

Good Respiratory Control and the Climate Emergency

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Good Respiratory Control and the Climate Emergency

Current situation - respiratory care

Clinical carbon footprint and respiratory carbon footprint

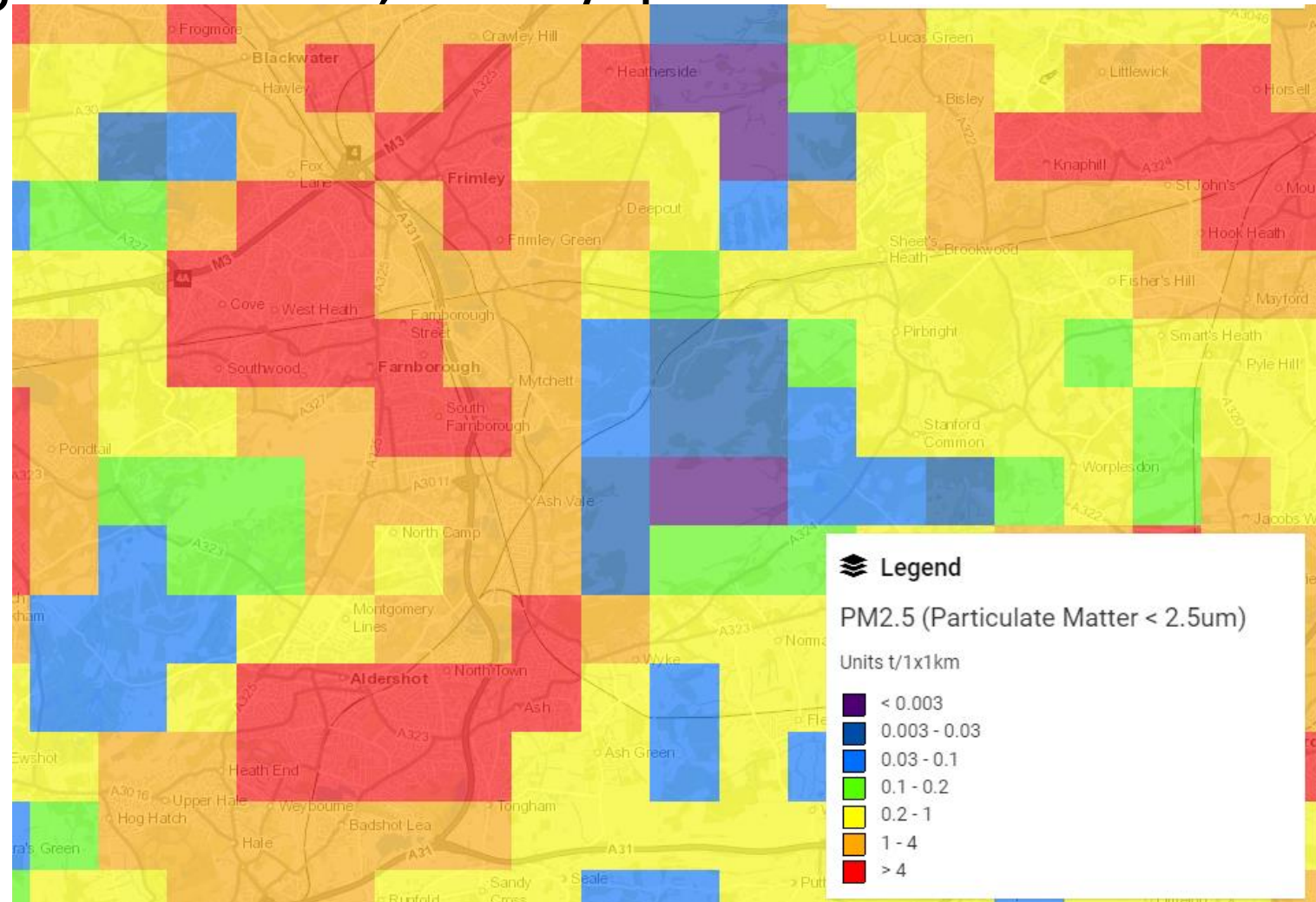
Improving patient care

Respiratory reviews

Recap - Breathing on a hot, dirty planet

13% of global
asthma incidence
due to traffic
pollution (Global Strategy for
Asthma Management and Prevention, 2020)

