

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)

[Click for Norfolk and Waveney ICS website patient information](#)

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 HFA134a. Soft-mist (SMI) 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, if available, ensure that the patient is aware of how many doses their device contains.** *This reduces the waste and carbon footprint from disposing half-used inhalers. All DPIs have dose counters.*
- **Switch to an inhaler with a lower GWP** (*at patient review with a suitably trained Healthcare professional- HCP*) e.g., a DPI / SMI or, **if not clinically appropriate**, a 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 , product licence** (*e.g., Maintenance and Reliever Therapy, MART*) **and adverse effects of the drug content**

Click the following links for: [NICE Patient decision aid - inhalers for asthma \(incl. chart with information on GWP\)](#)
[The Primary Care Respiratory Society: Guidance on making safe and clinically appropriate changes to inhalers](#)
[Beat Asthma Leaflet: How can I tell if my inhaler is empty](#)

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 fixed dose treatment is via a DPI.*³
- **Which other type of device(s) does the patient use?** – aim for device consistency

| Device Feature | Ventolin® Evoaler | Salamol pMDI Inhaler® <i>(if generically written- Ventolin Evoaler may be dispensed)</i> | Easyhaler® Salbutamol | Ventolin® Accuhaler |
|-------------------|---|---|---|---|
| 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 | 2 years |
| Image |  |  |  |  |

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

Device information: cost-effective DPIs, with similar drug content (see table on next page) [see Norfolk and Waveney net.formulary](#) for all other device options and other drug content

| Device Feature | Flutiform® | Symbicort® 200/6 pMDI | Fobumix Easyhaler® | WockAIR® | Luforbec® pMDI | Fostair NEXThaler® | Relvar Ellipta® |
|---|---|---|---|---|---|---|---|
| Device Type | pMDI HFA227 | pMDI HFA227 | BA DPI carbon neutral | BA DPI | pMDI HFA134a carbon neutral | BA DPI | BA DPI |
| Dose Counter | Yes | Yes | Yes | Yes | Yes | Yes | Yes |
| In use shelf life | 3 months | 3 months | 4 months | 2 years | 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 <i>(incl MART for 80/4.5 or 160/4.5)</i> & COPD ≥ 18yrs | Asthma <i>(incl MART for 160/4.5)</i> ≥ 12yrs & COPD ≥ 18yrs | Asthma <i>(incl MART for 100/6)</i> & COPD 100/6 ≥ 18yrs | Asthma <i>(incl MART for 100/6)</i> & COPD 100/6 ≥ 18yrs | 92/22: Asthma & COPD 184/22: Asthma ≥12yrs |
| Suggested SABA device to ensure consistency | | | Salbutamol Easyhaler | Ventolin Accuhaler | Salamol pMDI | Ventolin Accuhaler | Ventolin Accuhaler |
| RED | Highest Global Warming Potential (GWP) | | GREEN | Lowest GWP | | Lower GWP | |
| With 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](#)
2. <https://www.medicines.org.uk/emc>
3. [Keeley D, Partridge MR. Emergency MDI and spacer packs for asthma and COPD. Lancet Respir Med 2019;7:380–2](#)
4. [MIMs carbon footprint inhaler table Nov 22](#)
5. <https://www.nice.org.uk/guidance/ng80/resources/inhalers-for-asthma-patient-decision-aid-pdf-6727144573>

