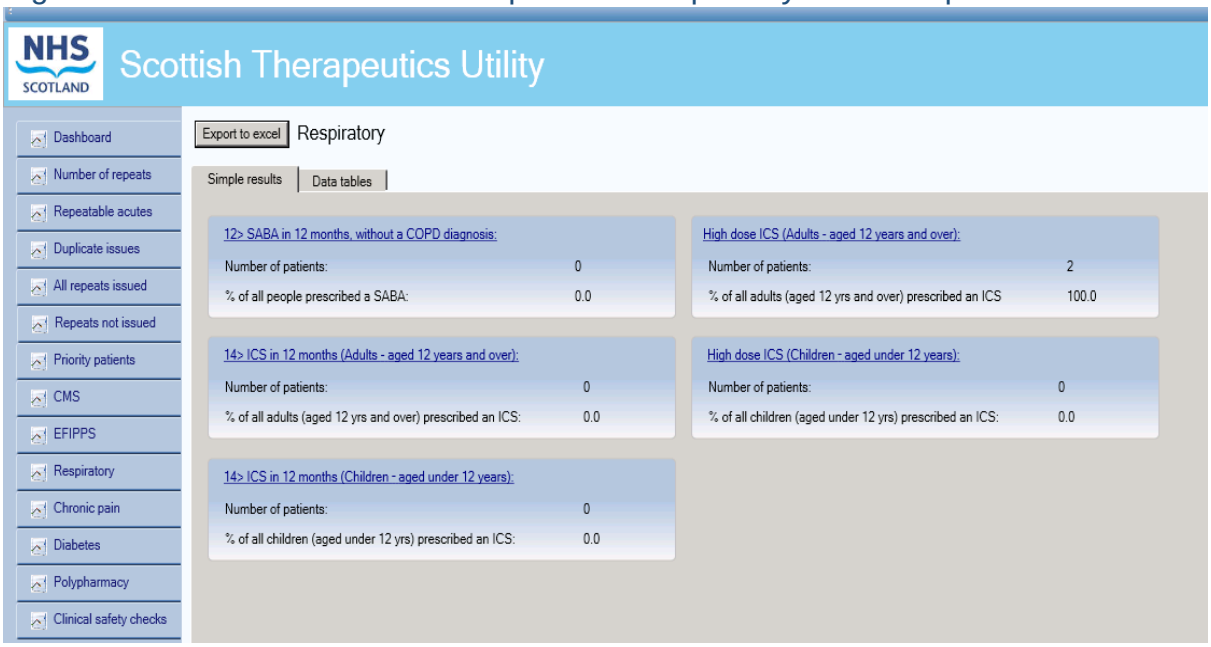


Figure 13: STU Screenshot – Example from Respiratory Tab – Data Tables

Appendix 1 - Resources for clinicians and patients

My Lungs My Life

My Lungs My Life is a comprehensive, free website for anyone living with COPD, asthma or for parents/guardians of children with asthma. The resource is a collaboration between NHS, third sector and the University of Edinburgh.

In addition to general information regarding conditions, videos demonstrating technique on a number of the most commonly prescribed inhaler devices are provided. These may be considered useful when initiating or changing inhalers at a patient level.

Don't Waste a Breath

The Don't Waste a Breath website, developed by NHS Grampian, provides information for patients on inhaler technique and how to recycle inhalers. This website complements My Lungs My Life and is aimed directly at patients.

Personal Asthma Action Plans

There is substantial evidence to support the value of personalised actions plans for asthma in both adults and children. Clinicians should refer to local guidance and resources. Access a generic template from Asthma + Lung UK.

Stepping down of Chronic Asthma Drugs

Following a period of stable asthma, clinicians should consider stepping down treatment. The State of the Art Review 'Why and how to step down chronic asthma drugs' on the BMJ website provides a helpful reference source.

Charity Resources

The Chest Heart and Stroke Scotland website and the Asthma + Lung UK website have lots of information to support health care professionals and patients. There are patient leaflets, booklets and toolkits available for use and both have a patient helpline providing advice.

RESPe

RESPe is a free online learning resource provided by CHSS working with the University of Edinburgh for all healthcare professionals.

Resources to assist GP practices to review environmentally friendly respiratory prescribing

Access PrescQIPP respiratory care resources and campaign materials (developed jointly by NHS England and PrescQIPP). PrescQIPP also showcase good practice examples of projects in respiratory care and signpost to self-care resources available for organisations to use to support their own respiratory care campaigns.

Patient information resources to support environmentally friendly prescribing are included in the resources listed with the PrescQIPP inhaler carbon footprint bulletin e.g. What should I do if I need to use my reliever inhaler often for my asthma? (See example 1 below)

Greener practice has a toolkit designed to help UK general practices improve asthma outcomes whilst also reducing carbon emissions. It contains step-by-step Quality Improvement (QI) projects. Project resources include downloadable searches, educational videos, templates and patient information (See example 2 below).

The Royal College of General Practitioners (RCGP) Green Impact for Health toolkit has been developed and can help any general practice improve their sustainability and environmental impact; reduce their harmful impact on planetary health, the risks of climate change and reduce their practice expenses. It answers the question – 'What can we do in our practice?' and covers many aspects, including prescribing of inhalers.

The Centre for Sustainable Healthcare (CSH) offers strategic input and consultancy on sustainable healthcare research and practice to national and local programmes. There is a CSH network for Sustainable respiratory care with many resources and projects shared. Join the network to access their resources.

Example 1: Patient information leaflet focusing on SABA over reliance from PrescQIPP, which can be adapted for local use

What should I do if I need to use my reliever inhaler often for my asthma?
If you need to use your **reliever** inhaler for **three or more days each week**, then it may be a sign that your asthma is not well controlled.

Continue to use your reliever inhaler when you need it, and make a routine appointment at the GP surgery, so we can see if there is anything we can do to help you.

What can I also do to help myself?

- make sure you use your **preventer** (treatment) inhaler every day even if you don't have any symptoms. This should reduce how much you need to use your reliever inhaler.
- look at your inhaler dose counter, if it has one, or think about ways to help you remember to use your inhaler.
- check that you are using your inhaler correctly so that you get all the benefits from using your inhaler. You can read a leaflet or watch a video on how to use your inhaler.
- follow your asthma action plan, which tells you what to do when your asthma symptoms are getting worse.

What is a reliever inhaler?
Reliever inhalers work quickly when you have symptoms like difficulty breathing, wheezing or coughing.

They contain a medicine that relaxes the muscles in your lungs and so opens your airways. This makes it easier to breathe and stops you from wheezing or coughing.

What is a preventer (treatment) inhaler?
Preventer (treatment) inhalers contain medicines what reduce any swelling or inflammation in your lungs making it easier to breathe.

They shield you from your asthma triggers.

Preventer inhalers should be taken every day as instructed on the label from your pharmacy.

Talk to your doctor, nurse or pharmacist if you are concerned about using an inhaler every day.

Example 2: Patient information leaflet from Greener Practice

View the leaflet 'Inhalers and the environment – choosing an inhaler which is good for you and good for the planet'.

Appendix 2 - When is a dry powder inhaler (DPI) suitable or not?