Hospital respiratory
admissions rise with
heatwaves



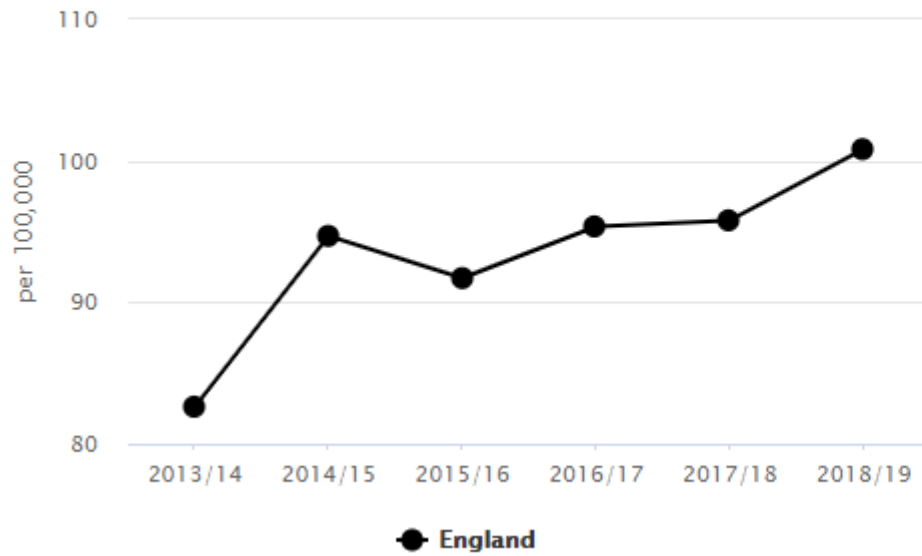
Asthma death toll in England and Wales is the highest this decade

More than 1,400 people died from an asthma attack (2018)
 25% increase in asthma deaths in the South-East

Emergency hospital admissions for asthma in adults (aged 19 years and over) England Directly standardised rate - per 100,000

[Export chart as image](#)

[Export table as CSV file](#)



Recent trend: ↑

Period	Count	Value	Lower CI	Upper CI
2013/14	33,595	82.6	81.7	83.6
2014/15	39,144	94.7	93.7	95.7
2015/16	38,386	91.7	90.7	92.7
2016/17	40,424	95.4	94.4	96.4
2017/18	41,025	95.8	94.8	96.8
2018/19	43,705	100.8	99.8	101.9

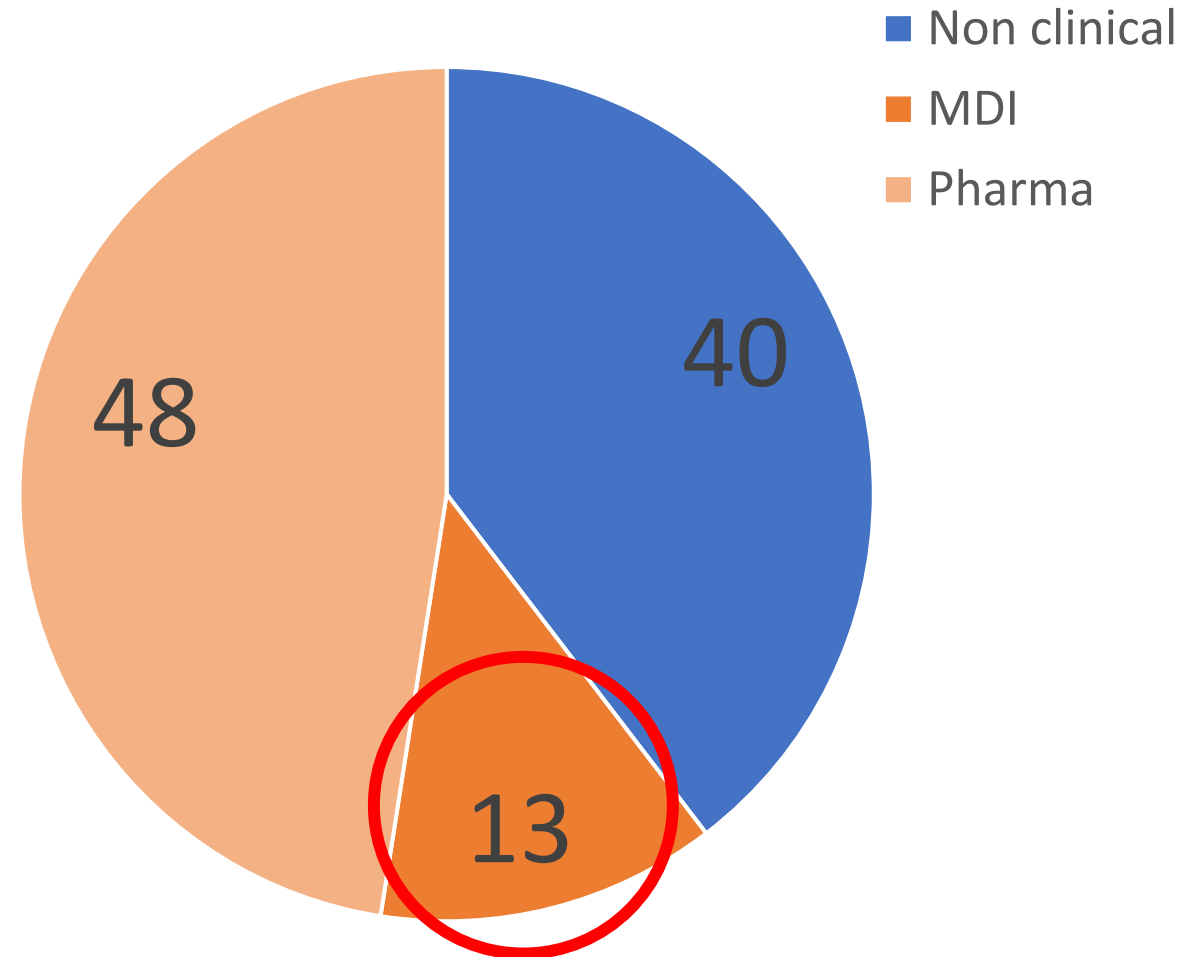
Source: PHE, based on data from NHS Digital



