Asthma Update

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8th March 2023

Overview

- What is asthma?
- Assessing uncontrolled asthma
  - Why is that important?
- BSW asthma inhaler prescribing guideline
  - How it aligns to the BTS/NICE guidelines
  - Environmental considerations
- Summary

Asthma definition

- A **chronic** inflammatory disease characterised by **reversible** airflow obstruction

- No single diagnostic test
- Clinical assessment backed up by objective tests

Asthma vs COPD

	Asthma	COPD
Smoking history	Possibly	Inevitably
Family history	Common	Infrequent
Atopy	Common	Infrequent
Age on onset <40	Common	Extremely rare
Breathlessness	Variable	Persistent & progressive
Nocturnal symptoms	Common	Rare
Cough	Dry – nocturnal or exertional	Productive – early morning

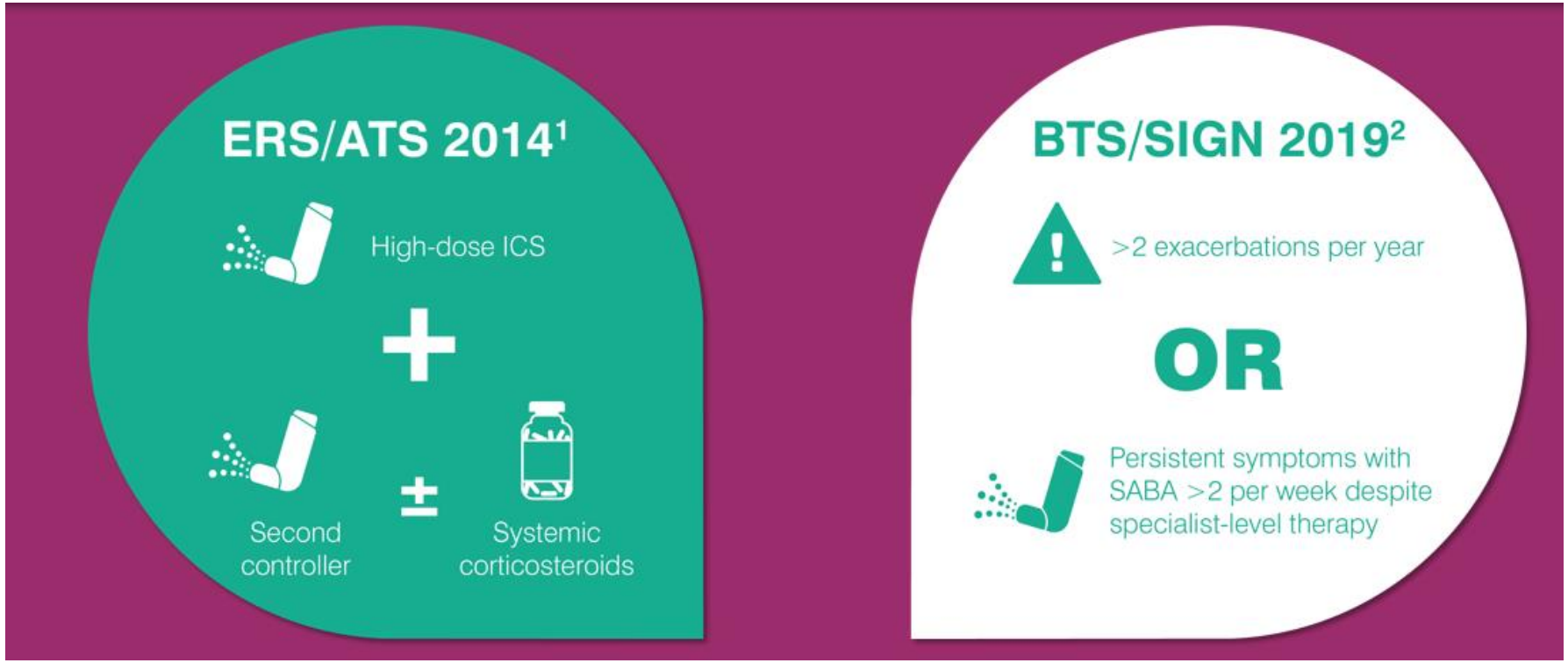
BTS/SIGN Asthma guideline 2019

Asthma in the UK

- 5.4 million people in UK receiving asthma treatment
  - 4.3 million adults and 1.1 million children
- Prevalence of asthma 6-10% in South West
  - About 500,000 people across the region
- Severe asthma makes up 5% of asthmatics
  - About 200 people in RUH catchment

British Lung Foundation. Asthma Statistics. Available at: https://statistics.blf.org.uk/asthma
Asthma + Lung UK. What is severe asthma? Available at: https://www.asthma.org.uk/advice/severe-asthma/what-is-severe-asthma/

What is severe asthma?



1. Chung KF et al Eur Respir J 2014; 43(2):343-373.
2. 2. BTS/SIGN British guideline on the management of asthma [online] 2019. Available from: https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/

ICS = inhaled corticosteroids; SABA = short-acting beta 2 agonist

Asthma in the UK cont…

- Average about 6,000 emergency admissions per month across UK (2015-16)
- >£1 billion spend on asthma/yr
  - £700 million/yr in drug costs alone
- 1,481 asthma deaths in UK (2020)
  - About 70% in >75 yrs age group

Asthma + Lung UK. Asthma data visualisations. Available at: https://www.asthma.org.uk/support-us/campaigns/data-visualisations/

National Review of Asthma Deaths

- In the National Review of Asthma Deaths (where severity could be estimated):
  - 9% (n=14/155) had mild asthma
  - 49% (n=76/155) had moderate asthma

'It is likely that many patients who were treated as having mild or moderate asthma had poorly controlled undertreated asthma'

  - 39% (n=61/155) of patients had severe asthma

Levy ML et al. (2014) Why asthma still kills: The National Review of Asthma Deaths (NRAD) – Confidential Enquiry report. RCP

Uncontrolled asthma - Effect on patients

Can't undertake daily activities

Anxiety, depression and anger

Time off work/study

Exacerbations

Impact of Oral Corticosteroids

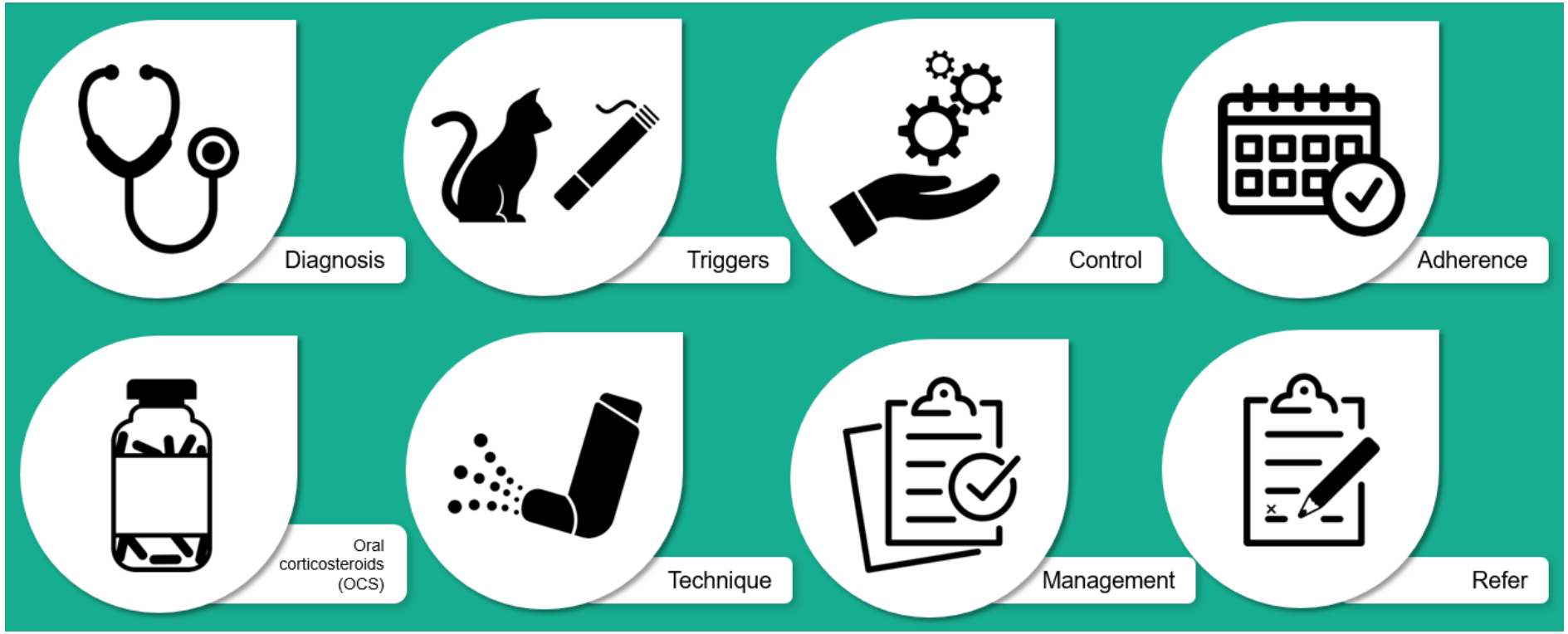
- Oral corticosteroids can be life saving for acute asthma attacks
- **BUT**… repeated use of oral steroids can have devastating long-term consequences for people with asthma

- Impact of long-term OCS use versus non-use in asthma patients:
  - 3.4 fold increase in the likelihood of experiencing significant symptoms of depression[(1)]
  - 2.6 fold increase in coronary heart disease [(2)]
  - 2.6 fold increase in all-cause mortality risk [(2)]