For patients with asthma who are interested and happy to try a DPI, it is suggested that a DPI device is a suitable option for those who can breathe in through their mouth quickly and deeply over two to three seconds. [1]

Many patients may find DPIs easier to use, especially when given inhaler technique instruction[2], although teaching inhaler technique has positive impacts on disease and patient outcome for all inhalers. [3] Factors such as older age affect inhaler technique but a review was not able to determine whether this was related to dexterity, cognition, physical ability or the device. [4]

DPIs are not an appropriate choice of inhaler for patients who are not able to generate sufficient inspiratory flow. [4,5] An In-check® device can be used to determine inspiratory flow and this can be cross referenced to the manufacturer's recommended minimum inspiratory flow rate for individual device types. Patients aged over 75 years with COPD have a higher prevalence of insufficient inspiratory flow required for a DPI. [6]

Inhaler choices should be made with the patient, ensuring the right device for the right patient. [7]

DPIs may not be suitable [5] for:

- frail, elderly patients
- very young patients
- patients with COPD, with peak inspiratory flow rates less than 45 L/min
- those with muscle weakness

If there is any concern that an individual is at a higher risk of asthma attack or risk of severe attack then remaining on a pMDI reliever plus spacer would seem reasonable. Table 14, SIGN 158 Consider switch to pMDI with lower global-warming potential if this is clinically appropriate (Salamol® or Airomir®).

Reassure those for whom a DPI is unsuitable that the greenest inhaler is the one that they can use effectively to have good disease control, minimise the use of their reliever inhaler and avoid hospitalisation. Good control is better for the individual, and for the environment.

References for Appendix 2 - When is a dry powder inhaler (DPI) suitable or not?

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Appendix 3 - Glossary of abbreviations

A&A	Ayrshire & Arran
ACQ (6)	Asthma control Questionnaire
ACP	Activated Clotting Time
ACT	Asthma Control Test
AF	Atrial fibrillation
AHP	Allied Healthcare Professional
ANA	Anti-Nuclear Antibodies
ANCA	Anti-Neutrophil Cytoplasm Antibodies
ANP	Advanced Nurse Practitioner
ARDs	Acute Respiratory Distress Syndrome
BMI	Body Mass Index
BNF	British National Formulary
BTS	British Thoracic Society
CAT	Computerized Axial Tomography
CF	Cystic Fibrosis
CO2	Carbon dioxide
COPD	Chronic Obstructive Pulmonary Disease
CRP	C-reactive protein
CSH	Centre for Sustainable Health
CXR	Chest X-ray
D&G	Dumfries & Galloway
DEXA	Dual Energy X-ray Absorptiometry
DPI	Dry powder inhaler
DTaP	Diptheria-tetanus-pertussis vaccine
ECG	Electrocardiogram
ERS	European Respiratory Society
EU	European Union
FBC	Full blood count
FeNO	Fractionated Exhaled Nitric oxide
FEV_1	Forced Expiratory Volume in 1 Second
FV	Forth Valley
FVC	Forced Vital Capacity
GGC	Greater Glasgow & Clyde
GOLD	Global Initiative for Chronic Obstructive Lung Disease
GP	General Practitioner
GWI	Global Water Intelligence
GWP	Global warming potential
HFA	Hydrofluoroalkane
HIS	Healthcare Improvement Scotland
HSCP	Health and Social Care Partnership
ICS	Inhaled Corticosteroids
ILD	Interstitial Lung Disease
IPF	Idiopathic pulmonary fibrosis
IT	Information Technology

ITU	Intensive Therapy Unit
LABA	Long-Acting Beta Agonist
LAMA	Long-Acting Muscarinic Antagonist
LRA	Leukotriene receptor antagonists
MAB	Monoclonal antibody
MART	Maintenance and Reliever Therapy
MCN	Managed Clinical Network
MCR	Medicines care and Review
MDI/ pMDI	Metered Dose inhaler (pressurised)
MRC	Medical Research Council – Breathlessness scale
NCDs	Non-communicable Diseases
NHS	National Health Service
NICE	National Institute for Health and Social Care Excellence
NRAD	National Review of Asthma Deaths
NTM	Nontuberculous Mycobacterial
OCS	Oral Corticosteroids
PFTs	Pulmonary Function Tests
PIS	Prescribing Information System
PRISMS	Prescribing Information System for Scotland
QI	Quality Improvement
RAST	RadioAllergosorbent Test
RCGP	Royal College of General Practitioners
SABA	Short Acting Beta Agonists
SAMA	Short-Acting Muscarinic Antagonist
SAPG	Scottish Antimicrobial Prescribing group
Sats	Saturations (Oxygen)
SIGN BTS	Scottish Intercollegiate Guidelines Network / British Thoracic Society
SMC	Scottish Medicines Consortium
SPC	Summary of product characteristics
STU	Scottish Therapeutics Utility
TFT	Thyroid Function Test
Us and Es	Urea and Electrolytes
VBA	Very Brief Advice
WHO	World Health Organisation

Appendix 4 - Data tables from indicator charts

Table 7: People prescribed six or more short-acting beta-agonists (SABA) per annum (Chart 1)

NHS Board	January to December 2020	January to December 2021	January to December 2022
NHS AYRSHIRE & ARRAN	32.5%	31.6%	29.4%
NHS BORDERS	31.7%	31.2%	30.0%
NHS DUMFRIES & GALLOWAY	33.2%	32.5%	30.8%
NHS FIFE	33.1%	32.3%	31.5%
NHS FORTH VALLEY	29.9%	28.8%	27.8%
NHS GRAMPIAN	28.0%	27.7%	26.3%
NHS GREATER GLASGOW & CLYDE	36.5%	35.5%	33.3%
NHS HIGHLAND	30.6%	30.2%	28.2%
NHS LANARKSHIRE	35.3%	33.9%	32.2%
NHS LOTHIAN	33.1%	31.7%	29.6%
NHS ORKNEY	26.5%	25.6%	21.4%
NHS SHETLAND	26.6%	25.8%	23.6%
NHS TAYSIDE	32.4%	31.3%	29.8%
NHS WESTERN ISLES	34.4%	33.2%	32.0%
SCOTLAND	33.4%	32.5%	30.7%

Table 8: People prescribed three or more short-acting beta-agonists (SABA) per annum (Chart 2)

NHS Board	January to December 2020	January to December 2021	January to December 2022
NHS AYRSHIRE & ARRAN	56.0%	54.5%	52.4%
NHS BORDERS	54.8%	53.6%	52.1%
NHS DUMFRIES & GALLOWAY	55.4%	53.5%	52.9%
NHS FIFE	56.2%	54.5%	54.1%
NHS FORTH VALLEY	53.8%	52.4%	51.7%
NHS GRAMPIAN	51.4%	50.8%	49.8%
NHS GREATER GLASGOW & CLYDE	57.9%	56.7%	54.5%
NHS HIGHLAND	53.2%	52.3%	50.5%
NHS LANARKSHIRE	58.8%	56.7%	55.0%
NHS LOTHIAN	55.4%	54.0%	52.2%
NHS ORKNEY	48.5%	47.9%	44.4%
NHS SHETLAND	48.7%	48.1%	47.4%
NHS TAYSIDE	54.7%	53.6%	52.6%
NHS WESTERN ISLES	54.2%	53.7%	53.8%
SCOTLAND	56.1%	54.7%	53.2%

Table 9: Number of SABA pMDIs prescribed per 1,000 list size (Chart 3)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	125.51	131.80	132.41
NHS BORDERS	132.30	138.03	144.44
NHS DUMFRIES & GALLOWAY	157.59	162.97	163.49
NHS FIFE	128.05	136.59	139.45
NHS FORTH VALLEY	102.49	110.86	111.40
NHS GRAMPIAN	95.94	101.91	101.50
NHS GREATER GLASGOW & CLYDE	128.47	136.91	134.39
NHS HIGHLAND	119.92	125.11	117.82
NHS LANARKSHIRE	137.88	145.24	149.68
NHS LOTHIAN	107.95	111.23	106.06
NHS ORKNEY	99.65	99.42	105.71
NHS SHETLAND	112.59	116.89	112.12
NHS TAYSIDE	126.29	134.21	132.35
NHS WESTERN ISLES	135.14	141.18	151.99
SCOTLAND	121.16	127.76	126.55