Clinical footprint

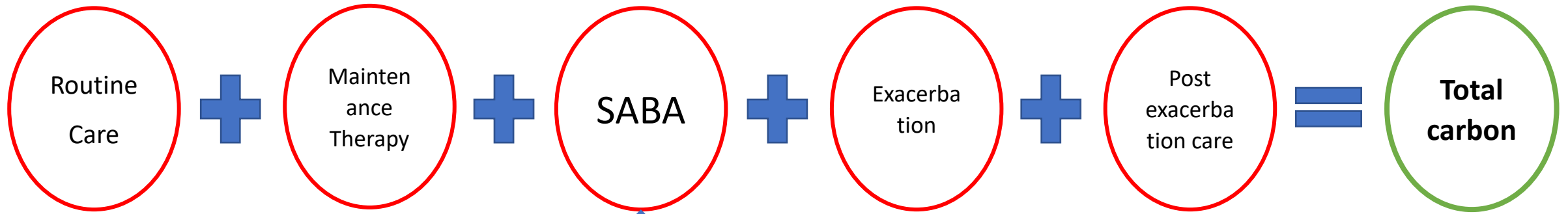
In primary care

	kilotonnes CO2e	%
MDI	767	13
Pharmaceuticals and chemicals	2,750	48





Improving respiratory patient outcomes



High uses of SABA (>3 per year)

