

Position Statement – Environmental Impact of Inhalers

November 2021

BACKGROUND

Environmental impact, measured as the carbon footprint, is different for every specific product and proper quantification is needed to assess current impact. Calculation of the carbon footprint of the products has been performed considering the whole product lifecycle.

Pressurised metered-dose inhalers (pMDIs) and dry powder inhalers (DPIs) are the most commonly used devices for inhaled drug delivery in the treatment of asthma and COPD. Soft-mist inhalers (SMIs) are also used in the treatment of COPD and to a lesser extent in asthma. pMDIs contain propellants hydrofluorocarbons (HFCs), liquified gases providing the force to generate the aerosol cloud. Breath-actuated aerosol inhalers contain the same propellants as pMDIs and so are assumed to have a similar carbon footprint to pMDIs.

While HFCs are not damaging to the ozone layer, they are still potent greenhouse gases, and currently metered-dose inhalers contribute an estimated 3.9% of the carbon footprint of the NHS in the UK, the other 96.1% is made up of a number of activities such as heating, cooling and transport by far make up the majority of this.¹ In 2017, around 50 million inhalers were prescribed in England, of which seven out of ten were metered-dose inhalers, compared to only one in ten in Sweden.²

British Thoracic Society asthma guidelines³ and the NHS Long Term Plan⁴ advise that CCGs should be working to reduce the climate impact of respiratory medications.

Making the right clinical choice for patients must remain the primary focus for clinicians.

The wider clinical issues described below should be considered before switching to greener alternatives. It is important that we do not restrict inhaler choice and risk patient harm from worse outcomes or deterioration in stable patients.

SEL RRP supports the Primary Care Respiratory Society statement⁵ which does not advocate ‘blanket switching’ of patients from pMDIs to DPIs. Blanket switching can lead to a number of problems including increased patient confusion regarding their treatment, inability to use the inhaler device, lack of confidence in their inhaled treatment and in their healthcare provider and most importantly, increased risk of poorer clinical outcomes such as deterioration in symptoms, increased exacerbation rates and increased rate of hospitalisation. Any decisions about inhaler choice should be made on an individual basis with the support of a healthcare professional. If the patient has no inhaler preference, consider initiating a DPI or SMI if clinically appropriate. Where an pMDI is the inhaler of choice for a patient, they should be encouraged to make optimise inhaler use by using the pMDI with a spacer. This applies to both long-acting inhalers and short-acting inhalers. Spacers increase lung deposition of the inhaled medication, thereby increasing its clinical effectiveness.

Approaches to more sustainable solutions should therefore effectively balance environmental goals with patient health outcomes, whilst maintaining a diverse range of therapeutic choices across a wide variety of inhaler devices. This allows the patient to select the most appropriate medication-device combination for them, in collaboration with their healthcare professional. In the short term, actions can be taken to reduce inappropriate use and waste, such as better training and education for physicians and patients on inhaler indication and technique, as well as improved disposal and recycling of used inhalers.⁶ Ongoing research to make development programmes of environmentally-friendly pMDIs using low Global Warming Potential (GWP) propellants by 2025 has been announced.^{7, 8} Therefore, restrictive and short-term device switching approaches risk to undermine the innovation around low GWP inhalers, missing the opportunity of a major environmental driver and preventing groups of patients to access the appropriate solutions that they need for the optimal continuity of their care.

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The Jeswani and Azpagic paper⁹ shows that DPIs can have adverse environment effects as well and these adverse effects tend to be worse than pMDIs in several areas, though they are best when it comes to carbon footprint. The paper also surmises that using a new pMDI propellant (HFC 152a, likely to appear in pMDIs in the next 3-4 years) with a lower carbon footprint is likely to be most environmentally friendly overall when considering all the differing aspects of environmental impact.

SEL PLEDGE TO REDUCE INHALER CARBON FOOTPRINT

1. Better patient education to support adherence with preventer use

Empower patients by helping them to understand their condition and how their treatments work. Do not escalate therapy without confirming adherence first.

2. Use combination inhalers where appropriate and where one is available

This will reduce the overall number of inhalers used and be more convenient for patients. Choose once daily dosing if best for the patient.

3. Improve ASTHMA and COPD control and reduce SABA use

Encourage smoking cessation, pulmonary rehabilitation, flu immunisation, Covid vaccination and regular long acting bronchodilators. Also, a pneumococcal vaccine is a recommendation for COPD patients.

4. Make every puff count

- Use every opportunity to optimise inhaler technique. Remind patients to adopt a "quick and deep" inhalation technique where a DPI is prescribed, or a "slow and steady" intake of breath where a pMDI is prescribed. All patients prescribed a pMDI should be encouraged to use their pMDI via a spacer and educated on the benefits of doing so (increased lung deposition making the medication more clinically effective, reduced co-ordination problems and lower risk of oral thrush due to reduced oral deposition of drug). Prescribe inhalers where the lowest number of puffs is used to deliver the dose. All patients should be signposted to videos demonstrating inhaler technique on websites such as RightBreathe.com and Asthma.org.uk, so that inhaler technique can be practised at home using mirror and video.

5. Increased utilisation of reusable inhaler device or their components

Respimat[®] inhalers are now available as reusable device with multiple exchangeable cartridges. Using the reusable device with all 6 refill cartridges can reduce the product carbon footprint by 71%, compared with the disposable Respimat[®].¹⁰ See below for Respimat[®] prescribing support information.