Table 10: High dose corticosteroid inhalers as a percentage of all corticosteroid inhaler items (using 2019 SIGN/BTS classification of high dose) (Chart 4)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	15.9%	14.8%	14.3%
NHS BORDERS	13.1%	14.4%	15.4%
NHS DUMFRIES & GALLOWAY	14.9%	14.7%	14.7%
NHS FIFE	19.7%	20.4%	21.4%
NHS FORTH VALLEY	14.9%	15.5%	16.3%
NHS GRAMPIAN	15.7%	15.8%	15.7%
NHS GREATER GLASGOW & CLYDE	17.1%	17.2%	18.0%
NHS HIGHLAND	22.4%	21.9%	21.9%
NHS LANARKSHIRE	15.8%	16.3%	17.0%
NHS LOTHIAN	17.3%	17.8%	18.6%
NHS ORKNEY	18.4%	18.0%	18.7%
NHS SHETLAND	19.4%	18.0%	15.8%
NHS TAYSIDE	11.8%	12.6%	12.5%
NHS WESTERN ISLES	21.3%	18.7%	17.7%
SCOTLAND	16.6%	16.8%	17.2%

Table 11: People prescribed a LABA without ICS per 1000 patient size (Chart 5)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	0.69	0.65	0.61
NHS BORDERS	0.53	0.46	0.36
NHS DUMFRIES & GALLOWAY	0.90	0.74	0.60
NHS FIFE	0.54	0.44	0.40
NHS FORTH VALLEY	0.22	0.20	0.18
NHS GRAMPIAN	0.13	0.11	0.10
NHS GREATER GLASGOW & CLYDE	0.83	0.72	0.56
NHS HIGHLAND	0.54	0.45	0.37
NHS LANARKSHIRE	0.17	0.13	0.14
NHS LOTHIAN	0.21	0.20	0.17
NHS ORKNEY	0.36	0.36	0.13
NHS SHETLAND	0.35	0.13	0.30
NHS TAYSIDE	0.35	0.27	0.21
NHS WESTERN ISLES	1.31	1.04	0.81
SCOTLAND	0.45	0.39	0.33

Table 12: Prescribing of SABA only (in absence of other inhalers) (Chart 6)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	20.0%	22.2%	22.8%
NHS BORDERS	19.4%	22.5%	22.5%
NHS DUMFRIES & GALLOWAY	20.8%	23.3%	23.4%
NHS FIFE	20.4%	23.8%	24.0%
NHS FORTH VALLEY	20.5%	23.0%	22.6%
NHS GRAMPIAN	19.8%	23.0%	22.5%
NHS GREATER GLASGOW & CLYDE	20.5%	23.9%	24.2%
NHS HIGHLAND	20.3%	24.3%	24.9%
NHS LANARKSHIRE	19.2%	22.8%	23.6%
NHS LOTHIAN	20.8%	24.1%	24.2%
NHS ORKNEY	20.4%	22.0%	23.7%
NHS SHETLAND	19.0%	19.6%	22.9%
NHS TAYSIDE	18.8%	21.4%	21.0%
NHS WESTERN ISLES	21.0%	22.4%	22.7%
SCOTLAND	20.0%	23.2%	23.4%

Table 13: Number of Montelukast doses prescribed per 1000 list size of population (Chart 7)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	724.13	733.51	757.25
NHS BORDERS	630.80	624.85	664.66
NHS DUMFRIES & GALLOWAY	672.49	715.90	766.32
NHS FIFE	727.52	744.48	753.05
NHS FORTH VALLEY	609.54	649.16	675.26
NHS GRAMPIAN	535.77	559.98	568.78
NHS GREATER GLASGOW & CLYDE	426.23	438.71	454.68
NHS HIGHLAND	533.83	548.13	544.58
NHS LANARKSHIRE	739.05	756.37	800.09
NHS LOTHIAN	411.99	414.31	423.09
NHS ORKNEY	492.73	639.41	690.21
NHS SHETLAND	842.94	842.10	880.14
NHS TAYSIDE	633.39	641.95	639.02
NHS WESTERN ISLES	408.71	440.38	566.52
SCOTLAND	519.78	533.60	548.94

Table 14: Number of people with severe asthma receiving biologics as a proportion of the estimated severe asthma population (Chart 8)

NHS Board	Total number of patients on biologics for severe asthma	Total weighted patient list size*	Patients on treatment / weighted 100,000 patients	Potential population with severe asthma (est 4% of asthma population)
NHS AYRSHIRE & ARRAN	58	386625	15.00	773
NHS BORDERS	21	120675	17.40	241
NHS DUMFRIES & GALLOWAY	26	144499	17.99	289
NHS FIFE	30	392751	7.64	786
NHS FORTH VALLEY	62	323774	19.15	648
NHS GRAMPIAN	397	1334720	29.74	2669
NHS GREATER GLASGOW & CLYDE	151	600359	25.15	1201
NHS HIGHLAND	64	338204	18.92	676
NHS LANARKSHIRE	140	693596	20.18	1387
NHS LOTHIAN	201	1002978	20.04	2006
NHS TAYSIDE	180	434197	41.46	868
SCOTLAND	1330	5772378	23.04	11545

Table 15: Mucolytic Prescribing (Chart 9)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	2.11	2.04	1.90
NHS BORDERS	1.18	1.39	1.33
NHS DUMFRIES & GALLOWAY	1.98	1.78	1.62
NHS FIFE	0.76	0.76	0.64
NHS FORTH VALLEY	1.59	1.59	1.31
NHS GRAMPIAN	0.78	0.83	0.78
NHS GREATER GLASGOW & CLYDE	2.25	2.13	1.80
NHS HIGHLAND	1.09	1.07	0.99
NHS LANARKSHIRE	2.03	1.94	1.75
NHS LOTHIAN	0.36	0.38	0.35
NHS ORKNEY	1.32	1.68	1.42
NHS SHETLAND	0.53	0.48	0.58
NHS TAYSIDE	0.88	0.79	0.61
NHS WESTERN ISLES	1.89	2.22	2.21
SCOTLAND	1.47	1.42	1.24

Table 16: Number of people receiving triple therapy (either as separate or single inhalers) (Chart 10)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	14.58	14.60	15.42
NHS BORDERS	11.50	11.55	12.11
NHS DUMFRIES & GALLOWAY	14.70	15.05	15.93
NHS FIFE	9.61	9.98	11.25
NHS FORTH VALLEY	11.58	11.93	12.05
NHS GRAMPIAN	8.56	8.81	9.16
NHS GREATER GLASGOW & CLYDE	11.68	11.93	12.31
NHS HIGHLAND	9.25	9.44	9.31
NHS LANARKSHIRE	13.37	13.64	13.99
NHS LOTHIAN	8.30	8.23	8.40
NHS ORKNEY	8.04	9.75	9.67
NHS SHETLAND	7.36	7.61	7.90
NHS TAYSIDE	11.34	12.31	13.23
NHS WESTERN ISLES	6.42	6.92	6.23
SCOTLAND	10.88	11.12	11.54