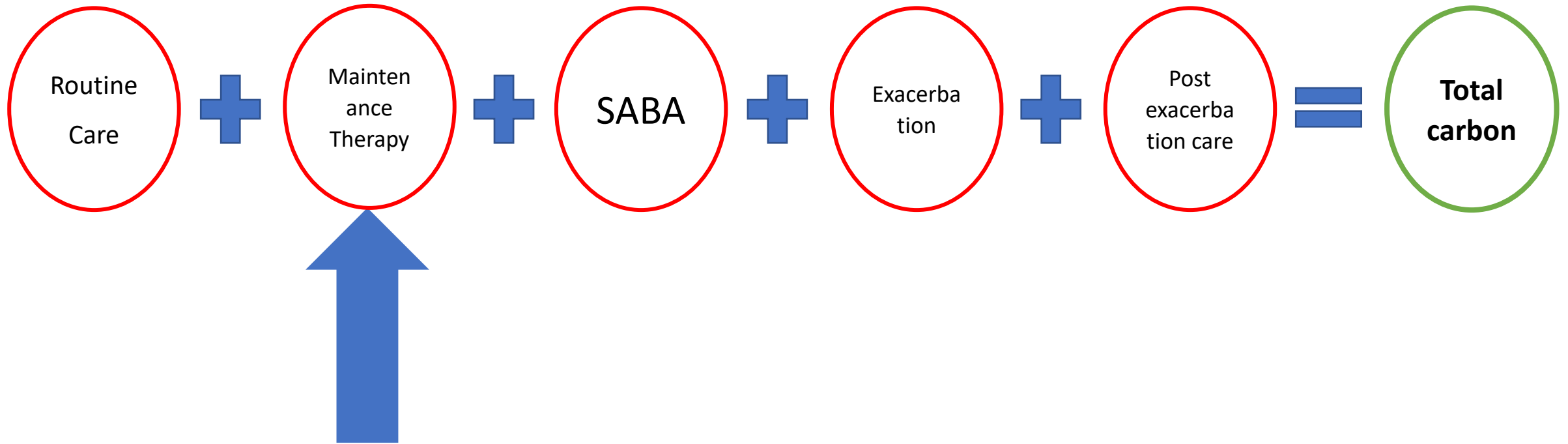
BTS 2	44%
BTS 3	54%
BTS 4	57%



Doubles the risk of exacerbation
Biggest reduction in emissions



Respiratory carbon footprint



Inadequate control with inappropriate inhaler

MDI – 20kg

DPI – 1kg



Worse control

Higher emissions

Why should we switch inhaler devices?

- Asthma care is still poor in the UK
- A poor inhaler technique is common for the majority
- MDIs are only useful with spacers
- DPIs can be used safely by the majority
- DPIs are better environmentally

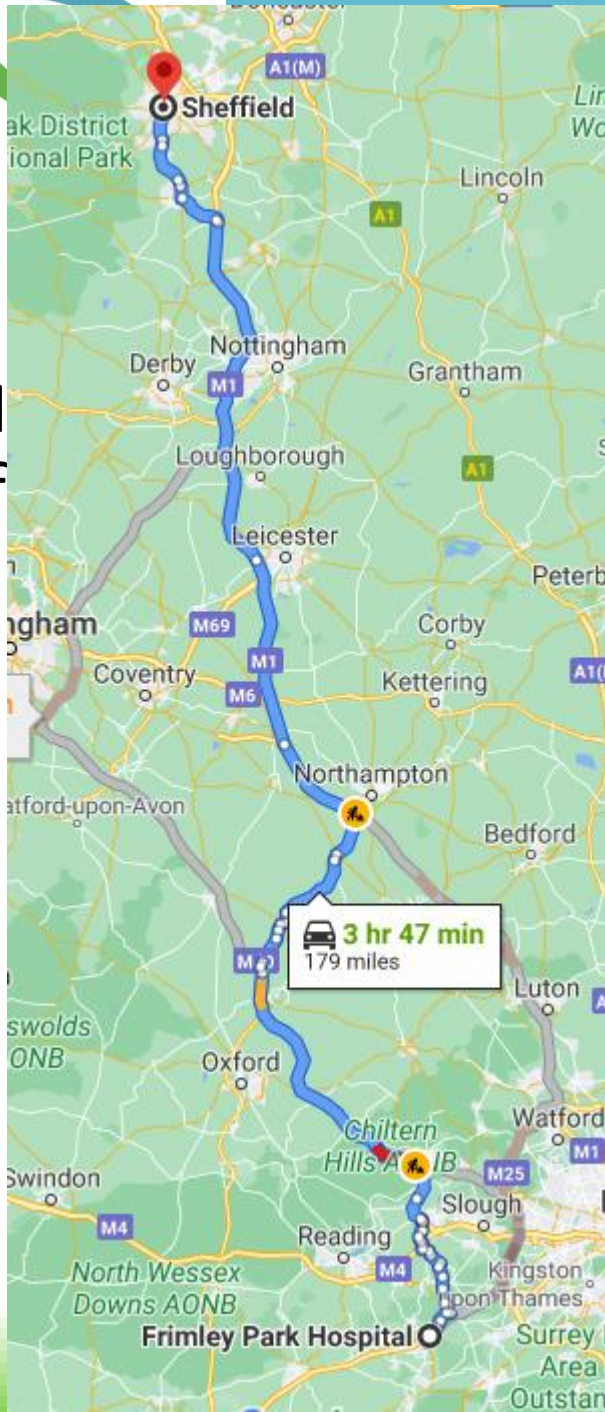
M
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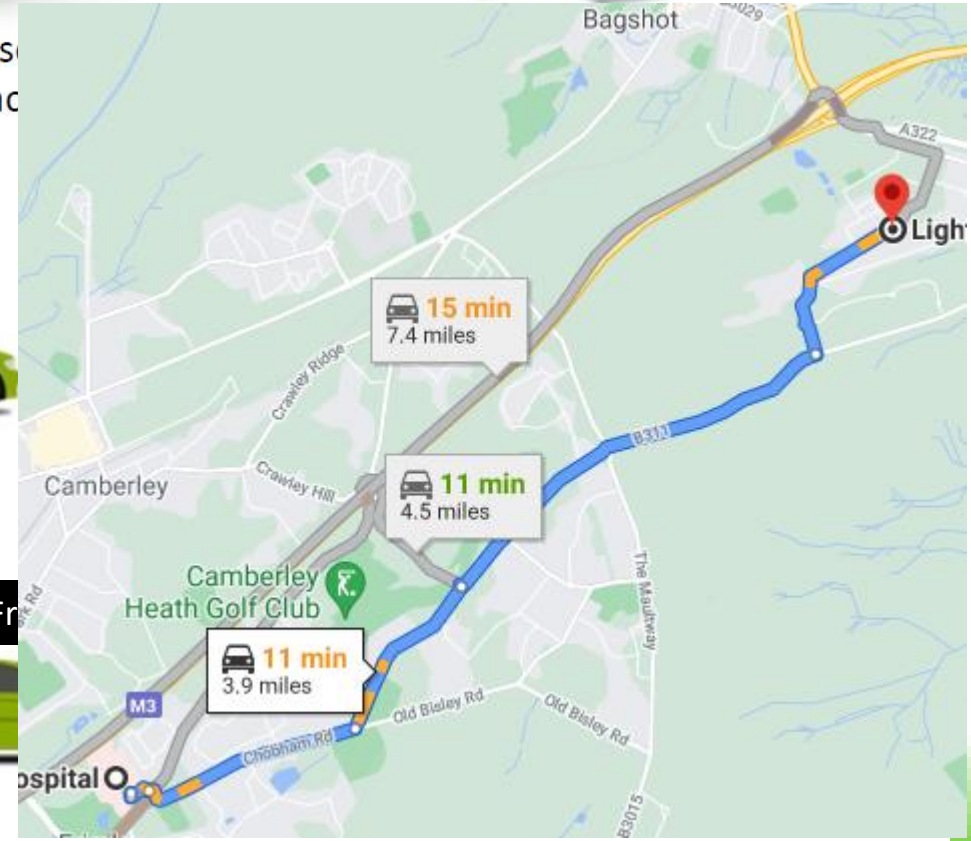
Frimley Hospital to Sheffield