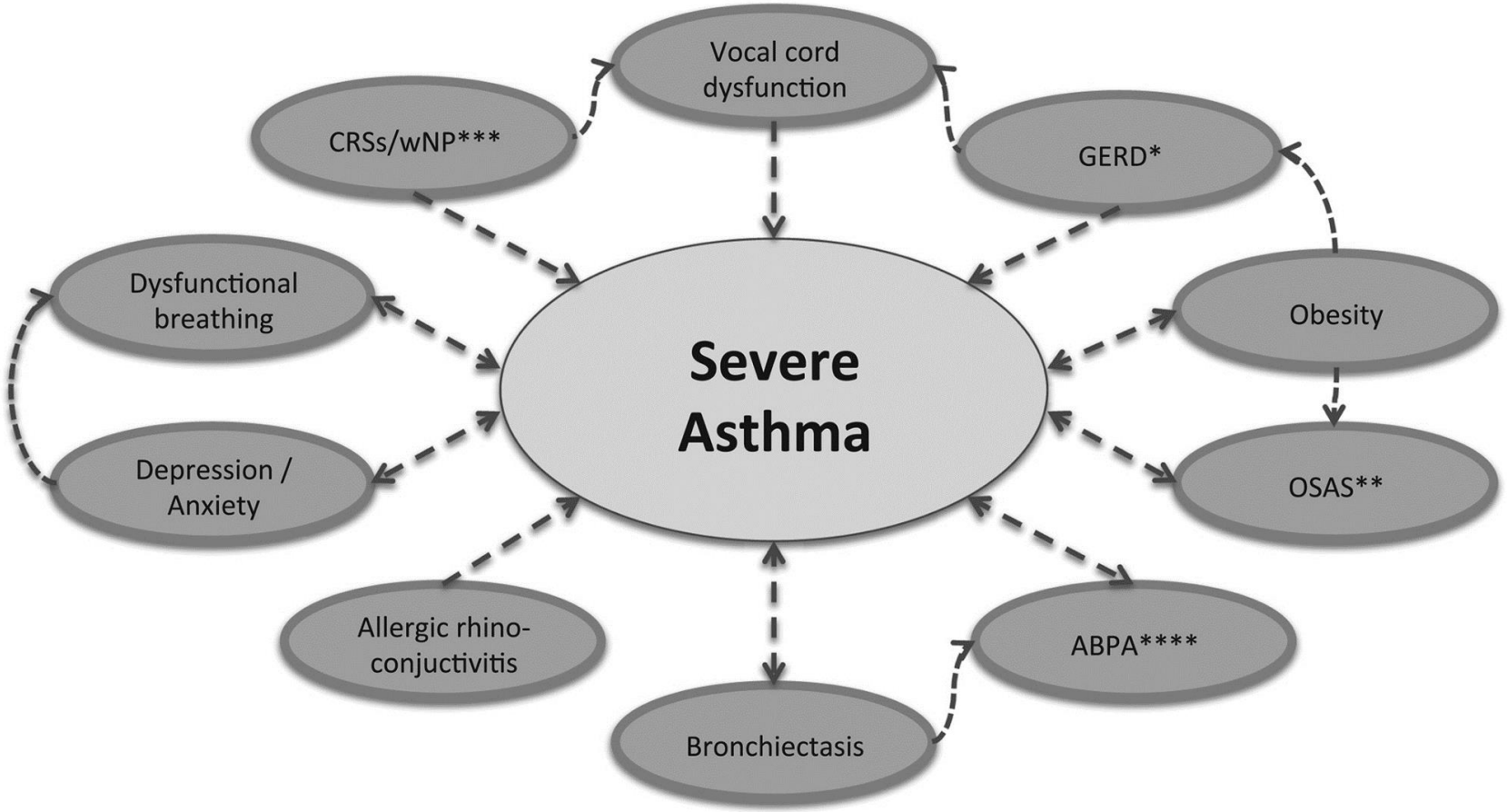
- Patients prescribed long term OCS have higher rates of:
  - Osteoporosis [(3)]
  - Diabetes [(3)]
  - Fractures [(3)]
  - Pneumonia [(3)]

1. *Amelink M et al (2014) Resp Med. 108:438–444.*
2. *2. Iribarren C et al (2012) Am J Epidemiol. 176:1014–1024.*
3. *3. Price D (2018) J Asthma Allergy 11:193-204*

Assessing uncontrolled asthma

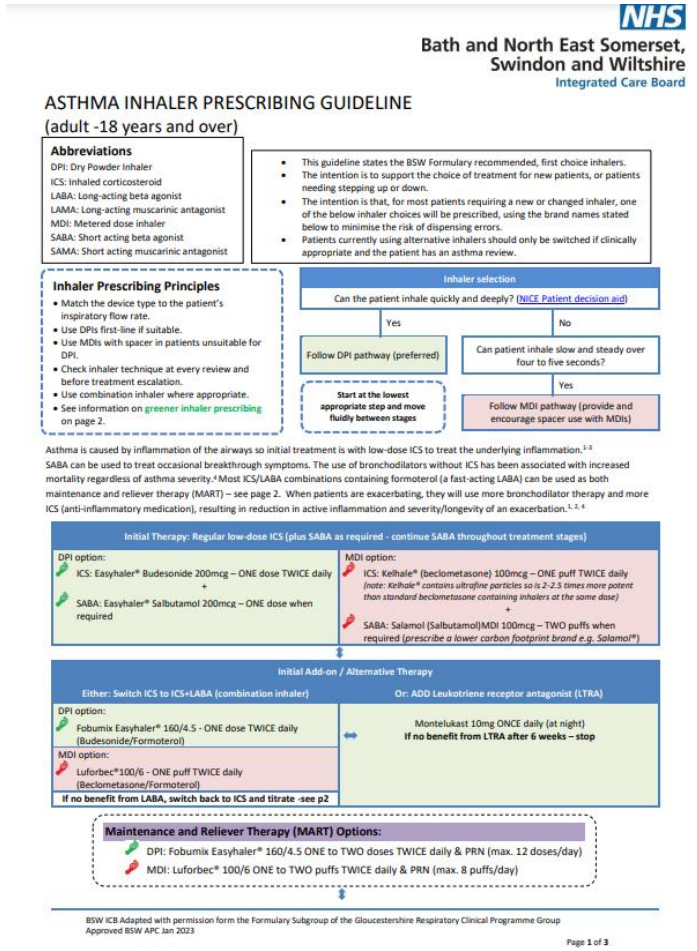


Interaction of co-morbidities



ABPA, allergic bronchopulmonary aspergillosis; CRSsNP, chronic rhinosinusitis (CRS) without nasal polyps; CRSwNP, CRS with nasal polyps.
Porsbjerg C, Menzies-Gow A. *Respirology* 2017; 22(4):651-61.

New BSW asthma inhaler guide



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ASTHMA INHALER PRESCRIBING GUIDELINE
(adult -18 years and over)

Abbreviations
DPI: Dry Powder Inhaler
ICS: Inhaled corticosteroid
LABA: Long-acting beta agonist
LAMA: Long-acting muscarinic antagonist
MDI: Metered dose inhaler
SABA: Short acting beta agonist
SAMA: Short acting muscarinic antagonist

- This guideline states the BSW Formulary recommended, first choice inhalers.
- The intention is to support the choice of treatment for new patients, or patients needing stepping up or down.
- The intention is that, for most patients requiring a new or changed inhaler, one of the below inhaler choices will be prescribed, using the brand names stated below to minimise the risk of dispensing errors.
- Patients currently using alternative inhalers should only be switched if clinically appropriate and the patient has an asthma review.

Inhaler Prescribing Principles
- Match the device type to the patient's inspiratory flow rate.
- Use DPIs first-line if suitable.
- Use MDIs with spacer in patients unsuitable for DPI.
- Check inhaler technique at every review and before treatment escalation.
- Use combination inhaler where appropriate.
- See information on greener inhaler prescribing on page 2.

Inhaler selection
Can the patient inhale quickly and deeply? (NICE Patient decision aid)
Yes → Follow DPI pathway (preferred)
No → Can patient inhale slow and steady over four to five seconds?
Yes → Follow MDI pathway (provide and encourage spacer use with MDIs)
Start at the lowest appropriate step and move fluidly between stages

Asthma is caused by inflammation of the airways so initial treatment is with low-dose ICS to treat the underlying inflammation.[1-3] SABA can be used to treat occasional breakthrough symptoms. The use of bronchodilators without ICS has been associated with increased mortality regardless of asthma severity.[4] Most ICS/LABA combinations containing formoterol (a fast-acting LABA) can be used as both maintenance and reliever therapy (MART) – see page 2. When patients are exacerbating, they will use more bronchodilator therapy and more ICS (anti-inflammatory medication), resulting in reduction in active inflammation and severity/longevity of an exacerbation.[1, 2, 4]

Initial Therapy: Regular low-dose ICS (plus SABA as required - continue SABA throughout treatment stages)

DPI option:	MDI option:
ICS: Easyhaler® Budesonide 200mcg – ONE dose TWICE daily + SABA: Easyhaler® Salbutamol 200mcg – ONE dose when required	ICS: Kelhale® (beclometasone) 100mcg – ONE puff TWICE daily *(note: Kelhale® contains ultrafine particles so is 2-2.5 times more potent than standard beclometasone containing inhalers at the same dose)* + SABA: Salamol (Salbutamol)MDI 100mcg – TWO puffs when required (*prescribe a lower carbon footprint brand e.g. Salamol®*)

Initial Add-on / Alternative Therapy

Either: Switch ICS to ICS+LABA (combination inhaler)	Or: ADD Leukotriene receptor antagonist (LTRA)
DPI option: Fobumix Easyhaler® 160/4.5 - ONE dose TWICE daily (Budesonide/Formoterol) MDI option: Luforbec®100/6 - ONE puff TWICE daily (Beclometasone/Formoterol) **If no benefit from LABA, switch back to ICS and titrate -see p2**	Montelukast 10mg ONCE daily (at night) **If no benefit from LTRA after 6 weeks – stop**

Maintenance and Reliever Therapy (MART) Options:
DPI: Fobumix Easyhaler® 160/4.5 ONE to TWO doses TWICE daily & PRN (max. 12 doses/day)
MDI: Luforbec® 100/6 ONE to TWO puffs TWICE daily & PRN (max. 8 puffs/day)