Table 17: Number of people prescribed triple therapy as a single device as a proportion of all patients prescribed triple therapy (Chart 11)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	50.9%	54.8%	61.5%
NHS BORDERS	42.2%	50.9%	58.2%
NHS DUMFRIES & GALLOWAY	42.3%	50.2%	57.6%
NHS FIFE	51.7%	57.5%	62.9%
NHS FORTH VALLEY	49.5%	69.7%	74.0%
NHS GRAMPIAN	60.3%	64.5%	71.1%
NHS GREATER GLASGOW & CLYDE	51.5%	55.6%	60.2%
NHS HIGHLAND	47.4%	57.7%	65.3%
NHS LANARKSHIRE	44.8%	52.5%	59.2%
NHS LOTHIAN	54.2%	59.3%	62.6%
NHS ORKNEY	44.6%	54.2%	59.1%
NHS SHETLAND	50.9%	57.1%	64.3%
NHS TAYSIDE	62.0%	64.7%	66.0%
NHS WESTERN ISLES	25.0%	33.7%	47.9%
SCOTLAND	51.4%	57.7%	62.9%

Table 18: Respiratory Costs per treated patient (Chart 12)

NHS Board	January to December 2020	January to December 2021	January to December 2022
NHS AYRSHIRE & ARRAN	£177	£171	£162
NHS BORDERS	£170	£167	£161
NHS DUMFRIES & GALLOWAY	£167	£163	£152
NHS FIFE	£172	£168	£162
NHS FORTH VALLEY	£178	£174	£167
NHS GRAMPIAN	£165	£164	£158
NHS GREATER GLASGOW & CLYDE	£176	£172	£165
NHS HIGHLAND	£171	£169	£160
NHS LANARKSHIRE	£181	£174	£163
NHS LOTHIAN	£163	£159	£151
NHS ORKNEY	£156	£157	£140
NHS SHETLAND	£143	£144	£132
NHS TAYSIDE	£172	£178	£175
NHS WESTERN ISLES	£154	£146	£135
SCOTLAND	£174	£171	£163

Table 19: Proportion of generically prescribed inhalers as a proportion of all inhaler (excluding salbutamol) (Chart 13)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	8.3%	7.1%	5.9%
NHS BORDERS	7.9%	7.2%	6.7%
NHS DUMFRIES & GALLOWAY	15.6%	13.5%	12.4%
NHS FIFE	6.6%	6.3%	6.0%
NHS FORTH VALLEY	5.2%	4.4%	4.2%
NHS GRAMPIAN	7.2%	6.8%	6.5%
NHS GREATER GLASGOW & CLYDE	9.3%	8.0%	7.0%
NHS HIGHLAND	7.8%	6.8%	6.3%
NHS LANARKSHIRE	6.7%	6.1%	5.6%
NHS LOTHIAN	9.3%	8.0%	6.3%
NHS ORKNEY	9.0%	6.8%	6.0%
NHS SHETLAND	11.1%	10.3%	8.7%
NHS TAYSIDE	4.9%	4.8%	4.4%
NHS WESTERN ISLES	19.2%	18.9%	17.6%
SCOTLAND	8.1%	7.2%	6.4%

Table 20: CO2 Emissions (kg) per 1000 patients on list size (including targets)(Chart 14)

NHS Board	January to December 2020	January to December 2021	January to December 2022
NHS AYRSHIRE & ARRAN	14,405	13,686	14,262
NHS BORDERS	15,571	14,181	15,511
NHS DUMFRIES & GALLOWAY	19,192	18,263	18,508
NHS FIFE	14,395	13,237	14,318
NHS FORTH VALLEY	12,055	12,307	12,940
NHS GRAMPIAN	12,091	11,611	11,118
NHS GREATER GLASGOW & CLYDE	13,918	13,518	13,837
NHS HIGHLAND	13,089	11,888	11,429
NHS LANARKSHIRE	14,241	13,830	14,836
NHS LOTHIAN	12,294	11,322	11,468
NHS ORKNEY	14,223	12,824	13,607
NHS SHETLAND	16,076	14,514	15,223
NHS TAYSIDE	14,951	14,485	14,729
NHS WESTERN ISLES	15,550	14,725	15,510
SCOTLAND	13,666	13,032	13,347

Table 21: Proportion of pMDIs versus all inhalers (dry powder and soft mist inhalers) (Chart 15)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	60.6%	63.4%	64.5%
NHS BORDERS	66.7%	68.6%	69.4%
NHS DUMFRIES & GALLOWAY	69.8%	72.0%	72.7%
NHS FIFE	63.9%	66.1%	67.6%
NHS FORTH VALLEY	61.2%	65.5%	66.6%
NHS GRAMPIAN	67.5%	69.7%	71.0%
NHS GREATER GLASGOW & CLYDE	65.3%	67.6%	68.1%
NHS HIGHLAND	61.0%	62.9%	62.3%
NHS LANARKSHIRE	60.8%	64.1%	66.5%
NHS LOTHIAN	68.8%	70.9%	71.1%
NHS ORKNEY	70.2%	71.1%	71.2%
NHS SHETLAND	72.9%	74.6%	74.8%
NHS TAYSIDE	73.2%	74.3%	74.6%
NHS WESTERN ISLES	64.9%	66.7%	68.2%
SCOTLAND	65.1%	67.6%	68.5%

Table 22: Salbutamol DPI as a proportion of all salbutamol (items)(Chart 16)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	13.1%	12.1%	11.7%
NHS BORDERS	6.0%	5.5%	5.6%
NHS DUMFRIES & GALLOWAY	6.5%	6.1%	6.2%
NHS FIFE	12.1%	11.1%	10.1%
NHS FORTH VALLEY	15.8%	13.9%	13.8%
NHS GRAMPIAN	3.0%	2.9%	2.7%
NHS GREATER GLASGOW & CLYDE	7.7%	7.3%	8.0%
NHS HIGHLAND	3.3%	3.4%	5.2%
NHS LANARKSHIRE	7.3%	6.6%	6.2%
NHS LOTHIAN	5.2%	4.8%	5.6%
NHS ORKNEY	1.2%	2.3%	2.9%
NHS SHETLAND	2.2%	2.3%	2.3%
NHS TAYSIDE	3.0%	2.7%	2.8%
NHS WESTERN ISLES	3.3%	3.1%	4.1%
SCOTLAND	7.4%	6.8%	7.0%

Table 23: People prescribed both pMDI and DPI in consecutive quarters as a proportion of all people prescribed a DPI (Chart 17)

NHS Board	July to December 2020	July to December 2021	July to December 2022
NHS AYRSHIRE & ARRAN	30.3%	29.2%	28.6%
NHS BORDERS	34.3%	32.6%	32.3%
NHS DUMFRIES & GALLOWAY	38.2%	36.8%	35.6%
NHS FIFE	28.3%	27.7%	27.1%
NHS FORTH VALLEY	27.4%	26.0%	25.6%
NHS GRAMPIAN	34.5%	33.9%	33.6%
NHS GREATER GLASGOW & CLYDE	38.4%	37.1%	36.0%
NHS HIGHLAND	34.8%	33.3%	32.8%
NHS LANARKSHIRE	39.2%	37.3%	36.4%
NHS LOTHIAN	34.0%	33.3%	32.2%
NHS ORKNEY	30.3%	30.0%	32.2%
NHS SHETLAND	36.6%	34.4%	34.5%
NHS TAYSIDE	38.3%	37.5%	37.9%
NHS WESTERN ISLES	32.6%	33.9%	36.0%
SCOTLAND	35.3%	34.1%	33.4%

Table 24: People prescribed inhalers as separate devices as a proportion of people prescribed any inhaler for which a combination inhaler may be appropriate (Chart 18)