Ventolin (100mcg) 200 doses
29kg CO₂e per pack



4 miles – Frimley



SABA overuse

3 or more prescriptions in 12 months (Patients receiving on average 6.51 prescriptions per year.)*

High SABA inhaler use was significantly associated with an **increased risk** of

- exacerbations,
- **asthma-related primary care consultations**
- and asthma-related hospital outpatient consultations**

Most SABA inhalers in the UK (97%) are MDIs

* https://thorax.bmj.com/content/76/Suppl_1/A19.1

** <https://link.springer.com/article/10.1007/s12325-020-01444-5>

Types of SABA inhalers

Inhaler name	Kg CO ₂ e
Ventolin_EvoHaler 100mcg (200 D)	24.13
Salbutamol_Inhaler 100mcg (200 D)	9.87
Salamol_Inhaler 100mcg (200 D) (Teva)	9.87
Salamol E-Breathe_Inhaler 100mcg (200 D)	9.87
Airomir_Inhaler 100mcg (200 D)	9.87
Airomir_Autohaler 100mcg (200 D)	9.87
AirSalb_Inhaler 100mcg (200 D)	9.87
Ipratrop Brom_Inhaler 20mcg (200 D)	9.87
Atrovent_Inhaler 20mcg (200 D)	9.87
Atrovent_Inhaler 20mcg (200 D)	9.87
Inhaler Ivent_Inhaler 20mcg (200D)	9.87
Ventolin_Accuhaler 200mcg (60 D)	0
Easyhaler_Salbutamol Sulf 100mcg (200D)	0
Easyhaler_Salbutamol Sulf 200mcg (200D)	0
Salbulin Novolizer_Inh 100mcg (200D) +Dev	0
Salbulin Novolizer_Inh 100mcg (200D) Ref	0
Bricanyl_Turbohaler 500mcg (100 D)	0



Easyhaler



Novolizer



Bricanyl

Maintenance inhalers

Green Inhaler

Making your inhaler more environmentally friendly

Home

The climate crisis is a health crisis

The Problem with Inhalers ▾

Inhaler comparison

The Solutions ▾

FAQs and Forum

About the Author

Disclaimer

Further Reading and Resources

Inhaler comparison

The information here contains estimates, but is accurate to the best of my knowledge. For simplicity, I've only included commonly used inhalers.