6. Choosing the most environmentally friendly inhalers where suitable

Switch to or initiate with DPIs or SMIs only where clinically appropriate, safe and acceptable to patient.

7. Monitor inhaler prescription requests and over-ordering

Empower prescription clerks and community pharmacies to alert the appropriate clinicians where inappropriate ordering or over-ordering inhalers is suspected. It is the responsibility of all healthcare staff to support patients to use their medicines appropriately and to optimise medication adherence.

8. Used inhalers should not be placed in general waste

Used pMDI canisters still contain propellants; all used pMDI canisters should be returned to a pharmacy to dispose of in an environmentally safe way. Used inhalers that are not returned to pharmacies but are placed in general waste for kerbside collection may end up in landfill, depending on local authority arrangements. As well as plastic pollution, this risks crushing or piercing the pMDI / Breath Actuated Inhaler canister and releasing additional propellants into the atmosphere. Inhalers should be placed in the pharmacy's pharmaceutical waste bins, which are incinerated (destroying the greenhouse gases); steel and aluminium may be recovered and recycled at some incinerators. Spacers cannot currently be recycled.

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References

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Adding default dosage instruction for Respimat® on Clinical System

a) Vision

b) EMIS

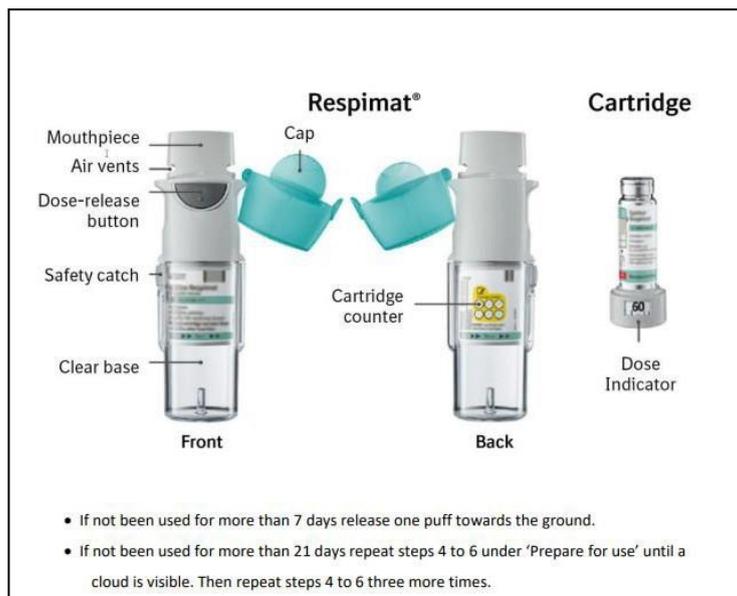
- Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution cartridge with device (Boehringer Ingelheim Ltd)** two puffs twice daily (this device is to be issued twice a year, refill cartridges to be used 6 times with each device), 1 x 60 dose
- Spiolto Respimat 2.5micrograms/dose / 2.5micrograms/dose inhalation solution refill cartridge (Boehringer Ingelheim Ltd)** two puffs daily - refill to use with Spiolto device (can use 6 cartridges with one device, then need to have new device), 2 x 60 dose

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South East London Approved Medicines Optimisation Committee (SEL IMOC). A partnership between NHS organisations in South East London: South East London Clinical Commissioning Group (covering the boroughs of Bexley/Bromley/Greenwich/ Lambeth/Lewisham and Southwark) and GSTFT/KCH /SLaM/ Oxleas NHS Foundation Trusts and Lewisham & Greenwich NHS Trust

Device Information



Source: Boehringer Ingelheim www.medical.respimat.com

When the patient has used an inhaler with 6 cartridges, get a new Respimat® re-usable pack containing an inhaler.



When to replace the Respimat® re-usable cartridge

The dose indicator shows how many puffs remain in the cartridge.



60 puffs remaining



Less than 10 puffs remaining. Obtain a new cartridge.



The cartridge is used up. Turn the clear base to loosen it. The inhaler is now in a locked position. Pull off the cartridge from the inhaler. Insert a new cartridge (continue with step 2).

How to use the re-usable Respimat device with replacement cartridges:

<p>1. Remove clear base</p> <ul style="list-style-type: none"> • Keep the cap closed. • Press the safety catch while pulling off the clear base with the other hand. 		<p>4. Turn</p> <ul style="list-style-type: none"> • Keep the cap closed. • Turn the clear base in the direction of the arrows on the label until it clicks (half a turn). 	
<p>2. Insert cartridge</p> <ul style="list-style-type: none"> • Insert the cartridge into the inhaler. • Place the inhaler on a firm surface and push down firmly until it clicks into place. 		<p>5. Open</p> <ul style="list-style-type: none"> • Open the cap until it snaps fully open. 	
<p>3. Track cartridge</p> <ul style="list-style-type: none"> • Mark the check-box on inhaler's label to track the number of cartridges. • Put the clear base back into place until it clicks. 		<p>6. Press</p> <ul style="list-style-type: none"> • Point the inhaler toward the ground. • Press the dose-release button. • Close the cap. • Repeat steps 4-6 until a cloud is visible. • After a cloud is visible, repeat steps 4-6 three more times. <p>The inhaler is now ready to use and will deliver 60 puffs (30 doses).</p>	

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