NHS Board	October to December 2020	October to December 2021	October to December 2022
NHS AYRSHIRE & ARRAN	16.7%	15.0%	12.9%
NHS BORDERS	15.8%	13.4%	11.6%
NHS DUMFRIES & GALLOWAY	18.3%	15.7%	13.6%
NHS FIFE	10.8%	9.9%	9.2%
NHS FORTH VALLEY	15.7%	9.6%	8.3%
NHS GRAMPIAN	9.9%	8.9%	7.5%
NHS GREATER GLASGOW & CLYDE	16.0%	14.8%	13.1%
NHS HIGHLAND	13.0%	10.6%	8.9%
NHS LANARKSHIRE	15.6%	13.4%	11.5%
NHS LOTHIAN	11.6%	10.2%	9.5%
NHS ORKNEY	14.6%	13.3%	10.8%
NHS SHETLAND	10.7%	9.3%	7.2%
NHS TAYSIDE	10.8%	10.4%	10.4%
NHS WESTERN ISLES	15.7%	14.4%	10.6%
SCOTLAND	13.9%	12.1%	10.8%

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Patient Information Guide - Respiratory Conditions

Who is the guide for?
This guide is for people with asthma, Chronic Obstructive Pulmonary Disease (COPD), bronchiectasis and Idiopathic Pulmonary Fibrosis (IPF). Family members, friends and carers of individuals with respiratory conditions may also find this guide helpful.

What is this Respiratory Medicine Guide about?
This guide was developed to help you make informed decisions about your respiratory medicines. It provides information on medicines used in asthma, COPD, bronchiectasis and IPF. This guide is a shortened version of the Quality Respiratory Prescribing Guide produced by Scottish Government in conjunction with Experts by Experience and experts across NHS Scotland.

This guide provides evidence and reasons for treatment whilst trying to avoid unnecessary medicines and risk of harm from medicines. It also aims to help you prepare for a respiratory review, and where relevant, provides information on how to identify the right inhaler for your needs.

What are the key issues to be aware of in respiratory conditions?
It is important for all people with respiratory conditions to have a regular review with their health care provider. This ensures that you are receiving the right treatment to best manage and control your condition.

Environmental considerations
During a review, you will be offered the opportunity to consider the environmental impact of your treatment. For example, reviewing inhalers to consider a more environmentally friendly alternative where appropriate, discussion of safe disposal or recycling (where available), and stopping unnecessary medicine to reduce medicines waste.

How are the conditions treated?

Asthma
Asthma can be treated with medicines that people breathe in through an inhaler. The medicine can be delivered as a gas or a powder.

Some inhalers have medicines that are used to help prevent and control asthma. These are called ‘preventers’ and should be used regularly, as directed. The preventer medication reduces inflammation in the airways, which relieves the symptoms of breathlessness, cough and wheeze and prevents flare ups.

Other inhalers have medicine that helps to immediately relieve the effect of an asthma attack. These are called ‘relievers’. The reliever inhaler reduces breathlessness by relaxing the muscles around the airways.

Reliever inhalers should not be used regularly. They are for use during an asthma attack or period of breathlessness. If a reliever inhaler is being used more than three times a week, it may indicate that preventer therapy needs to be reviewed.
We recommend that people should have a medication review if they are:

- prescribed more than three reliever inhalers per year
- using high strength corticosteroid inhalers
- only using a reliever inhaler
- not ordering their preventer inhalers

We recommend that people should be seen for a priority review if they are prescribed six or more reliever inhalers a year.

People taking high dose inhaled corticosteroids should be given a steroid safety card. And if the dose of inhaled corticosteroids needs to be reduced, this should be decreased by approximately 25–50% every three months.

Chronic Obstructive Pulmonary Disease (COPD)
COPD can be treated with a range of therapies, including inhaler therapy, and mucolytics. Mucolytics are medicines that make the mucus less thick and sticky and easier to cough up.

These medicines help relieve the symptoms of breathlessness. They also help reduce the frequency and severity of flare ups (exacerbations) in COPD.

Oral corticosteroids are used to treat exacerbations (flare ups) in COPD. Sometimes antibiotics, which are medicines that treat bacterial infections, will be used to treat exacerbations. Most courses are for five days to help reduce antibiotic resistance. If the infection does not clear up after the antibiotic course, a sputum (phlegm) sample may be required, to help identify the right treatment.

We recommend that people should have a review if they:

- have started taking inhaled corticosteroids
- are on mucolytic therapy
- are using multiple inhalers that could be switched to a triple therapy inhaler
- have been recently switched to a triple therapy inhaler

We recommend that stopping treatment in the following cases:

- inhaled corticosteroids should be stopped if there is insufficient response or if there are adverse effects

- mucolytic therapy should be stopped if there is no productive cough or if symptoms have not improved with use

Bronchiectasis
Bronchiectasis can be treated with mucolytics and antibiotics. Mucolytics are medicines that make the mucus less thick and sticky and easier to cough up. Antibiotics are medicines that treat bacterial infections.

These medicines help relieve the symptoms of breathlessness. They also assist with sputum (phlegm) clearance and reducing frequency and severity of bacterial infections (exacerbations).

We recommend that:

- people taking mucolytics should have a review every six months to determine how well the medicine is working
- antibiotics should be selected based on positive sputum (phlegm) cultures - if there is no positive sputum (phlegm) culture, a, broad spectrum oral antibiotic should be used to cover common respiratory pathogens
- where someone has four or more exacerbations in any 12-month period, we recommend that a specialist considers treatment with azithromycin 250mg, three times a week

Idiopathic pulmonary fibrosis
Idiopathic pulmonary fibrosis (IPF) can be treated with antifibrotics. Antifibrotics can help to slow down the build-up of scar tissue in the lungs. These medicines relieve symptoms of breathlessness and cough. They also preserve lung function whilst minimising side effects.

We recommend that antifibrotics should only be prescribed:

- by a clinician with experience of treating IPF
- when there is confirmed fibrotic lung disease with evidence of physiological progression

How will your treatment be monitored?
Healthcare professionals will determine how well treatment is working by monitoring:

- symptoms, such as how often a person gets breathless, has a wheeze or has a cough
- how often a person uses their reliever inhaler
- ability to take part in physical activity with minimal symptoms (asthma)
- lung function, through peak flow monitoring and spirometry

- levels of blood oxygen at rest and when mobile, using an oxygen saturation monitor

If you are being treated with long term azithromycin (an antibiotic), side effects are monitored using echocardiogram (ECG), hearing tests and liver function tests.

Are there any unwanted effects of treatment?

Sometimes medicines that treat illness or manage symptoms also have unwanted side effects.

Using a reliever inhaler often can cause a fine tremor (shaking), that you might notice in your hands. This may be a sign that preventer treatment needs to be changed or restarted.