Commonly used inhalers contain either steroids to dampen down inflammation (known as inhaled corticosteroid or ICS), or airway openers (known as bronchodilators) which can be short-acting (relievers) or long-acting which work for 12-24 hours. Some inhalers combine different sorts of medications, such as a steroid and long-acting bronchodilator.

Most inhalers are either Metered Dose Inhalers (MDI) which contain HFA propellant, or Dry Powder Inhalers (DPI) which don't and therefore have far smaller carbon footprints.

Brown steroid inhalers

Approx 10-25kgCO₂e per inhaler:

- Clenil
- QVAR
- Beclomethasone MDIs

Approx 1kg per inhaler:

- Budesonide Easyhaler
- Beclometasone Easyhaler
- Flixotide Accuhaler
- Pulmicort Turbohaler

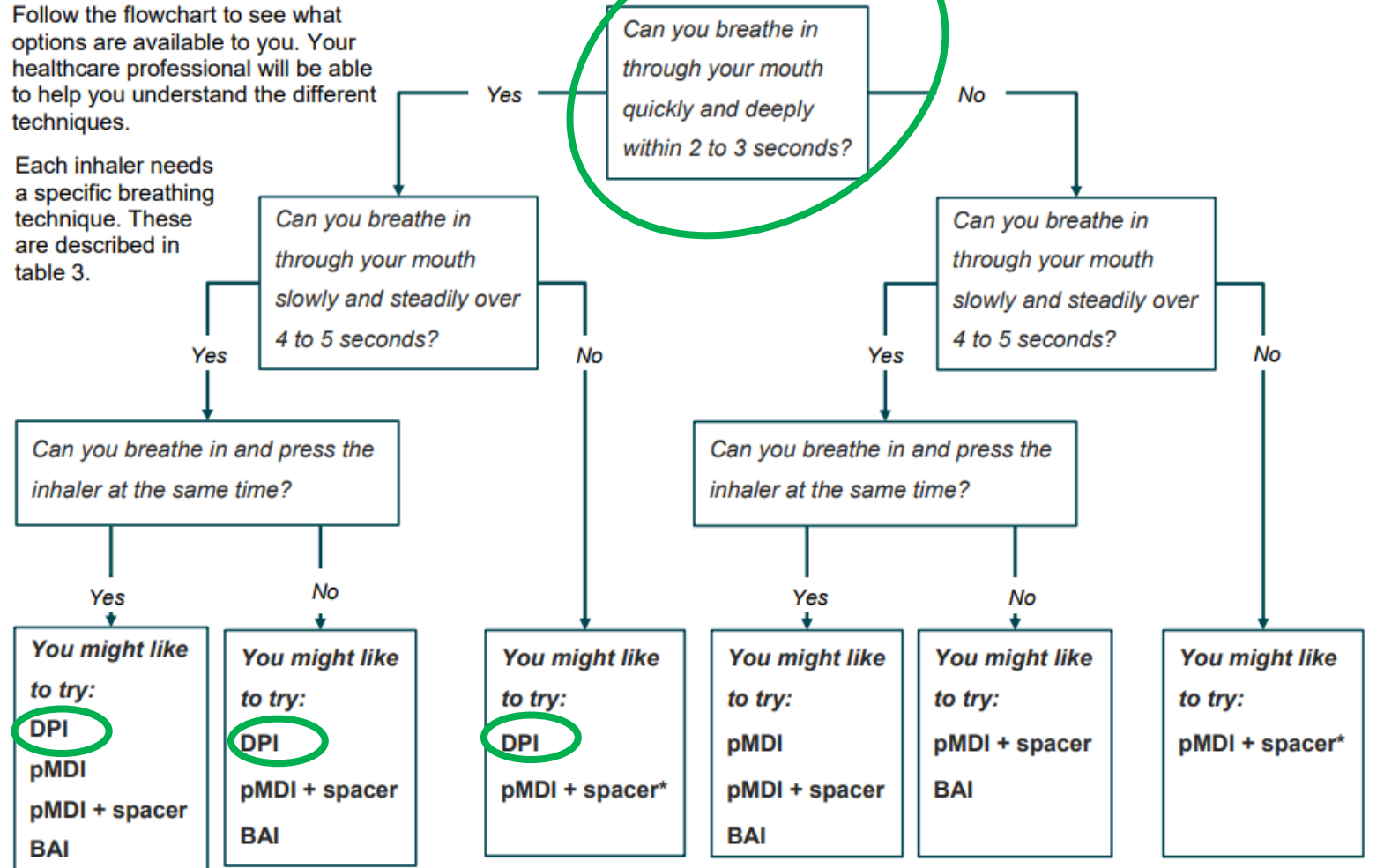
How to choose?