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Approved BSW APC Jan 2023

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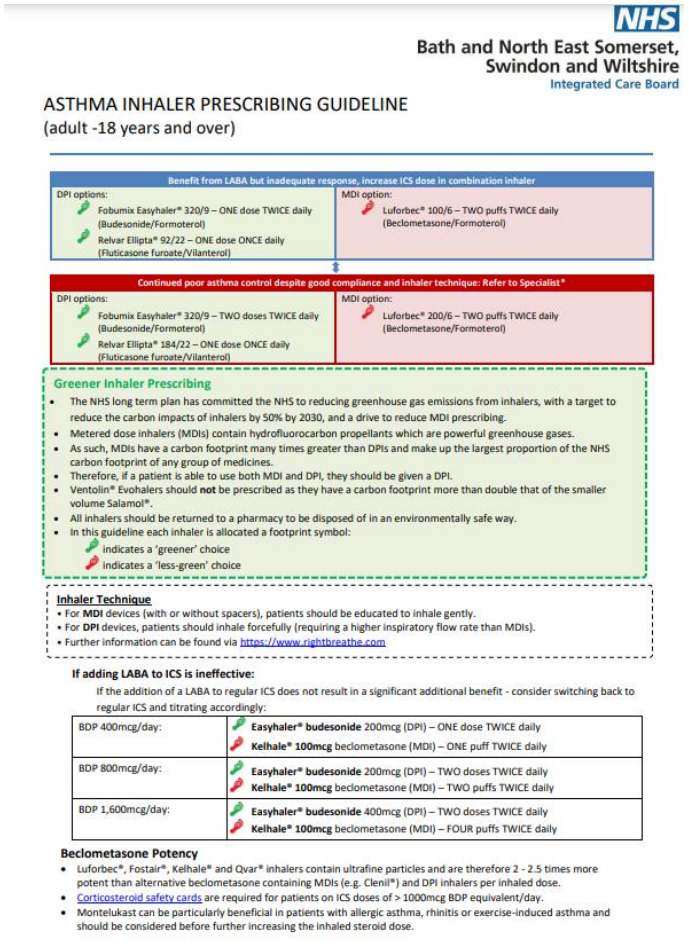

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(adult -18 years and over)

Benefit from LABA but inadequate response, increase ICS dose in combination inhaler

DPI options:	MDI option:
Fobumix Easyhaler® 320/9 – ONE dose TWICE daily (Budesonide/Formoterol) Relvar Ellipta® 92/22 – ONE dose ONCE daily (Fluticasone furoate/Vilanterol)	Luforbec® 100/6 – TWO puffs TWICE daily (Beclometasone/Formoterol)

Continued poor asthma control despite good compliance and inhaler technique: Refer to Specialist*

DPI options:	MDI option:
Fobumix Easyhaler® 320/9 – TWO doses TWICE daily (Budesonide/Formoterol) Relvar Ellipta® 184/22 – ONE dose ONCE daily (Fluticasone furoate/Vilanterol)	Luforbec® 200/6 – TWO puffs TWICE daily (Beclometasone/Formoterol)

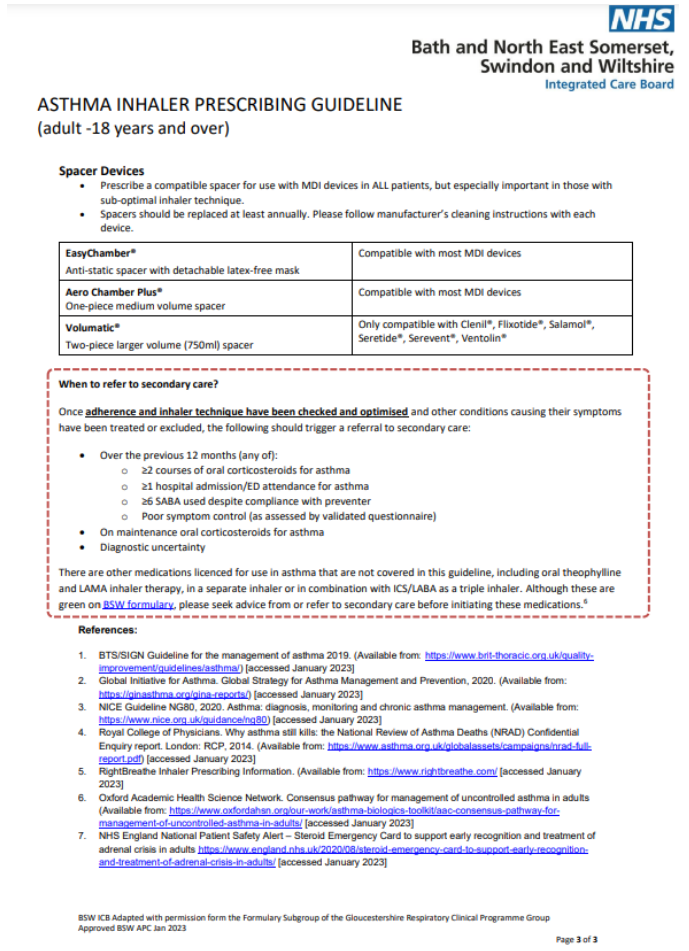
Greener Inhaler Prescribing
- The NHS long term plan has committed the NHS to reducing greenhouse gas emissions from inhalers, with a target to reduce the carbon impacts of inhalers by 50% by 2030, and a drive to reduce MDI prescribing.
- Metered dose inhalers (MDIs) contain hydrofluorocarbon propellants which are powerful greenhouse gases.
- As such, MDIs have a carbon footprint many times greater than DPIs and make up the largest proportion of the NHS carbon footprint of any group of medicines.
- Therefore, if a patient is able to use both MDI and DPI, they should be given a DPI.
- Ventolin® Evohalers should **not** be prescribed as they have a carbon footprint more than double that of the smaller volume Salamol®.
- All inhalers should be returned to a pharmacy to be disposed of in an environmentally safe way.
- In this guideline each inhaler is allocated a footprint symbol:
  - indicates a 'greener' choice
  - indicates a 'less-green' choice

Inhaler Technique
- For **MDI** devices (with or without spacers), patients should be educated to inhale gently.
- For **DPI** devices, patients should inhale forcefully (requiring a higher inspiratory flow rate than MDIs).
- Further information can be found via https://www.rightbreathe.com

If adding LABA to ICS is ineffective:
If the addition of a LABA to regular ICS does not result in a significant additional benefit - consider switching back to regular ICS and titrating accordingly:

BDP 400mcg/day:	**Easyhaler® budesonide** 200mcg (DPI) – ONE dose TWICE daily **Kelhale® 100mcg** beclometasone (MDI) – ONE puff TWICE daily
BDP 800mcg/day:	**Easyhaler® budesonide** 200mcg (DPI) – TWO doses TWICE daily **Kelhale® 100mcg** beclometasone (MDI) – TWO puffs TWICE daily
BDP 1,600mcg/day:	**Easyhaler® budesonide** 400mcg (DPI) – TWO doses TWICE daily **Kelhale® 100mcg** beclometasone (MDI) – FOUR puffs TWICE daily

Beclometasone Potency
- Luforbec®, Fostair®, Kelhale® and Qvar® inhalers contain ultrafine particles and are therefore 2 - 2.5 times more potent than alternative beclometasone containing MDIs (e.g. Clenil®) and DPI inhalers per inhaled dose.
- Corticosteroid safety cards are required for patients on ICS doses of > 1000mcg BDP equivalent/day.
- Montelukast can be particularly beneficial in patients with allergic asthma, rhinitis or exercise-induced asthma and should be considered before further increasing the inhaled steroid dose.



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Spacer Devices
- Prescribe a compatible spacer for use with MDI devices in ALL patients, but especially important in those with sub-optimal inhaler technique.
- Spacers should be replaced at least annually. Please follow manufacturer's cleaning instructions with each device.

EasyChamber® Anti-static spacer with detachable latex-free mask	Compatible with most MDI devices
Aero Chamber Plus® One-piece medium volume spacer	Compatible with most MDI devices
Volumatic® Two-piece larger volume (750ml) spacer	Only compatible with Clenil®, Flixotide®, Salamol®, Seretide®, Serevent®, Ventolin®

When to refer to secondary care?

Once **adherence and inhaler technique have been checked and optimised** and other conditions causing their symptoms have been treated or excluded, the following should trigger a referral to secondary care:

- Over the previous 12 months (any of):
  - ≥2 courses of oral corticosteroids for asthma
  - ≥1 hospital admission/ED attendance for asthma
  - ≥6 SABA used despite compliance with preventer
  - Poor symptom control (as assessed by validated questionnaire)
- On maintenance oral corticosteroids for asthma
- Diagnostic uncertainty

There are other medications licenced for use in asthma that are not covered in this guideline, including oral theophylline and LAMA inhaler therapy, in a separate inhaler or in combination with ICS/LABA as a triple inhaler. Although these are green on BSW formulary, please seek advice from or refer to secondary care before initiating these medications.[5]

References:

1. BTS/SIGN Guideline for the management of asthma 2019. (Available from: https://www.brit-thoracic.org.uk/quality-improvement/guidelines/asthma/) [accessed January 2023]
2. Global Initiative for Asthma. Global Strategy for Asthma Management and Prevention, 2020. (Available from: https://ginasthma.org/gina-reports/) [accessed January 2023]
3. NICE Guideline NG80, 2020. Asthma: diagnosis, monitoring and chronic asthma management. (Available from: https://www.nice.org.uk/guidance/ng80) [accessed January 2023]
4. Royal College of Physicians. Why asthma still kills: the National Review of Asthma Deaths (NRAD) Confidential Enquiry report. London: RCP, 2014. (Available from: https://www.asthma.org.uk/globalassets/campaigns/nrad-full-report.pdf) [accessed January 2023]
5. RightBreathe Inhaler Prescribing Information. (Available from: https://www.rightbreathe.com/ [accessed January 2023]
6. Oxford Academic Health Science Network. Consensus pathway for management of uncontrolled asthma in adults (Available from: https://www.oxfordahsn.org/our-work/asthma-biologics-toolkit/aac-consensus-pathway-for-management-of-uncontrolled-asthma-in-adults/ [accessed January 2023]
7. NHS England National Patient Safety Alert – Steroid Emergency Card to support early recognition and treatment of adrenal crisis in adults https://www.england.nhs.uk/2020/08/steroid-emergency-card-to-support-early-recognition-and-treatment-of-adrenal-crisis-in-adults/ [accessed January 2023]