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

| Switch FROM ➡ | Drug Content | Dose [‡] | Cost p/a* 200 doses | Switch TO ⬇️ Cost- effective options with <i>most similar drug content</i> only included- <i>other DPIs and drug content are available</i> | Drug content | Dose [‡] | Cost p/a* (365 days) | Approx. potential CO ₂ e** saving per inhaler ⁴ 9-mile car journey = 2.61kgCO ₂ e ⁵ |
|-----------------------------------|-------------------------------------|-------------------|------------------------|--|---|--------------------|-------------------------|--|
| Ventolin Evohaler pMDI | Salbutamol 100mcg/dose | 1-2 doses PRN | £1.50 | Easyhaler Salbutamol 100mcg <i>carbon neutral (cn) DPI</i> | Salbutamol 100mcg/dose | 1-2 doses prn | £3.31 200 doses | ⬇️ 27kg (cn) / 93 car miles |
| | | | | Ventolin Accuhaler 200mcg | Salbutamol 200mcg/dose | 1 dose prn | £1.99 60 doses | ⬇️ 27kg / 93 car miles |
| | | | | Salamol pMDI (NB if generically written- Ventolin Evohaler may be dispensed) | Salbutamol 100mcg/dose | 1-2 doses prn | £1.46 200 doses | ⬇️ 16kg / 55 car miles |
| Symbicort pMDI [^] 200/6 | Budesonide / formoterol | 2p BD | £340 | Fobumix Easyhaler 320/9 [^] # <i>carbon neutral</i> | Budesonide / formoterol | 1p BD | £262 | ⬇️ 34kg (cn) / 117 car miles |
| | | | | WockAIR 320/9 [^] # (2x60dose in one pack) | Budesonide / formoterol | 1p BD | £231 | ⬇️ 33kg / 114 car miles |
| | | | | Fostair 100/6 NEXThaler [^] #\$ | Extrafine beclometasone / formoterol | 2p BD | £357 | ⬇️ 34kg / 117 car miles |
| | | | | Luforbec 100/6 pMDI [^] #\$ <i>carbon neutral</i> | Extrafine beclometasone / formoterol | 2p BD | £250 | ⬇️ 23kg (cn) / 79 car miles |
| Flutiform pMDI 50/5 # | Fluticasone propionate / formoterol | 2p BD | £175 | Fobumix Easyhaler 80/4.5 # \$ <i>carbon neutral</i> | Budesonide / formoterol | 2p BD | £262 | ⬇️ 36kg (cn) / 124 car miles |
| | | | | Fostair 100/6 NEXThaler [^] #\$ | Extrafine beclometasone / formoterol | 1p BD | £178 | ⬇️ 36kg / 124 car miles |
| | | | | Luforbec 100/6 pMDI [^] #\$ <i>carbon neutral</i> | Extrafine beclometasone / formoterol | 1p BD | £125 | ⬇️ 25kg (cn) / 86 car miles |
| Flutiform pMDI 125/5 # | Fluticasone propionate / formoterol | 2p BD | £340 | Fobumix Easyhaler 160/4.5 [^] #\$ <i>carbon neutral</i> | Budesonide / formoterol | 2p BD | £262 | ⬇️ 36kg (cn) / 124 car miles |
| | | | | WockAIR 160/4.5 [^] #\$ (2x60dose in one pack) | Budesonide / formoterol | 2p BD | £231 | ⬇️ 35kg / 121 car miles |
| | | | | Fostair 100/6 NEXThaler [^] #\$ | Extrafine beclometasone / formoterol | 2p BD | £357 | ⬇️ 36kg / 124 car miles |
| | | | | Luforbec 100/6 pMDI [^] #\$ <i>carbon neutral</i> | Extrafine beclometasone / formoterol | 2p BD | £250 | ⬇️ 25kg (cn) / 86 car miles |
| | | | | Relvar Ellipta 92/22 [^] # | Fluticasone <i>furoate</i> / vilanterol | 1p OD | £268 | ⬇️ 36kg / 124 car miles |
| Flutiform pMDI 250/10 # | Fluticasone propionate / formoterol | 2p BD | £554 | Fobumix Easyhaler 320/9 [^] # <i>carbon neutral</i> | Budesonide / formoterol | 2p BD [#] | £523 | ⬇️ 36kg (cn) / 124 car miles |
| | | | | WockAIR 320/9 [^] # (2x60dose in one pack) | Budesonide / formoterol | 2p BD [#] | £462 | ⬇️ 35kg / 121 car miles |
| | | | | Fostair 200/6 NEXThaler # | Extrafine beclometasone / formoterol | 2p BD | £357 | ⬇️ 36kg / 124 car miles |
| | | | | Luforbec 200/6 pMDI # <i>carbon neutral</i> | Extrafine beclometasone / formoterol | 2p BD | £250 | ⬇️ 25kg (cn) / 86 car miles |
| | | | | Relvar Ellipta 184/22 [#] | Fluticasone <i>furoate</i> / vilanterol | 1p OD | £359 | ⬇️ 36kg / 124 car miles |

MART - Maintenance & Reliever Therapy [^] licensed for COPD # licensed for asthma \$ licensed for asthma MART regimen BA DPI - Breath-actuated Dry Powder Inhaler
*Cost August 2022 **CO₂e – annual carbon footprint. ‡ Dose equivalence suggestions based on [NICE Asthma NG 80 ICS doses](#) ICS DOSE low – moderate – high