One question:
Can you breathe in through your mouth quickly and deeply within 2 to 3 seconds?

2: Flowchart – how to use the inhalers

Follow the flowchart to see what options are available to you. Your healthcare professional will be able to help you understand the different techniques.

Each inhaler needs a specific breathing technique. These are described in table 3.



BAI – breath-actuated metered dose inhaler; DPI – dry powder inhaler; pMDI – pressurised metered dose inhaler
* using multiple breath technique

Asthma reviews

Patient centred (from PCRS)

- Reviewing diagnosis and management
- Confirmation of diagnosis
- Previous medical history
- Patient understanding
- **Checking inhaler technique**
- **Discussing and reviewing adherence to therapy**
- **Checking smoking status and offering appropriate smoking cessation advice where appropriate**
- **Reviewing lifestyle and asthma triggers**
- Reviewing other concomitant conditions
- Reviewing treatment in line with national guidance
- Reviewing and discussing asthma action plan
- Tailoring asthma action plan to meet patient's needs and setting agreed goals
- **Utilising Asthma Right Care tools to assess reliance on short-acting beta-2-agonst**

The Royal College of Physicians three questions
Have you had difficulty sleeping because of asthma symptoms (including cough)?
Have you had usual asthma symptoms during the day (cough, wheeze, chest tightness or breathlessness)?
Has your asthma interfered with your usual activities(e.g. housework, college, work)?

Improve patient/lower carbon

Trigger avoidance

Improve patient/lower carbon

A poor inhaler technique is common

Patients – poor technique

- MDI – up to 90% (Sanchis et al, Chest; Hardwell et al, Primary Care Respiratory Journal)
- DPI – around 70%
- SMI – around 70 %

Staff who are teaching patients

- 9% of patients, 15% of nurses and 28% of physicians showed a correct inhalation technique (Plaza et al, Respiration)
- GPs worse than chest physicians

Over time, MDI technique has not improved (Sanchis et al, Chest)



MDIs are only useful with spacers

MDIs are only useful with spacers so...

- Most are not used correctly
- Therefore most are less effective



Observe and give advice on the person's inhaler technique:

- **at every consultation** relating to an asthma attack, in all care settings
- when there is deterioration in asthma control
- when the inhaler device is changed
- at every annual review
- if the person asks for it to be checked.

NICE Guideline 80 1.13.7

Impact of inhalers on an individuals footprint

On average, the carbon footprint of a UK citizen is about 35 kg CO₂e per day.

One Ventolin Evohaler has a footprint of around 25-30 kg CO₂e

- Annual carbon footprint per patient
 - **17 kg** for Relvar-Ellipta/Ventolin-Accuhaler
- vs
- **439 kg** for Seretide-Evohaler/Ventolin-Evohaler

Janson et al. 2020 Thorax v75,1



Reduce the need for inhalers

- Reduce the incidence of asthma
- Reduce exacerbations by improving maintenance and reducing SABA use
- Consider co-benefits of non pharmaceutical approach





Incentive scheme

GP Contract 2020

p60: Reducing the carbon impact of inhalers

“37. The NHS has committed to **reducing the carbon impact of inhalers** used in the treatment of respiratory conditions **by 50%**. These impacts are described in the [2019 BTS/SIGN Asthma guidelines](#) and by NICE in its 2019 [Shared Decision Aid on Asthma](#). All inhaler prescriptions, Structured Medication Reviews or planned Asthma Reviews taking place in primary care should consider moving or facilitating patients to lower carbon options *where it is clinically appropriate to do so.*”