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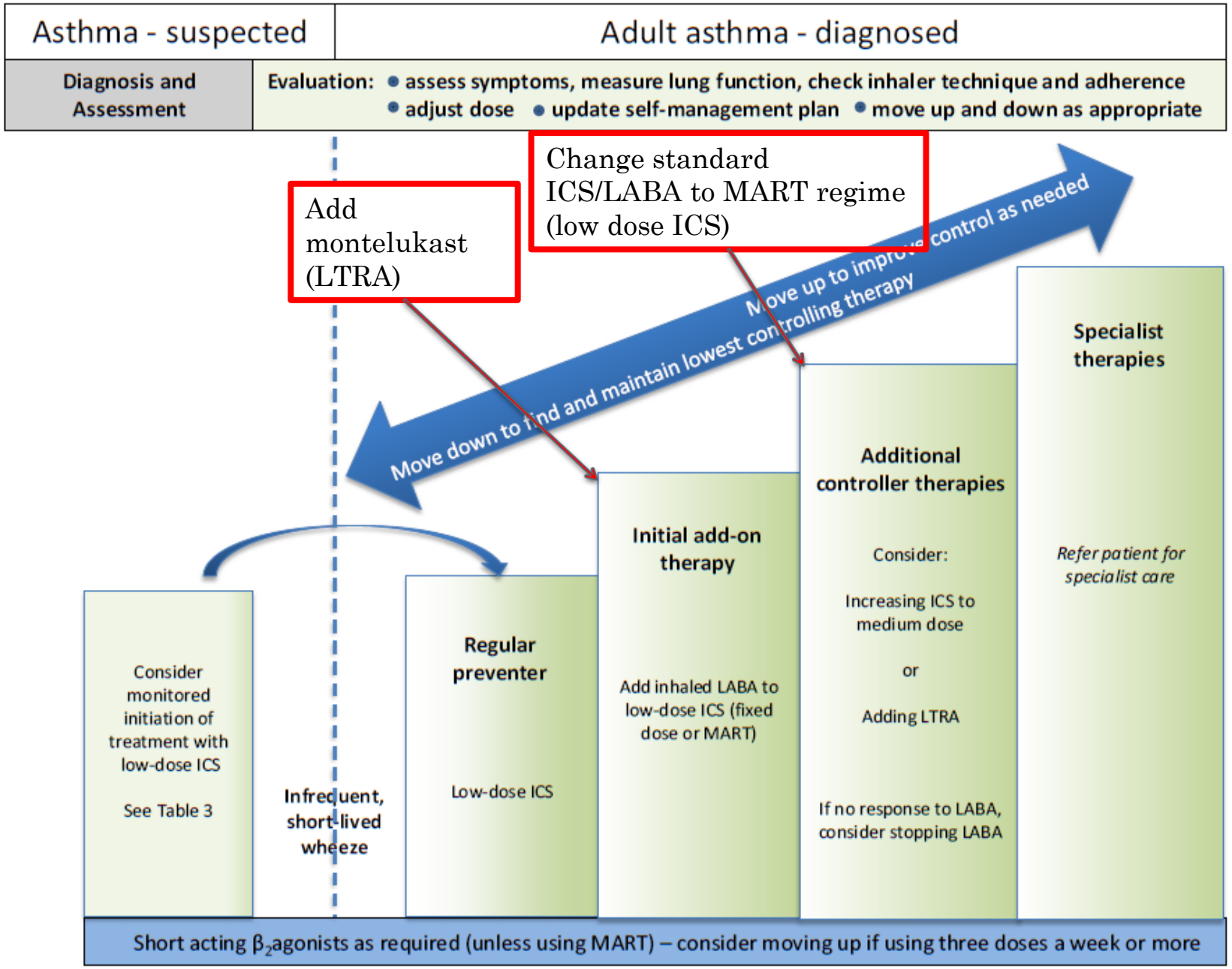
https://bswtogether.org.uk/medicines/wp-content/uploads/sites/3/2023/01/BSW-Asthma-Inhaler-Prescribing-Guidance-in-Adults-Jan-2023-1.pdf



NICE National Institute for Health and Care Excellence Guideline Nov 2017

BTS/SIGN Asthma Guideline 2019

Choose the right *device* for your patient

Inhaler Prescribing Principles

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- Use DPIs first-line if suitable.
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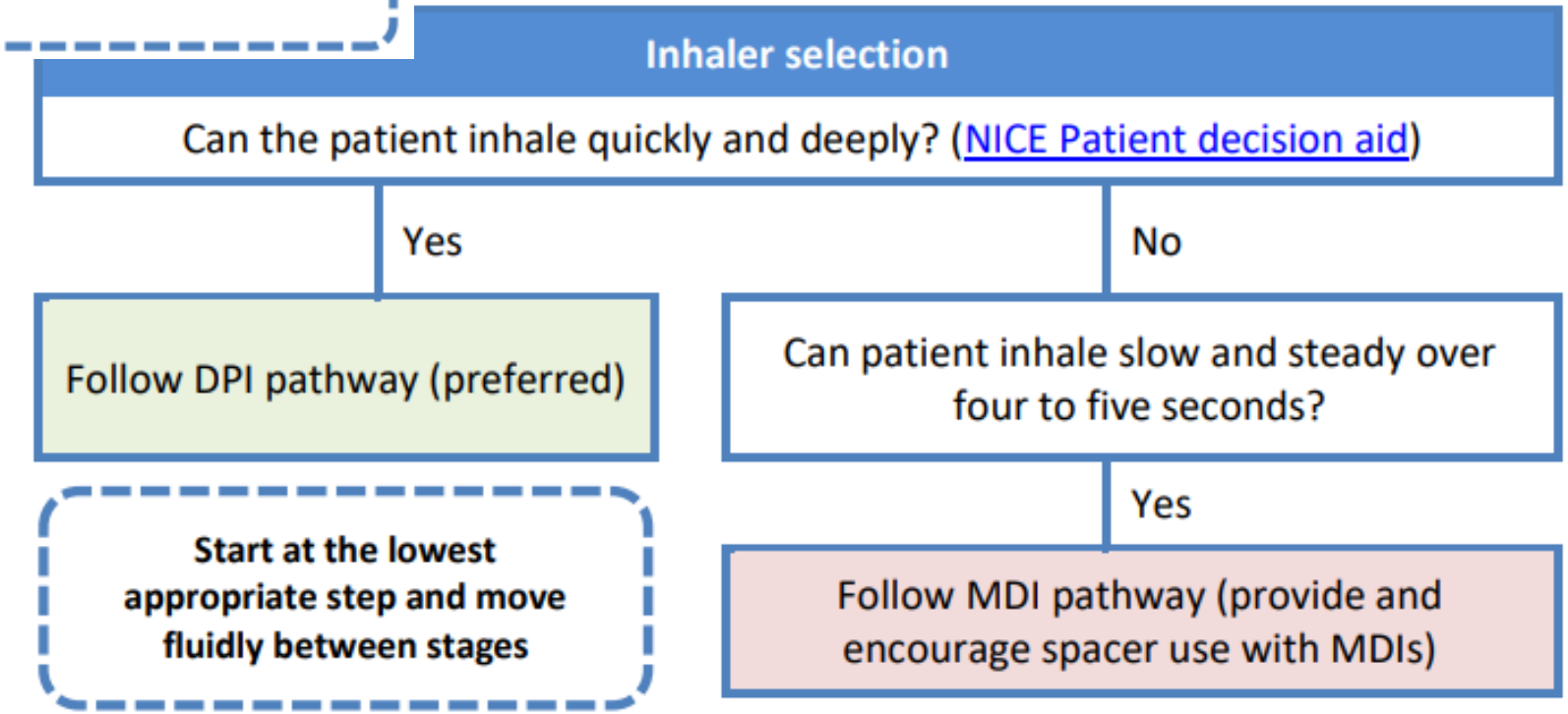
- Use combination inhaler where appropriate.
- See information on **greener inhaler prescribing** on page 2.



Environmental impact of inhalers

Greener Inhaler Prescribing

- The NHS long term plan has committed the NHS to reducing greenhouse gas emissions from inhalers, with a target to reduce the carbon impacts of inhalers by 50% by 2030, and a drive to reduce MDI prescribing.
- Metered dose inhalers (MDIs) contain hydrofluorocarbon propellants which are powerful greenhouse gases.
- As such, MDIs have a carbon footprint many times greater than DPIs and make up the largest proportion of the NHS carbon footprint of any group of medicines.
- Therefore, if a patient is able to use both MDI and DPI, they should be given a DPI.
- Ventolin® Evohalers should **not** be prescribed as they have a carbon footprint more than double that of the smaller volume Salamol®.
- All inhalers should be returned to a pharmacy to be disposed of in an environmentally safe way.
- In this guideline each inhaler is allocated a footprint symbol:
  -  indicates a 'greener' choice
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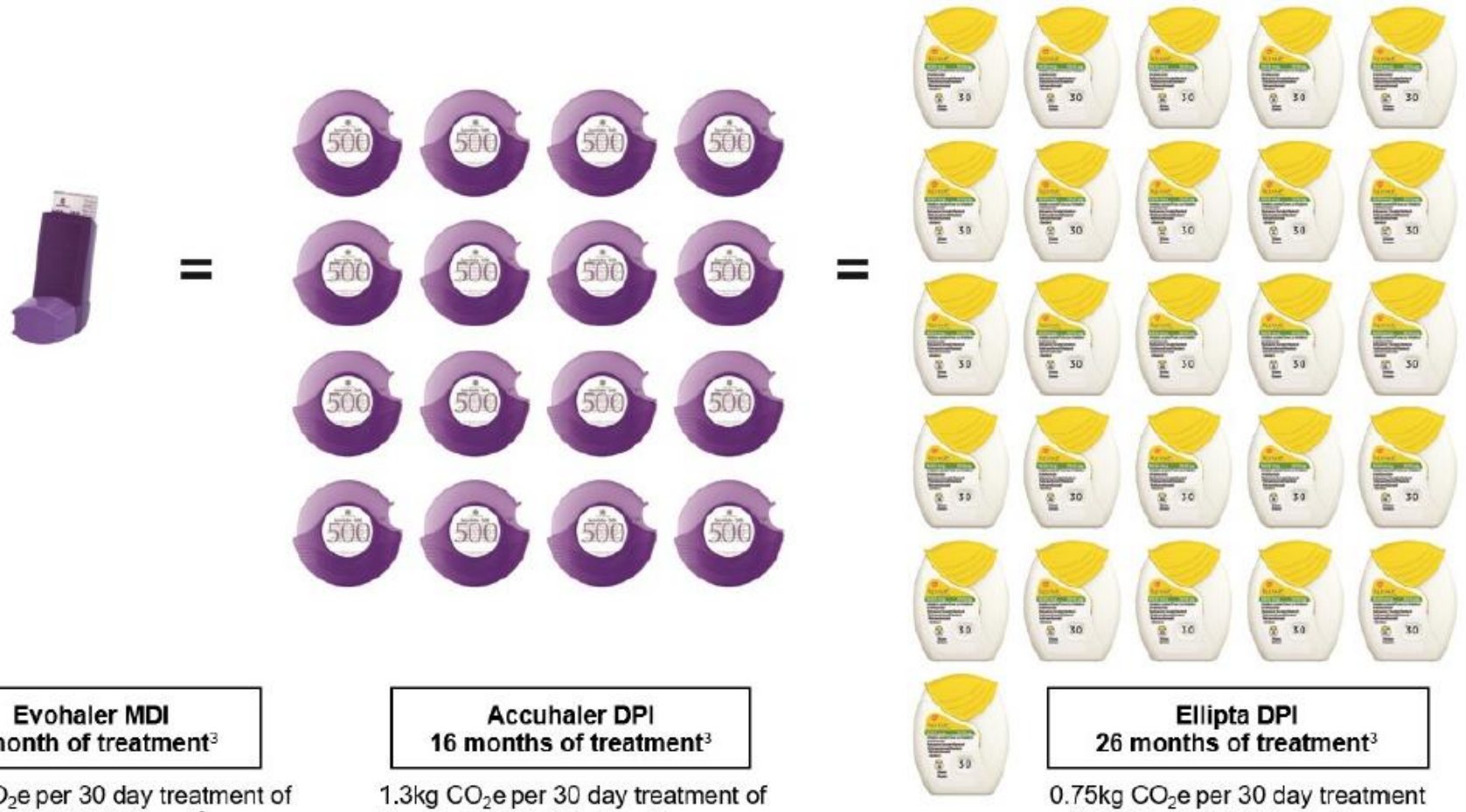
Environmental Impact