Using inhaled corticosteroids too often or incorrectly can lead to increased risk of:

- oral thrush - this can be reduced by improving inhaler technique and using a spacer with an inhaler
- pneumonia – the risk versus the benefit of treatment can be discussed with a healthcare provider
- adrenal insufficiency (not producing enough cortisol) - this is associated with high doses of corticosteroids
- osteoporosis – this can be reduced by using minimum corticosteroid doses and there are actions that can improve bone health

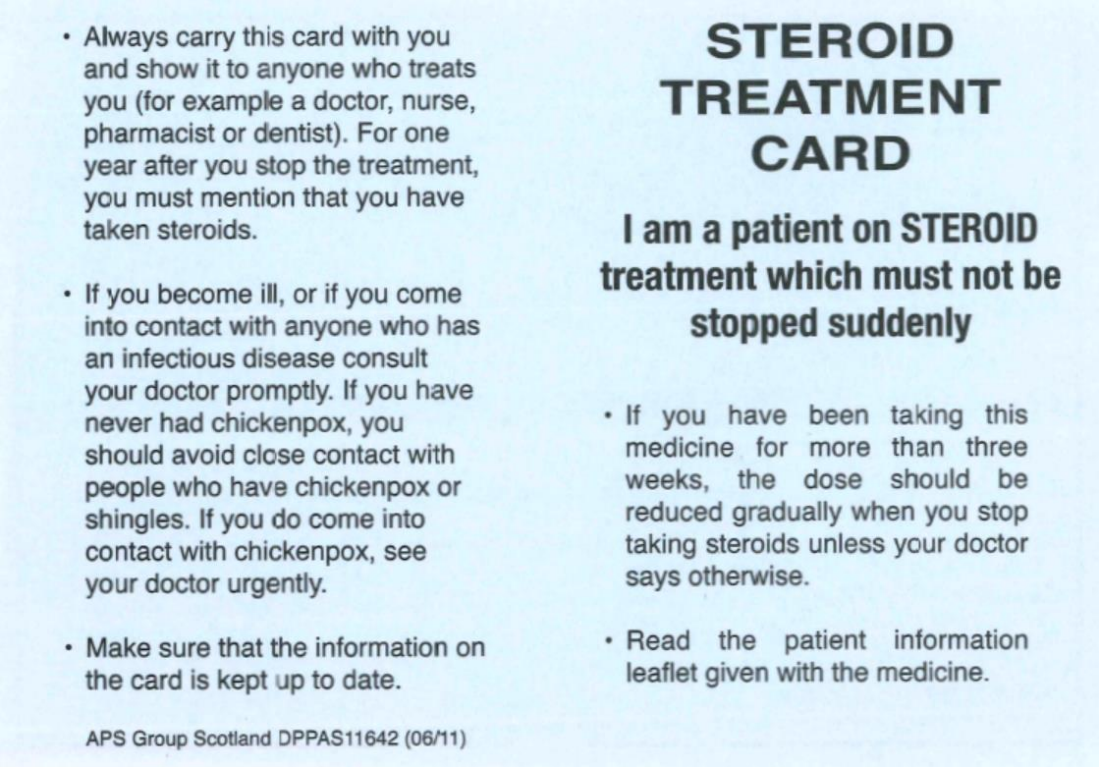
Using anti-muscarinic antagonist inhalers (for example, ipratropium, tiotropium, glycopyrronium, aclidinium and umeclidinium) can cause people to experience dry mouth.

When using long term antibiotics, there is a risk of drug-drug interactions. Medication should be reviewed to reduce the likelihood of these side effects.

The anti-fibrotics used to treat IPF can cause lots of different side effects. These include: liver damage, diarrhoea, nausea, abdominal pain, weight loss and decreased appetite indigestion, photosensitivity and rashes. People on these medicines should have their blood tested and monitored regularly.

If you are taking high dose corticosteroids, you should be given a steroid treatment card. The card records the dose of steroids and should be shown to anyone providing treatment, for example a doctor or dentist (see figure 1).

Figure 4: Blue steroid treatment card



- Always carry this card with you and show it to anyone who treats you (for example a doctor, nurse, pharmacist or dentist). For one year after you stop the treatment, you must mention that you have taken steroids.
- If you become ill, or if you come into contact with anyone who has an infectious disease consult your doctor promptly. If you have never had chickenpox, you should avoid close contact with people who have chickenpox or shingles. If you do come into contact with chickenpox, see your doctor urgently.
- Make sure that the information on the card is kept up to date.

APS Group Scotland DPPAS11642 (06/11)

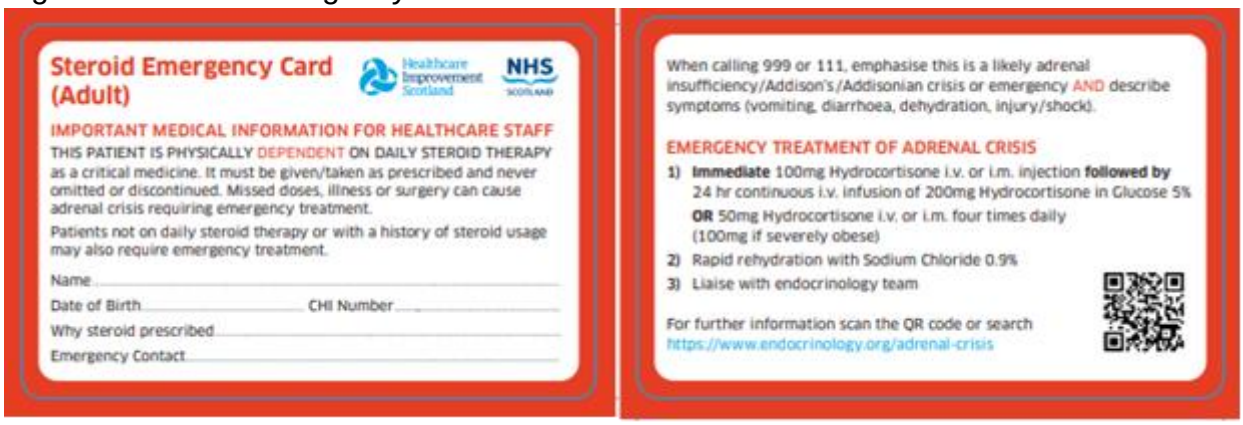
STEROID TREATMENT CARD

I am a patient on STEROID treatment which must not be stopped suddenly

- If you have been taking this medicine for more than three weeks, the dose should be reduced gradually when you stop taking steroids unless your doctor says otherwise.
- Read the patient information leaflet given with the medicine.

In addition, there is a steroid emergency card which highlights the risks of adrenal insufficiency and how to treat them (see figure 2).

Figure 5: Steroid emergency card



Steroid Emergency Card (Adult)

Healthcare Improvement Scotland NHS SCOTLAND

IMPORTANT MEDICAL INFORMATION FOR HEALTHCARE STAFF

THIS PATIENT IS PHYSICALLY DEPENDENT ON DAILY STEROID THERAPY as a critical medicine. It must be given/taken as prescribed and never omitted or discontinued. Missed doses, illness or surgery can cause adrenal crisis requiring emergency treatment.

Patients not on daily steroid therapy or with a history of steroid usage may also require emergency treatment.

Name

Date of Birth CHI Number

Why steroid prescribed

Emergency Contact

When calling 999 or 111, emphasise this is a likely adrenal insufficiency/Addison's/Addisonian crisis or emergency AND describe symptoms (vomiting, diarrhoea, dehydration, injury/shock).

EMERGENCY TREATMENT OF ADRENAL CRISIS

1) **Immediate** 100mg Hydrocortisone i.v. or i.m. injection **followed by** 24 hr continuous i.v. infusion of 200mg Hydrocortisone in Glucose 5% **OR** 50mg Hydrocortisone i.v. or i.m. four times daily (100mg if severely obese)
2) Rapid rehydration with Sodium Chloride 0.9%
3) Liaise with endocrinology team

For further information scan the QR code or search https://www.endocrinology.org/adrenal-crisis

If you feel you might need a steroid treatment card or emergency card, please contact your health care provider for advice.

How will your treatment be reviewed?
All people with respiratory conditions should have a medicine review every year to make sure treatment is still appropriate. A healthcare provider might recommend reviewing medicines more often if medication has been changed, if symptoms are getting worse, or if symptoms are happening more often.

