

Norfolk and Waveney suggested options to reduce the carbon footprint of inhalers PHASE ONE **Age ≥ 18 years only**
Short-Acting Beta₂- Agonists (SABA) and Inhaled Corticosteroid plus Long-Acting Beta₂ Agonist (ICS / LABA) inhalers with the highest Global Warming Potential (GWP)

Background

- The NHS long term plan includes an ambition to reduce the carbon footprint through the shift to using lower carbon inhalers
- Inhalers are estimated to contribute 3.9% of the total carbon footprint of the NHS in the UK.
- The annual carbon footprint (CO₂e) of a patients' inhaler regime can vary from 15kg to 450kg depending on the inhalers used.
- Dry Powder Inhalers (DPIs) have the lowest global warming potential (GWP) but may not be suitable for all patients. Devices also differ in the level of inspiratory flow required (*Use an In-Check® Dial to check*). Pressurised Metered dose inhalers (pMDIs) vary in their GWP.
- MDIs which contain HFA227ea have the highest environmental impact followed by those which contain HFA134e. Aqueous mist inhalers (Respimat) have a similar impact to DPIs
- The two pMDIs with the highest GWP are Flutiform® and Symbicort® pMDI (HFA227ea), followed by Ventolin® Evohaler (HFA134a *large volume SABA - contains more propellant*)

Options to help reduce the carbon footprint of inhalers

- **Ensure that patients have their inhaler technique and concordance checked regularly.** If the patient can, and does, use their inhalers effectively control of their respiratory condition will be maximised. *This will reduce waste and **the need for emergency use of short-acting beta₂-agonist inhalers (SABAs)** e.g. salbutamol*
- **Advise patients to return used inhalers to their pharmacy/dispensary for recycling** (*may be available - the aluminium, plastic and propellants can be reused*) or **waste collection** (*thermal degradation of the HFA has a lower global warming potential*)
- **Choose inhalers with dose counters / ensure the patient is aware of how many doses their device contains.** *This reduces waste and carbon footprint via disposing half-used inhalers.*
- **Switch to an inhaler with a lower GWP** (*at patient review with a suitably trained Healthcare professional- HCP*) e.g. a DPI or, **if a DPI is not clinically appropriate**, an pMDI with a lower environmental impact (HFA134a small volume). *Some patients cannot generate the necessary inspiratory flow necessary for DPIs (approx. min required 30 l/min) **particularly during exacerbations***

Other key considerations when choosing inhaler devices



- **Airways severity** – *consider inspiratory flow, risk of frequent exacerbations etc*
- **Ability to use the device / device consistency** – *inspiratory flow and manual dexterity?*
- **Personal preference / patient factors** – *e.g. size, number of doses per day*
- **Efficacy and adverse effects of the drug content**

See [NICE Patient decision aid - inhalers for asthma May 2019](#) (*includes chart with information on GWP*)

Short-Acting Beta₂- agonists (SABA)







Things to consider and device information (salbutamol only)

- **Risk of severe attack / exacerbation** –For patients at high risk, an MDI + spacer may still be the most clinically appropriate option. *DPIs are not recommended for use during a severe exacerbation due to reduced inspiratory flow and ability to use the device.*
- **Patients with very well controlled asthma** *ideally* may only need one SABA inhaler per year – check in use shelf life and advise the patient. *Consider issuing a separate MDI + spacer for emergency use if standard treatment is via a DPI.*³
- **Which other type of device(s) does the patient use?** – aim for device consistency

Device Feature	Ventolin® EvoHaler	Salamol pMDI Inhaler® (or generically written - <i>but some pharmacies may supply Ventolin</i>)	Easyhaler® Salbutamol	Ventolin® Accuhaler (less cost-effective)
Device Type	pMDI <i>large volume</i>	pMDI <i>small volume</i>	BA DPI	BA DPI
Dose Counter	No	No	Yes	Yes
In use shelf life	2 years	3 years	6 months	3 years
Image				

Inhaled Corticosteroid + Long-Acting Beta₂ Agonist (ICS / LABA)

Device information (more cost-effective DPIs only included – others are available)

Device Feature	Flutiform®	Symbicort® pMDI	Fobumix Easyhaler®	Fostair® pMDI	Fostair NEXThaler®	Relvar Ellipta®
Device Type	pMDI & BA K-haler HFA227ea	pMDI HFA227ea	BA DPI	pMDI HFA134e	BA DPI	BA DPI
Dose Counter	Yes	Yes	Yes	Yes	Yes	Yes
In use shelf life	3 months	3 months	4 months	3 months Store in fridge until opened	6 months	6 weeks
Image example						
Product Licence	Asthma 50/5 ≥ 5yrs 125/5 ≥ 12yrs 250/10 ≥ 18yrs	COPD ≥ 18yrs	Asthma (incl MART for 80/4.5 or 160/4.5) & COPD ≥ 18yrs	Asthma (incl MART for 100/6) & COPD 100/6 ≥ 18yrs	Asthma (incl MART for 100/6) & COPD 100/6 ≥ 18yrs	92/22: Asthma & COPD 184/22: Asthma ≥12yrs
Suggested SABA device to ensure consistency			Salbutamol Easyhaler same device	Salamol / generic pMDI same device	Ventolin Accuhaler <i>similar device</i>	Ventolin Accuhaler <i>similar device</i>
RED	Higher Global Warming Potential (GWP)		GREEN	Lower GWP / consideration of device consistency		

References:

1. [Wilkinson AJK, Braggins R, Steinbach I, et al. Costs of switching to low global warming potential inhalers. An economic and carbon footprint analysis of NHS prescription data in England. BMJ Open 2019;9:e028763. doi: 10.1136/bmjopen-2018-028763](https://www.bmjopen.com/content/2019/9/e028763)
2. <https://www.medicines.org.uk/emc>
3. [Keelevy D, Partridge MR. Emergency MDI and spacer packs for asthma and COPD. Lancet Respir Med 2019;7:380–2.](https://www.lancet.com/article/S2468-2667(19)30002-2)

PHASE ONE: Suggested switches from SABA and ICS / LABA inhalers with the highest Global Warming Potential (GWP) to a device with a lower GWP

Age ≥ 18 years only

ONLY if clinically appropriate and at patient review with a suitably trained HCP



Norfolk and Waveney
Clinical Commissioning Group

Switch FROM ➔	Drug Content	Dose [‡]	Cost [*]	Switch TO ⬇️ Cost-effective options with most similar content only included- <i>other DPIs are available</i>	Drug content	Dose [‡]	Cost p/a [*]	Potential CO ₂ e ^{**} saving per inhaler ¹
Ventolin Evohaler pMDI	Salbutamol 100mcg/dose	1-2 doses PRN	£1.50 200 doses	Salamol pMDI <i>(or generically written salbutamol if supply issues of concern)</i>	Salbutamol 100mcg/dose	1-2 doses PRN	£1.46 200 doses	18kg
				Easyhaler Salbutamol 100mcg			£3.31 200 doses	Approx. 25kg
				Ventolin Accuhaler 200mcg <i>(less cost-effective)</i>	Salbutamol 200mcg/dose	1 dose PRN	£3.60 60 doses	Approx. 25kg
Symbicort pMDI [^] 200/6	Budesonide / formoterol	2p BD	£340	Fobumix Easyhaler 320/9 ^{^#}	Budesonide / formoterol	1p BD	£262	Approx. 36kg
				Fostair 100/ NEXThaler ^{^#\$}	Extra-fine Beclometasone / formoterol	2p BD	£357	Approx. 36kg
				Fostair 100/6 pMDI ^{^#\$}			£357	20kg
Flutiform 50/5 [#]	Fluticasone propionate / formoterol	2p BD	£175	Fobumix Easyhaler 80/4.5 ^{##}	Budesonide / formoterol	2p BD	£262	Approx. 36kg
				Fostair 100/6 NEXThaler ^{^#\$}	Extra-fine Beclometasone / formoterol	1p BD	£178	Approx. 36kg
				Fostair 100/6 pMDI ^{^#\$}			£178	20kg
Flutiform 125/5 [#]		2p BD	£340	Fobumix Easyhaler 160/4.5 ^{^#\$}	Budesonide / formoterol	2p BD	£262	Approx. 36kg
				Fostair 100/6 NEXThaler ^{^#\$}	Extra-fine Beclometasone / formoterol	2p BD	£357	Approx. 36kg
				Fostair 100/6 pMDI ^{^#\$}			£357	20kg
Flutiform 250/10 [#]	2p BD	£554	Fobumix Easyhaler 320/9 ^{^#}	Budesonide / formoterol	2p BD [#]	£523	Approx. 36kg	
			Fostair 200/6 NEXThaler [#]	Extra-fine Beclometasone / formoterol	2p BD	£357	Approx. 36kg	
			Fostair 200/6 pMDI [#]			£357	20kg	
			Relvar Ellipta 184/22 [#]	Fluticasone furoate/ vilanterol	1p OD	£359	Approx. 36kg	

MART - Maintenance & Reliever Therapy [^] licensed for COPD [#] licensed for asthma ^{\$} licensed for asthma MART regimen BA DPI - Breath-actuated Dry Powder Inhaler
*Cost January 2020 **CO₂e – annual carbon footprint. [‡] Dose equivalence suggestions based on [NICE Asthma NG 80 ICS doses](#) ICS DOSE low – moderate – high

Title	Norfolk and Waveney suggested options to reduce the carbon footprint of inhalers PHASE ONE
Description of policy	<i>To inform healthcare professionals</i>
Scope	<i>All healthcare professionals</i>
Prepared by	AGEM CSU Medicines Optimisation Team Norfolk & Waveney
Other relevant approved documents	
Evidence base / Legislation	Level of Evidence: <i>A. based on national research-based evidence and is considered best evidence</i> B. mix of national and local consensus <i>C. based on local good practice and consensus in the absence of national research based information.</i>
Dissemination	Is there any reason why any part of this document should not be available on the public web site? <input type="checkbox"/> Yes / No <input checked="" type="checkbox"/>
Approved by	<i>Norfolk & Waveney Prescribing Reference Group 08.10.2020</i>
Authorised by	<i>Norfolk & Waveney Drug & Therapeutics Commissioning Group (Date)</i>
Review date and by whom	Medicines Optimisation Team
Date of issue	

Version Control

Version	Date	Author	Status	Comment
0.1	Jan 2020	Medicines Optimisation Team (MC)	Draft	Adapted from initial version produced by Michael Dennis
0.2	20.02.2020	Medicines Optimisation Team (MC)	Draft	Amended with comments from Michael Dennis & Jessica Adcock
0.3	28.02.2020	Medicines Optimisation Team (MC)	Draft	Discussed at Norfolk & Waveney Respiratory Working Group 19.2.20 and amended with comments from Daryl Freeman
0.4	10.09.2020	Medicines Optimisation Team (MC)	Draft	Amended with comments from GYW GP group via MD. Discussed at PRG 08.10.20.
1.0	21.10.2020	Medicines Optimisation Team (MC)	FINAL	Amended with comments from PRG