Evohaler MDI
1 month of treatment[3]

20kg CO_2e per 30 day treatment of Evohaler MDI (120 doses)[3]

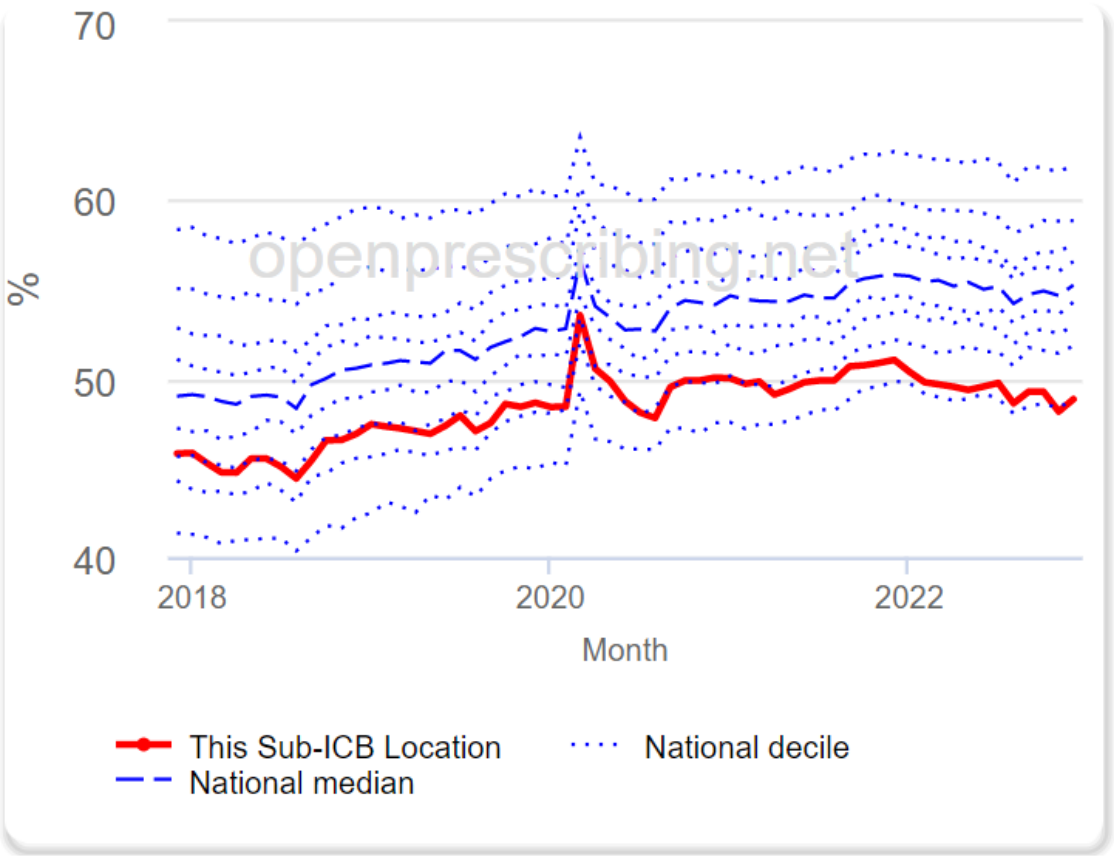
Accuhaler DPI
16 months of treatment[3]

1.3kg CO_2e per 30 day treatment of Accuhaler DPI (60 doses)[3]

Ellipta DPI
26 months of treatment[3]

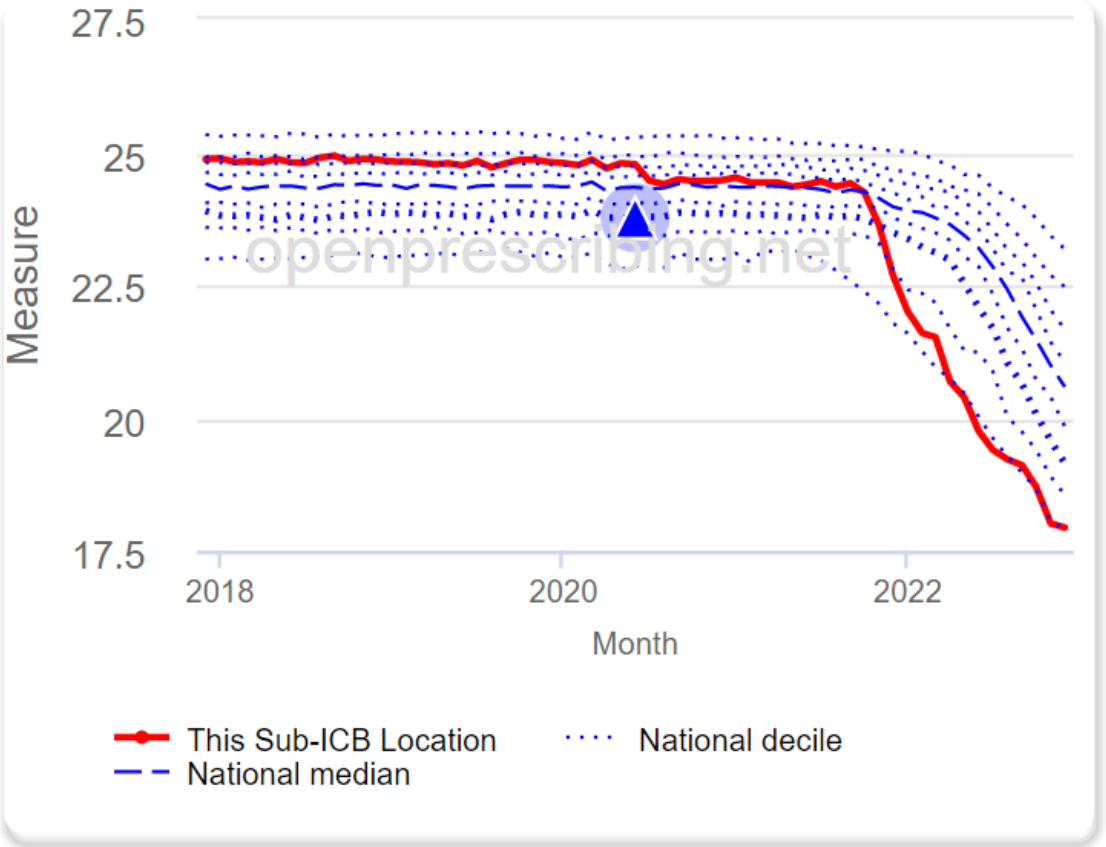
0.75kg CO_2e per 30 day treatment with Ellipta DPI (30 doses)[3]

MDIs prescribed as a proportion of all inhalers in BNF Chapter 3, excluding salbutamol



BSW data compared to the rest of England

Mean carbon impact (kg CO_2e) per salbutamol inhaler prescribed



https://openprescribing.net/sicbl/92G/measures/?tags=respiratory

Initial Therapy: Regular low-dose ICS (plus SABA as required - continue SABA throughout treatment stages)

DPI option:

ICS: Easyhaler® Budesonide 200mcg – ONE dose TWICE daily

+

SABA: Easyhaler® Salbutamol 200mcg – ONE dose when required

MDI option:

ICS: Kelhale® (beclometasone) 100mcg – ONE puff TWICE daily

(note: Kelhale® contains ultrafine particles so is 2-2.5 times more potent than standard beclometasone containing inhalers at the same dose)

+

SABA: Salamol (Salbutamol)MDI 100mcg – TWO puffs when required (*prescribe a lower carbon footprint brand e.g. Salamol®*)

Initial Add-on / Alternative Therapy

Either: Switch ICS to ICS+LABA (combination inhaler)

DPI option:

Fobumix Easyhaler® 160/4.5 - ONE dose TWICE daily (Budesonide/Formoterol)

MDI option:

Luforbec®100/6 - ONE puff TWICE daily (Beclometasone/Formoterol)

If no benefit from LABA, switch back to ICS and titrate -see p2

Or: ADD Leukotriene receptor antagonist (LTRA)

Montelukast 10mg ONCE daily (at night)

If no benefit from LTRA after 6 weeks – stop

Maintenance and Reliever Therapy (MART) Options:

DPI: Fobumix Easyhaler® 160/4.5 ONE to TWO doses TWICE daily & PRN (max. 12 doses/day)

MDI: Luforbec® 100/6 ONE to TWO puffs TWICE daily & PRN (max. 8 puffs/day)

ICS should be considered if:

- Asthma attack in last 2 yrs
- Using SABA ≥ 3x per week
- Symptomatic ≥ 3x per week
- Waking one night a week

- Once daily ICS at the same total daily dose can be considered if evidence of good control

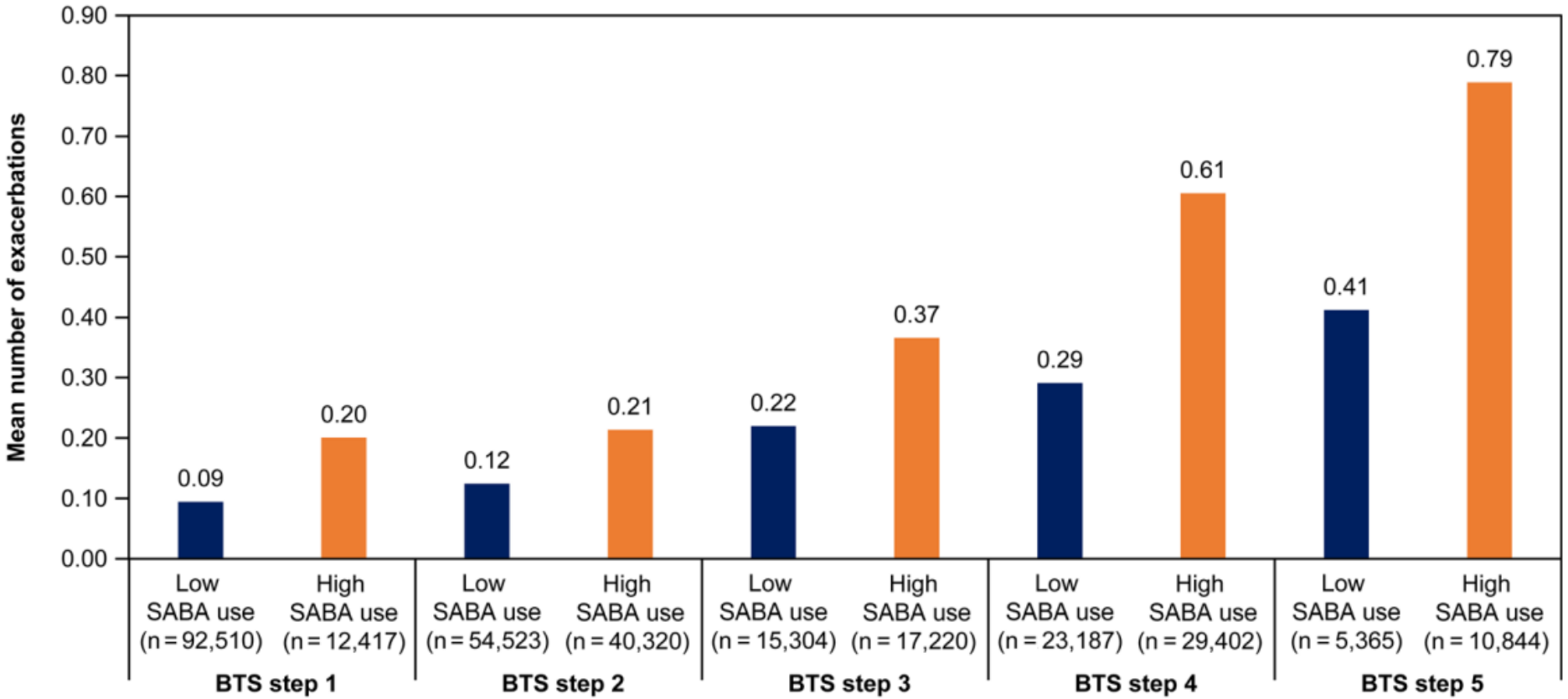
- NB. Current GINA guidance suggests prn ICS/LABA for patients with mild asthma.

Risks of SABA-only treatment

- Regular use of SABA, even for 1–2 weeks, is associated with adverse effects
  - β-receptor downregulation, decreased bronchoprotection, rebound hyperresponsiveness, decreased bronchodilator response *(Hancox, Respir Med 2000);* increased allergic response, and increased eosinophilic airway inflammation *(Aldridge, AJRCCM 2000)*
- Higher use of SABA is associated with adverse clinical outcomes
  - Dispensing of ≥3 canisters per year (i.e. daily use) is associated with higher risk of severe exacerbations *(Stanford, AAAI 2012; Nwaru, ERJ 2021)*
  - Dispensing of ≥12 canisters per year is associated with much higher risk of death *(Suissa, AJRCCM 1994; Nwaru, ERJ 2021)*
- Inhaled corticosteroids reduce the risk of asthma deaths, hospitalization and exacerbations requiring oral corticosteroids (OCS) *(Suissa, NEJM 2000 & 2002; Pauwels, Lancet 2003)*
  - BUT adherence is poor, particularly in patients with mild or infrequent symptoms

GINA 2021

About 2x exacerbation rate in patients prescribed ≥3 SABAs/year irrespective of BTS treatment step



Mean number of exacerbations in the first year of follow-up, by BTS treatment step and SABA inhaler use frequency.

Bloom C et al, Adv Ther (2020) 37:4190–4208.

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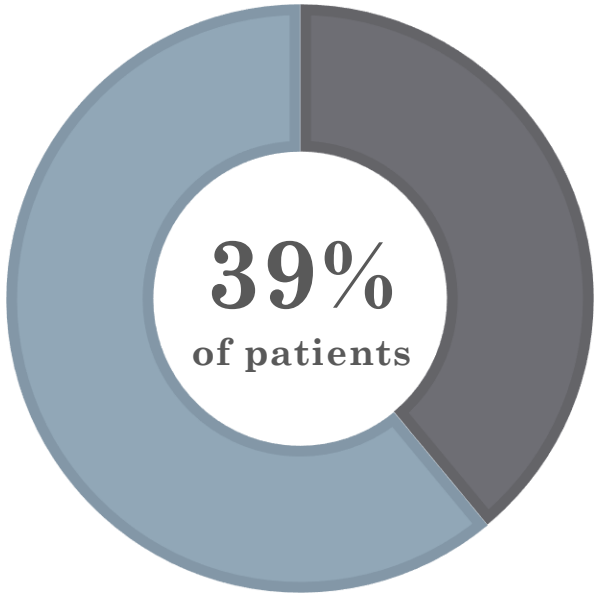
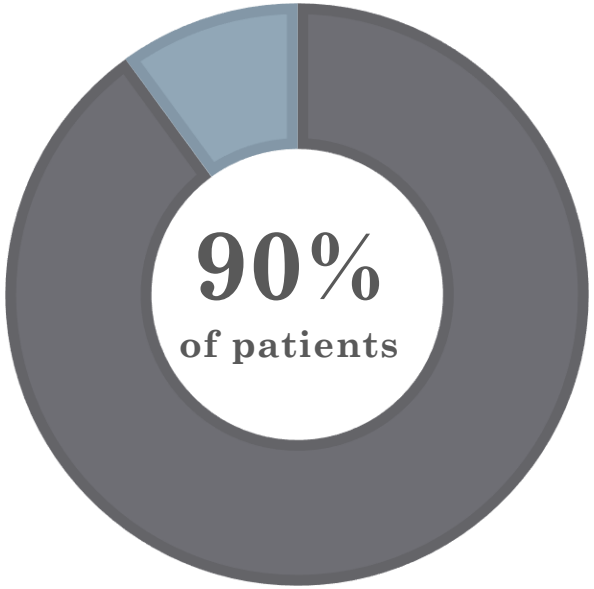
GINA 2021

Background to GINA guidance

- Patients focus on symptom relief, using SABA instead of ICS, across all severities of asthma – AIRE study, ERJ 2000
- INSPIRE study – patient attitudes to asthma management



