

THE POCKET GUIDE TO BEING A GREEN PRESCRIBER: INHALERS



FOR THE RESPIRATORY MULTIDISCIPLINARY TEAM

There are 3 main classes of inhaler devices for the treatment of airways diseases like COPD and asthma;

<p>1.</p>  <p>MDI Pressurised metered-dose inhalers (pMDI)</p>	<p>2.</p>  <p>DPI Dry powdered inhalers (DPI)</p>	<p>3.</p>  <p>SMI Soft mist inhalers (SMI)</p>
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MDIs contain a propellant (hydrofluoroalkanes) which have a **DISPROPORTIONATE GLOBAL WARMING POTENTIAL (GWP)**.

The carbon footprint of MDIs can be **10-30 TIMES GREATER** than that of DPIs and SMIs



The global warming potential of pMDIs varies and depends on the volume of the canister and the type of propellant used.



HF134a and HFA227ea are respectively

1,300 AND 3,350 TIMES MORE POTENT THAN CARBON DIOXIDE.

As prescribers we have a responsibility to be aware of the environmental impact of our actions.

Health care's climate footprint is equivalent to **4.4%** of global net emission.



Ireland is a major emitter of **healthcare emissions**. If the health sector were a country, it would be the **5TH LARGEST EMITTER** on the planet.

The carbon footprint of healthcare in Ireland is equivalent to the total carbon emissions in **Togo** (Population 8 million).

In Ireland, **inhaled medications** are estimated to account for **4% OF HEALTHCARE EMISSIONS** reflecting our high usage of MDIs (60% of prescribed inhalers)



As there is no link between inhaler type and outcomes including mortality, prescribers have a responsibility to **CHOOSE WISELY WHILE TAKING INTO ACCOUNT PATIENT FACTORS**

WHAT EVIDENCE SUPPORTS A MOVE TO LOW CARBON INHALERS?

- The NICE Guidelines encourage the use of greener inhalers and have released [The 2019 Patient Decision Aid on Asthma](#)
- The British Thoracic Society statement on [The Environment and Lung Health 2020](#)
- The ICGP 2020 [Asthma – Diagnosis, Assessment and Management in General Practice Quick Reference Guide](#)
The lower carbon footprint of dry-powder inhalers (DPIs) should be considered alongside other factors for patients who can use these devices effectively.

HOW DO PRESCRIBING PRACTICES IMPACT ON CARBON FOOTPRINT?

- For every 10% of MDIs changed to DPIs, 58,000 tonnes of CO₂e could be saved in England. If changed to the cheapest equivalent DPI, £8.2 million could be saved.
- Addressing SABA use in UK could save 250,000 tonnes of CO₂e. Equivalent to driving a diesel car for 1.5 billion kilometres.
- In a GP practice in Ireland reducing rates of MDI prescribing from 84% to 70% saved enough carbon to charge 3 million mobile phones over six months.

WHAT COULD BE SAVED

For every 10% of MDI changed to DPI in England

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TONNES OF CO₂



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Addressing SABA use in UK
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In Ireland reducing rates of MDI prescribing in a GP practice from 84% to 70%

SAVED ENOUGH CARBON TO **CHARGE 3 MILLION MOBILE PHONES** over six months.



WHAT STEPS CAN CLINICIANS TAKE TO REDUCE THE CARBON FOOTPRINT OF RESPIRATORY CARE AND IMPROVE PATIENT CARE?

1 Check the diagnosis and ensure inhalers are only prescribed where clinically indicated.

2 Address exposures and lifestyle factors which may reduce the need for inhaled medication.

3 When a new inhaler is commenced, aim to choose a DPI or SMI unless a specific clinical or dexterity issue that requires an MDI or Breath actuated inhaler (BAI) is present.

- The majority of patients can safely use a DPI or SMI. [See Table]

4 Where patients are using several classes of inhaler, consider switching all to DPI if clinically appropriate.

5 Where patients are frequently using short acting bronchodilators (SABA)

- Refer to the GOLD, GINA or local guidelines and DO NOT prescribe SABA monotherapy.
- SABA overuse/overreliance should prompt a review of treatment, inhaler technique and adherence.