People with asthma and COPD may benefit from a personalised self-management plan. The plan should be discussed and agreed with your healthcare professional who reviews your asthma. This could be your nurse, GP or pharmacist. A plan provides guidance for how often reviews should take place and when to seek help beyond regular reviews.

What guidance is available for specific groups?
Rescue packs of oral corticosteroids and antibiotics may be issued to some people at risk of frequent or severe flare ups, for example, in COPD or bronchiectasis.

Pulmonary rehabilitation may be suitable to help achieve the maximum benefit from lung function.

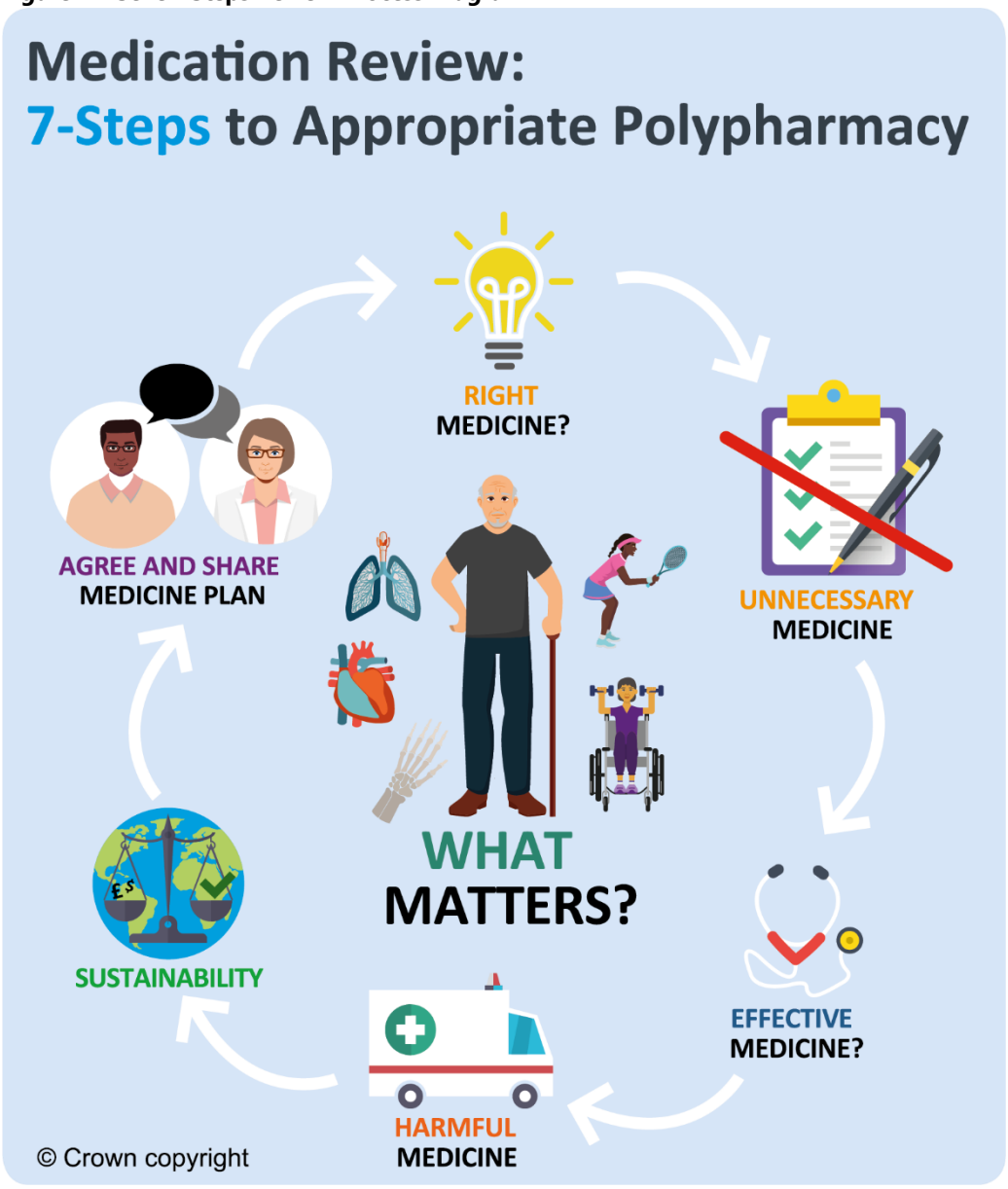
Sputum clearance advice is an important management tool for people with bronchiectasis. This is usually taught by a physiotherapist.

Lifestyle information
Healthcare providers will be able to offer healthy lifestyle information and advice which can help individuals manage and improve respiratory conditions. Respiratory conditions can be helped by considering the following:

- stopping smoking - there are many options available to help, such as free services at the community pharmacy or smoking cessation services
- keeping active and engaging with exercises offered at pulmonary rehabilitation classes.
- keeping vaccinations up to date (including influenza, pneumococcal, COVID-19, diphtheria, tetanus, and pertussis)
- maintaining a healthy weight, diet and alcohol intake
- attending local support groups, to help maintain lifestyle changes

The seven-steps review process
The seven-steps review process is used across Scotland when reviewing people's medicines. The steps below will take you through the journey and the treatment of your respiratory condition.

Figure 2 – Seven-Steps Review Process Diagram



Where can people with respiratory illness find out more information?

Table 1 – Information Resources

Resource	
NHS Inform	NHS inform has information on the symptoms, causes and treatment for a range of respiratory illnesses.
My Lungs My Life	My Lungs My Life is a comprehensive, free website for anyone living with COPD, asthma or for parents/guardians of children with asthma. The resource is a collaboration between NHS, third sector and the University of Edinburgh.
Don't Waste a Breath	The Don't Waste a Breath website, developed by NHS Grampian, provides information for patients on inhaler technique and how to recycle inhalers. This website complements *My Lungs My Life.*
Charity Resources	The Chest Heart and Stroke Scotland and Asthma + Lung UK | Asthma home have lots of information to support patients including patient leaflets, booklets and toolkits and both have a patient helpline providing advice
Personal Asthma Action Plans	There is substantial evidence to support the value of personalised actions plans for asthma in both adults and children. Access a generic template from Asthma + Lung UK.

Respondent Information Form

Scottish Government
Riaghaltas na h-Alba

Please Note this form **must** be completed and returned with your response.

Are you responding as an individual or an organisation?

☐ Individual

☐ Organisation

If you are responding as an individual, are you?

☐ Sufferer

☐ Carer

☐ Clinician

☐ Other

☐ Prefer not to answer

Full name or organisation's name

Phone number

Address

Postcode

Email

The Scottish Government would like your permission to publish your consultation response. Please indicate your publishing preference:

☐ Publish response with name

☐ Publish response only (without name)

☐ Do not publish response

Information for organisations:

The option 'Publish response only (without name)' is available for individual respondents only. If this option is selected, the organisation name will still be published.

If you choose the option 'Do not publish response', your organisation name may still be listed as having responded to the consultation in, for example, the analysis report.

We will share your response internally with other Scottish Government policy teams who may be addressing the issues you discuss. They may wish to contact you again in the future, but we require your permission to do so. Are you content for Scottish Government to contact you again in relation to this consultation exercise?

☐ Yes

☐ No

Consultation Questions
We have a total of 12 questions with some being multi-part, please answer as many as you feel able to.

1. Approach to review

We recommend for all patients, medications are reviewed using a person-centred approach using the standardised Polypharmacy 7-Steps guidance.