…believe there is **no need to take preventer medication**



…want treatments that provide **immediate relief**

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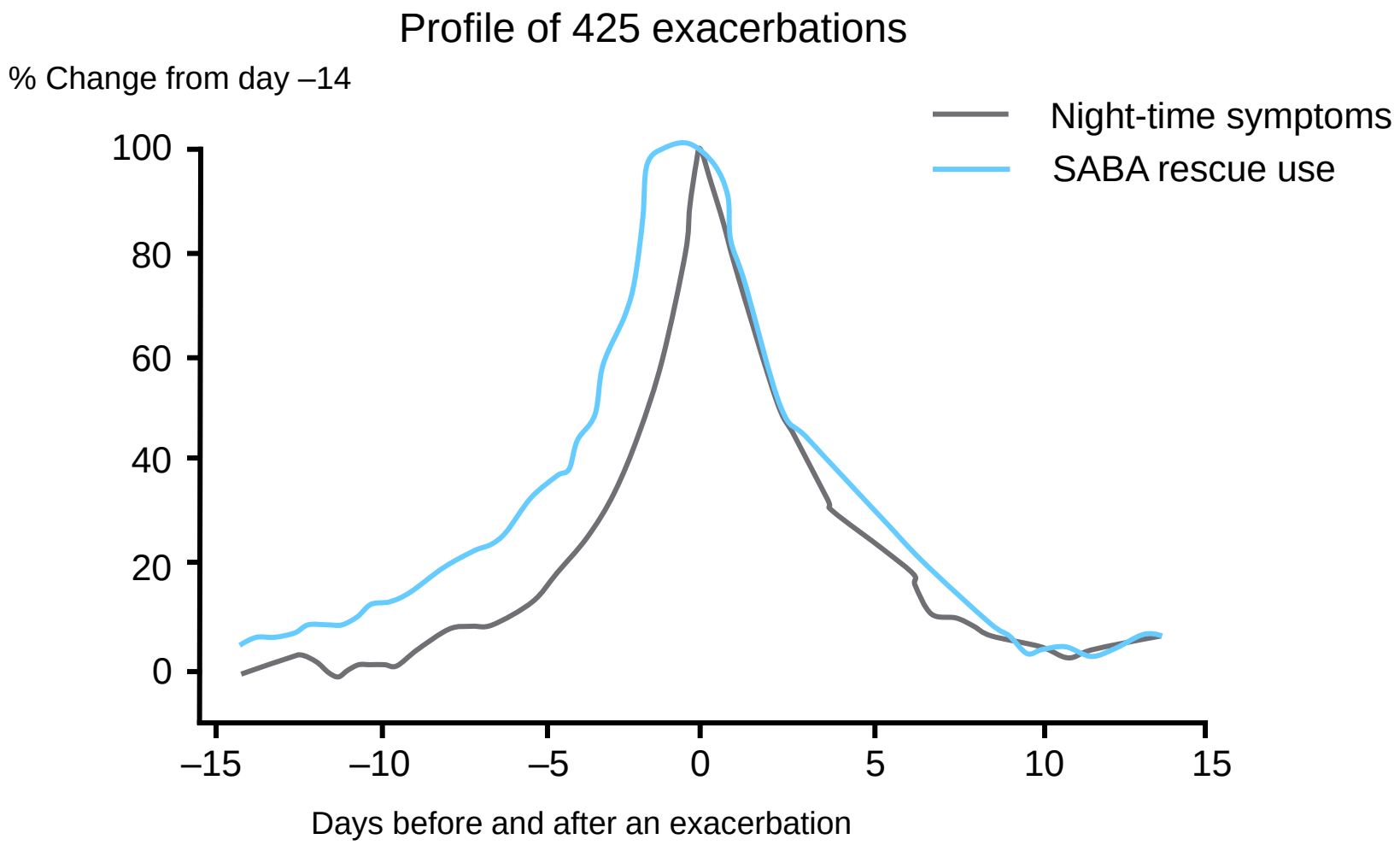
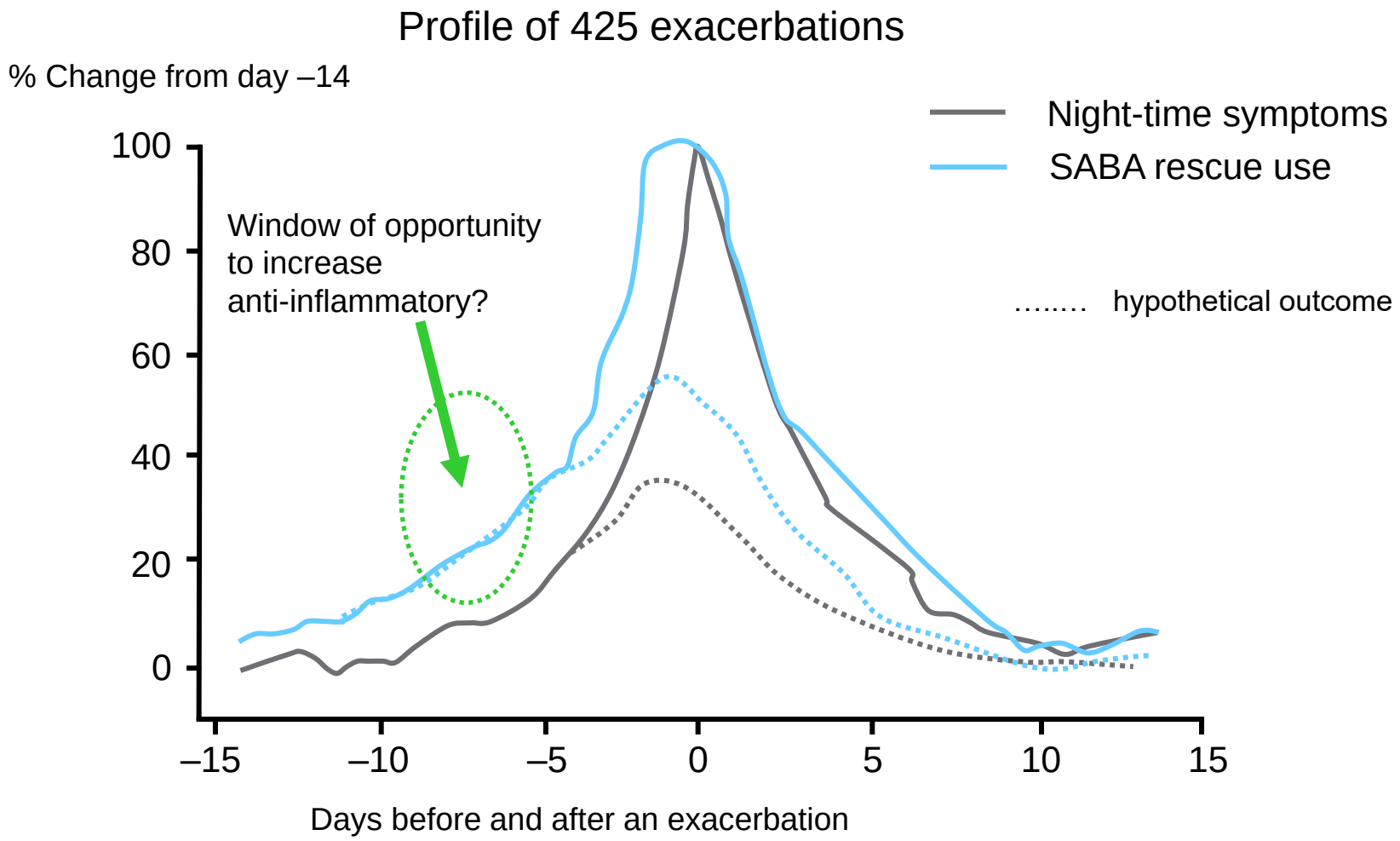
MDI: Luforbec® 100/6 ONE to TWO puffs TWICE daily & PRN (max. 8 puffs/day)

FACET: Profile of symptoms and reliever use preceeding exacerbations



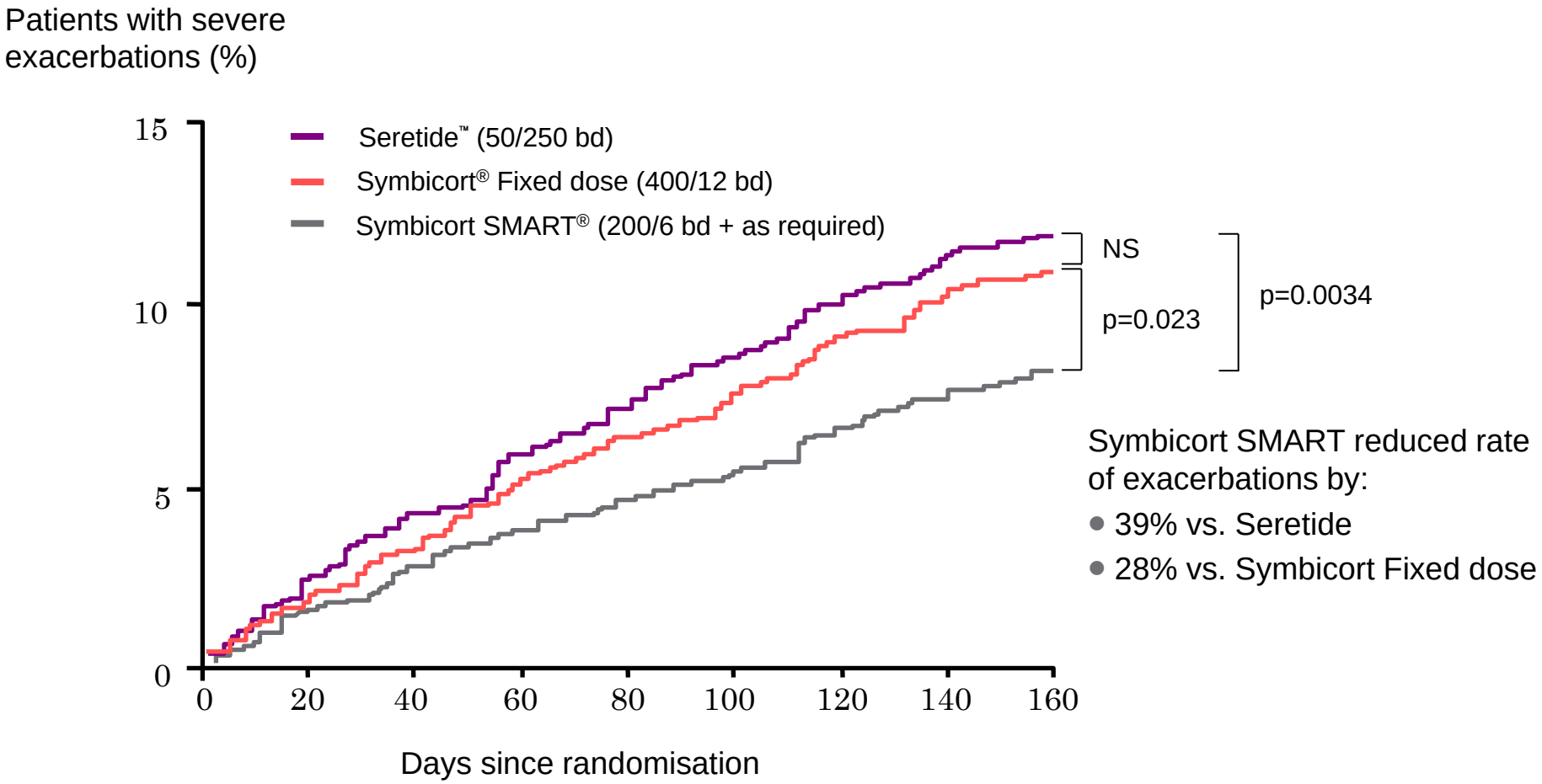
Tattersfield A *et al*. Am J Respir Crit Care Med 1999; 160:594-599

Window of opportunity to prevent exacerbations?