<https://www.england.nhs.uk/wp-content/uploads/2020/02/update-to-the-gp-contract-agreement-2021-2324.pdf>

Low Carbon Inhalers Available on the Frimley Formulary- July 2020

1. The NHS is committed to cutting carbon emissions by 34% by 2020²
2. The NHS Long Term plan aims for a shift to low carbon inhalers to deliver a 4% reduction in carbon footprint²
3. MDIs have a high carbon footprint and DPIs have a low carbon footprint³

<u>Asthma</u>	<u>COPD</u>
SABA	SABA
Easyhaler Salbutamol *	Easyhaler Salbutamol
(Salamol MDI)	(Salamol MDI)
ICS	LAMA
Easyhaler Beclomethasone*	Incruse Ellipta*
	Eklira Genuair

<https://www.frimleyccg.nhs.uk/policies-and-documents/prescribing-guidance/prescribing-guidelines/respiratory-guidelines/119-changes-in-emollient-prescribing/file>

Our duty to tell patients

Adoo-Kissi-Debrah Inquest: Coroner Recommends Setting Health-based Legally-binding Air Quality Limits To Prevent Future Deaths From Air Pollution

The Coroner's final concern is that "adverse effects of air pollution on health **are not being sufficiently communicated to patients** and their carers by medical and nursing professionals".

The cost of air pollution is captured in a child's smile: it's time for 'Ella's law'
Jocelyn Cockburn and Guy Mitchell

As the family lawyers at Ella Adoo-Kissi-Debrah's inquest, we join her mother and the coroner in calling for changes to the environment bill



▲ Ella Adoo-Kissi-Debrah died in 2013. Her death certificate is the first to recognise air pollution as a cause of death. Photo: BBC News



Improving respiratory patient outcomes

Some ideas for sustainable QI projects:

1. [Eco-inhalers QIP](#): significantly reducing your GP surgery's (and patient's) carbon footprint with a simple switch.
2. [Audit](#) of patients simultaneously on a DPI and MDI inhaler who have never had a spacer
3. For patients who need to be on an MDI, you can reduce the carbon footprint of inhaler use by switching patients on 2 puffs of an inhaler bd (for example steroid inhalers) to a double strength inhaler, one puff bd
4. [Audit](#) of asthma patients who have had 3+ reliever inhalers in a year
5. Audit on anticholinergic burden score - with [step-by-step instructions](#) to reproduce it on SystmOne, on polypharmacy and deprescribing.

What else could our practice do?

Green Impact For Health

www.greenimpact.org.uk/GIforHealth

Declaring a climate emergency as a practice – why not?

seesustainability.co.uk/green-plan

Mobilising Health Professionals – Clean Air Champion Guide

www.cleanairhub.org.uk/files/mobilising_health_professionals_-_champions_handbook.pdf



The screenshot shows the top section of the Green Impact for Health website. On the left, there are three navigation arrows: a blue arrow labeled 'Intro', a purple arrow labeled 'Water', and a green arrow labeled 'Prescribing'. On the right, the main content area features the title 'Welcome to Green Impact for Health' and a paragraph for new users: 'New users: contact giforhealth@sos-uk.org for a registration code. This is a simple security check to stop inappropriate registrations.'

nus
green impact

RC GP Royal College of General Practitioners

About Help

Intro

Water

Prescribing

Welcome to Green Impact for Health

New users: contact giforhealth@sos-uk.org for a registration code. This is a simple security check to stop inappropriate registrations.



The screenshot shows the cover of a guide titled 'Climate emergency declaration'. The cover features an illustration of five diverse people standing around a globe. One person is holding a banner that says 'ENVIRONMENT'. Above them are icons for a sun, a wind turbine, and a water drop. The title 'Climate emergency declaration' is in a dark blue box, and below it, in a white box, is the subtitle 'A guide for primary care'. In the top right corner, there is a small logo for 'Dr Matt Sawyer See Sustainability'.

Dr Matt Sawyer
See Sustainability

Climate emergency declaration

A guide for primary care

Summary

Right inhaler

Right patient

Right time

- Need to reduce prevalence of respiratory conditions, **Air pollution**
- Need to improve inhaler technique, **Asthma UK videos**
- Need to become better at reducing SABA use/improving maintenance therapy – **look at the whole respiratory care pathway**

Can reduce disease burden *AND* lower the carbon footprint of inhalers

Any questions?