Question 1a
Do you agree with this recommendation?
(Yes/No/Not sure)

Question 1b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 1c
Please tell us more about your views on our approach to review:

2. For adults with asthma

We recommend that people should have a person-centred medication review if they are:

- prescribed more than three short-acting beta agonist (SABA) reliever inhalers per year
- using high strength corticosteroid inhalers
- only using a reliever inhaler to manage their symptoms
- not ordering their preventer inhalers

We recommend that people should be seen for a priority review if they are prescribed six or more reliever inhalers a year.

People taking high dose inhaled corticosteroids should be given a steroid safety card. And if the dose of inhaled corticosteroids needs to be reduced, this should be decreased by approximately a quarter to a half, every three months.

Review montelukast 4 to 8 weeks following initiation to ensure that there has been a response and that it is still required.

Question 2a
Do you agree with this recommendation?
(Yes/No/Not sure)

Question 2b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 2c
Please tell us more about your views on our recommendations for treatment of adults with asthma:

3. For adults with severe asthma:

Identify patients with severe asthma and where modifiable risk factors are addressed and asthma care remains suboptimal, refer to secondary care for treatment optimisation.

Question 3a
Do you agree with this recommendation?
(Yes/No/Not sure)

Question 3b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 3c
Please tell us more about your views on our recommendations for treatment of adults with severe asthma:

4. For people with chronic obstructive pulmonary disease (COPD)

We recommend:

- review patients following initiation of inhaled corticosteroids (ICS) and stop if there is insufficient response or adverse effects.
- mucolytic therapy (a medicine to break up phlegm) should be reviewed four weeks after commencing therapy and should be stopped if symptoms have not improved with use.
- regular review of mucolytic therapy during the annual COPD review should be undertaken and may be stopped if there is no productive cough.
- review patients on separate long-acting muscarinic antagonist (LAMA) and long-acting beta-2 agonist (LABA) or ICS inhalers and, if appropriate change to triple therapy inhalers. Recommend review to assess benefit, discontinuing the ICS if there is no improvement.

Question 4a
Do you agree with these recommendations?
(Yes/No/Not sure)

Question 4b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 4c
Please tell us more about your views on our recommendations for treatment for people with chronic obstructive pulmonary disease (COPD):

5. For people with bronchiectasis:

We recommend that:

- people taking mucolytics should have a review every six months to determine how well the medicine is working.
- antibiotics for acute exacerbations should be selected based on positive sputum cultures where possible.

Question 5a
Do you agree with this recommendation?
(Yes/No/Not sure)

Question 5b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 5c
Please tell us more about your views on our recommendations for treatment of people with bronchiectasis:

6. For people with Idiopathic Pulmonary Fibrosis (IPF):

We recommend that antifibrotics should only be prescribed:

- by a clinician with experience of treating IPF; and
- when there is confirmed fibrotic lung disease with evidence of physiological progression.

Question 6a
Do you agree with this recommendation?
(Yes/No/Not sure)

Question 6b
To what extent do you think this recommendation will be effective in improving patient care, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 6c
Please tell us more about your views on our recommendations for treatment of people with Idiopathic Pulmonary Fibrosis (IPF):

7. Wider considerations

The healthcare industry is increasingly asked to account for the negative environmental impact generated through providing medical care. Regular medication reviews to address inappropriate polypharmacy in respiratory conditions and other co-morbidities (when a person has more than one disease or condition at the same time) should ensure that the environmental impact of prescribing is reduced.

Environmental impact of inhalers is a key consideration. Prescribers are asked to consider inhalers with a lower global warming potential where it is appropriate for the patient.

The guide sets out the following general considerations which will help reduce the environmental impact of inhaler use:

a) promote patient reviews to optimise disease control and reduce inappropriate prescribing of inhalers
b) prioritise review of patients with asthma who are over-reliant on SABA inhalers, defined as ordering more than three inhalers per year
c) streamline devices for patients, avoiding mixed device use where possible
d) review separate inhalers where a combination inhaler device would be possible
e) update local formularies to highlight and promote inhalers which have lower CO2 emissions
f) raise local public awareness to promote improvements in asthma care and the environmental impact of respiratory prescribing
g) utilise resources to support environmentally friendly prescribing

Question 7a
Do you agree with these recommendations?
(Yes/No/Not sure)

Question 7b
To what extent do you think this recommendation will be effective, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 7c
Please tell us more about your views on how best to support environmentally friendly prescribing:

8. The guide recommends the following when prescribing for new and existing patients:

a. Where appropriate, prescribe inhalers with low global warming potential when they are equally effective.
b. Review patients prescribed SABA alone, check diagnosis and if appropriate consider a DPI.
c. Consider switching to dry powder inhalers, after a person-centred medication review, for patients with asthma who have:
    - an adequate inspiratory flow (e.g. use an In-Check® device)
    - been stable for many years
    - had no asthma attack for two years
    - never been admitted to hospital /ITU
    - not been admitted under secondary care.

Question 8a
Do you agree with these recommendations?
(Yes/No/Not sure)

Question 8b
To what extent do you think this recommendation will be effective, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 8c
Please tell us more about your views on our recommendations for considering prescribing inhalers with low global warming potential to new and existing patients:

9. CO2 emissions in Scotland

An ambitious target of 70% reduction in CO2 emissions from inhalers by 2028 has been set, as NHS Scotland works towards the commitment of net-zero emissions by 2040. The 70% reduction has been split into biennial targets as follows:

- a 25% reduction of CO2 emissions is required by the end of 2024
- a 50% reduction of CO2 emissions is required by 2026 and
- a 70% reduction by end of 2028

Question 9a
Do you agree with these recommendations?
(Yes/No/Not sure)

Question 9b
To what extent do you think this recommendation will be effective, on a scale of 1-5, where 1 is not effective at all and 5 is extremely effective?

Question 9c
Please tell us more about your response. For example, how do you feel about the percentage reduction from 25% to 50% to 70%, over the time period up to 2028?

10. Resources for further information

Resource	
NHS Inform	Lungs and airways | NHS inform has information on the symptoms, causes and treatment for a range of respiratory illnesses.
My Lungs My Life	My Lungs My Life is a comprehensive, free website for anyone living with COPD, asthma or for parents/guardians of children with asthma. The resource is a collaboration between NHS, third sector and the University of Edinburgh.
Don't Waste a Breath	The Don't Waste a Breath website, developed by NHS Grampian, provides information for patients on inhaler technique and how to recycle inhalers. This website complements My Lungs My Life.
Charity Resources	The Chest Heart and Stroke Scotland and Asthma + Lung UK | Asthma home have lots of information to support patients including patient leaflets, booklets and toolkits and both have a patient helpline providing advice.
Personal Asthma Action Plans	There is substantial evidence to support the value of personalised actions plans for asthma in both adults and children. Access a generic template from Asthma + Lung UK.

Question 10a
Are you aware of any other resources that people with respiratory conditions may find useful?
(Yes/No/Not sure)

Question 10b
If your answer to question 10a was Yes, please list any other resources that you are aware of:

11. Implementation of this guidance

We have a few questions, which will help us implement the recommendations from this prescribing guide.

Question 11a

Do you feel there are any barriers to implementing the recommendations from this guidance?
(Yes/No/Not sure)

Question 11b

If you answered yes to Question 11a, how do you feel these barriers could be addressed?

Question 11c

What are the key factors that will enable successful implementation of these recommendations?

12. Finally

Question 12

Do you have any further comments on this prescribing guide or patient information guide?

This publication is available at **www.gov.scot**

Any enquiries regarding this publication should be sent to us at

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