Adapted from Tattersfield A *et al*. Am J Respir Crit Care Med 1999; 160:594-599

Variable dosing can reduce time to 1st exacerbation



Symbicort SMART reduced rate of exacerbations by:

- 39% vs. Seretide
- 28% vs. Symbicort Fixed dose

Adapted from Kuna *et al*. Int J Clin Pract 2007; 61:5:725-736

Benefit from LABA but inadequate response, increase ICS dose in combination inhaler

DPI options:

- Fobumix Easyhaler® 320/9 – ONE dose TWICE daily (Budesonide/Formoterol)
- Relvar Ellipta® 92/22 – ONE dose ONCE daily (Fluticasone furoate/Vilanterol)

MDI option:

- Luforbec® 100/6 – TWO puffs TWICE daily (Beclometasone/Formoterol)

Continued poor asthma control despite good compliance and inhaler technique: Refer to Specialist*

DPI options:

- Fobumix Easyhaler® 320/9 – TWO doses TWICE daily (Budesonide/Formoterol)
- Relvar Ellipta® 184/22 – ONE dose ONCE daily (Fluticasone furoate/Vilanterol)

MDI option:

- Luforbec® 200/6 – TWO puffs TWICE daily (Beclometasone/Formoterol)

Other advice available

- ICS potency
- Spacer devices

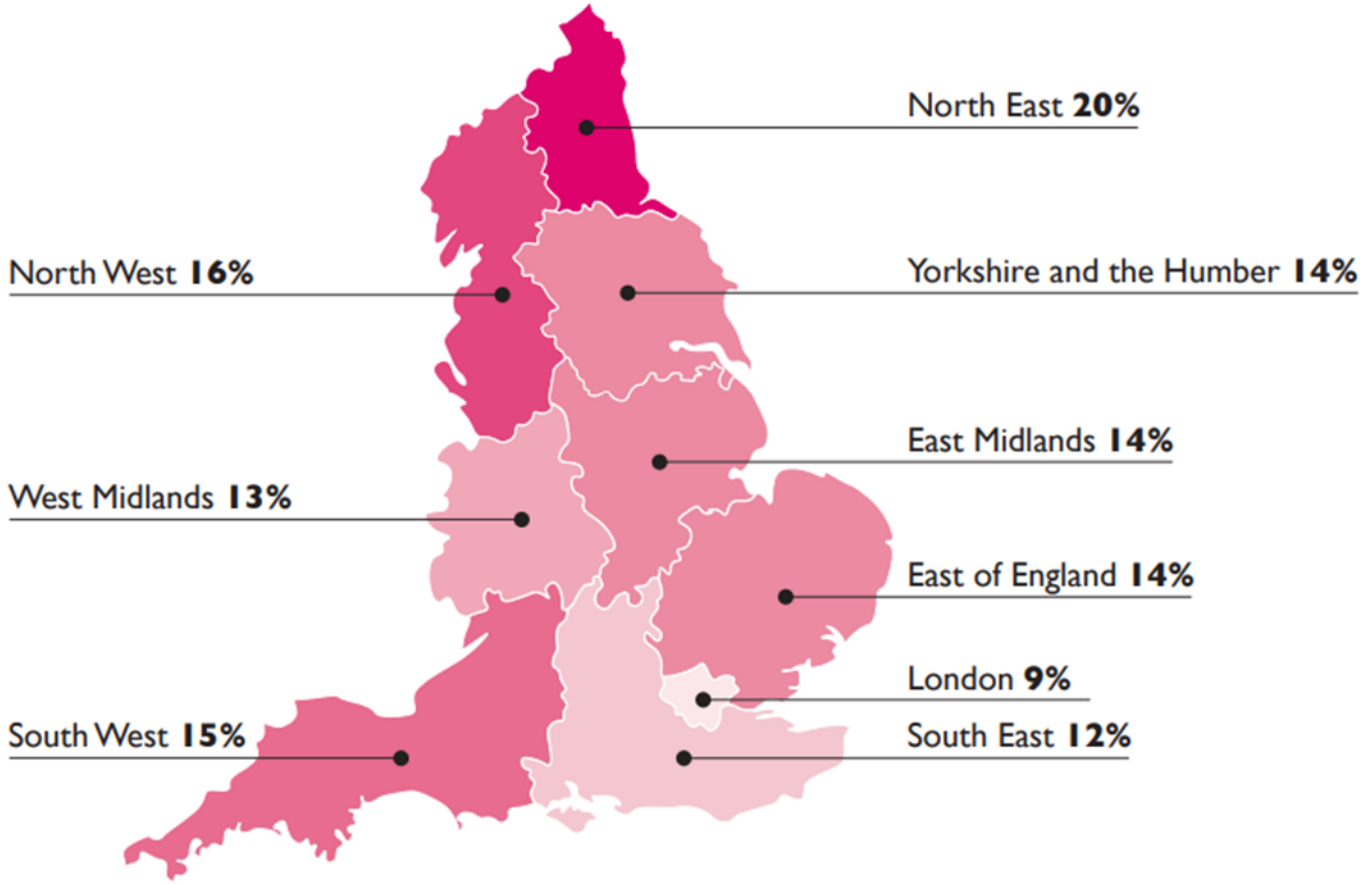
When to refer to secondary care?

Once **adherence and inhaler technique have been checked and optimised** and other conditions causing their symptoms have been treated or excluded, the following should trigger a referral to secondary care:

- Over the previous 12 months (any of):
  - ≥2 courses of oral corticosteroids for asthma
  - ≥1 hospital admission/ED attendance for asthma
  - ≥6 SABA used despite compliance with preventer
  - Poor symptom control (as assessed by validated questionnaire)
- On maintenance oral corticosteroids for asthma
- Diagnostic uncertainty

There are other medications licenced for use in asthma that are not covered in this guideline, including oral theophylline and LAMA inhaler therapy, in a separate inhaler or in combination with ICS/LABA as a triple inhaler. Although these are green on BSW formulary, please seek advice from or refer to secondary care before initiating these medications.[6]

Figure 2: Percentage of the registered asthma population who have been prescribed two or more courses of OCS (England only).



Source: Asthma UK's analysis of ***Astra Zeneca's heat maps***

Asthma UK; British Lung Foundation Partnership 2021;1-30

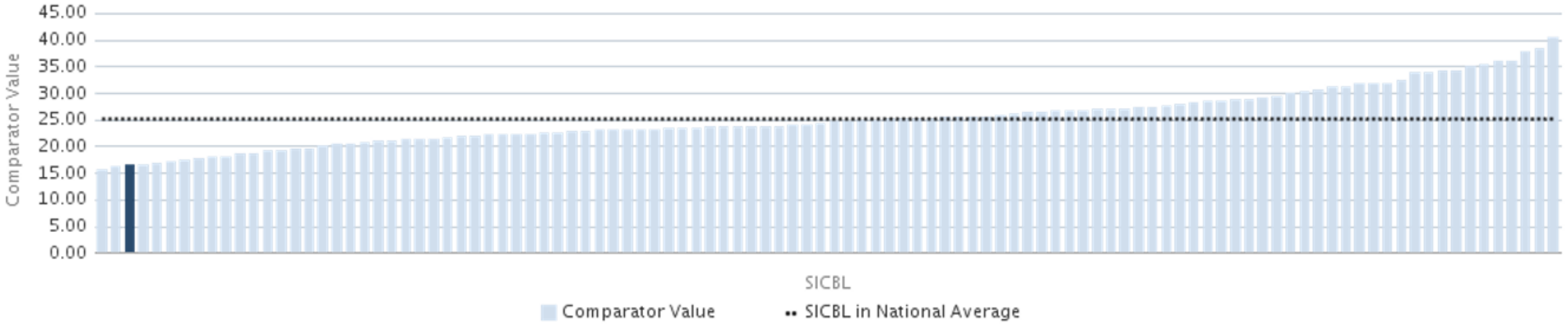
Proportion of patients receiving 6+ SABA inhalers

NHS BATH AND NORTH EAST SOMERSET, SWINDON AND WILTSHIRE ICB - 92G highlighted within results for all SICBLs during Dec-22

Numerator Definition Patients prescribed 6 or more SABA inhalers in a 12 month period, who were also prescribed a preventer inhaler but not prescribed an antimuscarinic

Denominator Definition Patients prescribed a preventer inhaler but not a antimuscarinic

Source: ePACT2



Proportion of patients receiving 6+ SABA inhalers

THE LAWN MEDICAL CENTRE (J83059) highlighted within results for NHS BATH AND NORTH EAST SOMERSET, SWINDON AND WILTSHIRE ICB - 92G during Dec-22

Numerator Definition Patients prescribed 6 or more SABA inhalers in a 12 month period, who were also prescribed a preventer inhaler but not prescribed an antimuscarinic

Denominator Definition Patients prescribed a preventer inhaler but not a antimuscarinic

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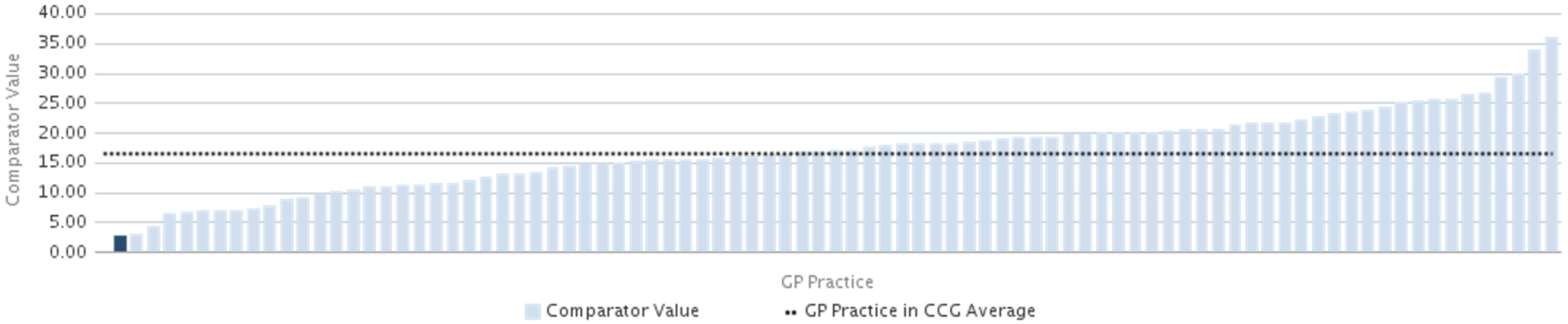

Other advice available

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Summary

- It is important to make the correct diagnosis
- Severe asthma is probably under recognised
- Pick the inhaler the patient can use
  - Remember a spacer if an MDI is chosen
- Consider referral to secondary care if
  - ≥2 courses oral steroids in 1 yr
  - ≥6 SABA inhalers in 1 yr
  - Uncontrolled symptoms despite optimal management