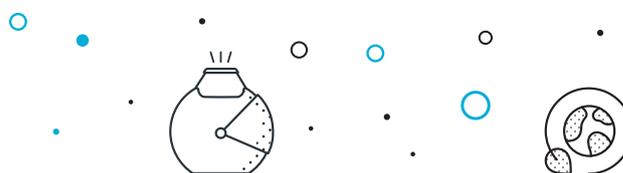
6 When prescribing a SABA MDI for emergency/rescue use prescribe a smaller volume canister (with the same number of doses) with a spacer. [See Table]

7 Take all opportunities to optimise inhaler technique and adherence.



8 Reduce Waste

- Prescribe a spacer device to all patients using an MDI and educate the patient how to correctly use it.
- Educate and support patient's to reduce hoarding and use up existing medication, ensuring that it is within its expiry date.
- Encourage patients to return used inhalers to a Pharmacy participating in the Teva Inhaler Recycling Scheme. Find participating pharmacies [here](#).



To assess a patient's inspiratory flow rate ask a patient to try both of the following inhalation techniques

Quick and Deep: Can the patient take a quick, deep breath in 2-3 seconds?

Slow and Steady: Can the patient take a slow, steady breath in over 4-5 seconds?

Can perform quick and deep: Only consider a DPI

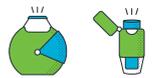
Can perform both: Consider DPI, MDI or SMI

Can perform slow and steady only: Consider MDI or SMI

REMEMBER:

Consider using an MDI in the elderly, children, patients who require assistance with taking their inhaler, or those with cognitive and/or psychomotor deficits.

SCENARIOS

1	A teenager with asthma and good inhaler technique using an MDI presents for a review and wants to use a more environmentally friendly inhaler	Consider a DPI, check they can perform the appropriate technique. Involve the patient and their parents if appropriate in the treatment decision.	
2	An adult with COPD using an MDI presents for review. Their technique is poor. You do not expect them to have very low inspiratory flow.	Consider a switch to a DPI or SMI, provided the patient is agreeable and can perform the technique correctly.	
3	An adult with severe COPD and weak inspiratory effort	Consider a pMDI or SMI with a spacer	
4	An elderly patient presents for COPD review with their carer. They have a cognitive impairment and increasingly their carer assists them with their medications including inhalers.	Consider a pMDI or SMI with Spacer with which the carer can assist the patient.	
5	A young female adult with exercise induced asthma presents for review. She has been using a Ventolin inhaler when preparing for her triathlons.	Consider a switch to a DPI if the patient would prefer a low global warming potential inhaler and can safely use one.	
6	An adult with COPD presents for review. They are currently using two inhalers an MDI and a DPI.	Consider switching the MDI to DPI, if clinically appropriate and so they will only be using one class of inhaler.	

DECISION AID FOR INHALER CHOICE

	INHALER TYPES	GLOBAL WARMING POTENTIAL	INSPIRATORY FLOW REQUIRED	PATIENT IS REQUIRED TO COORDINATE BREATH WITH ACTUATION	PHARYNGEAL DEPOSITION	AIRWAY DEPOSITION
Breath Actuated Metered Dose Inhaler (BAI)	<ul style="list-style-type: none"> Easibreathe Autohaler K-haler 	High	Very Low	No	High	Low
Pressurised Metered Dose Inhaler	<ul style="list-style-type: none"> MDI Evohaler 	High	Very Low	Yes	High	Low
pMDI plus Spacer		High	Very Low	No	Low	High
Dry Powder Inhaler	<ul style="list-style-type: none"> Diskus Easyhaler Ellipta Turbohaler Spiromax Genuair Breezhaler Handihaler Zonda Aerolizer 	Low	Depends on device (See table)	No	Low	High
Soft Mist Inhaler	<ul style="list-style-type: none"> Respimat 	Lower	Very Low	Yes	Low	High

HOW TO HAVE THE CONVERSATION ABOUT MDIs

PRESUMED PATIENT INITIATED BY TELEPHONE CALL OR WITHIN CONSULTATION:

Often triggered by a repeat prescription request. Could also be doctor initiated by spontaneously raising the fact that a patient is on a 'blue' inhaler and the conversation therefore can start with the second dialogue.



- 1. PATIENT**
Doctor, can I have another blue inhaler? (Patient initiated discussion)

DOCTOR
You're on a blue inhaler, but do you have asthma? (Doctor initiated discussion)
- 2. PATIENT**
Ah sure, I only use it now and then for 'the asthma'.

DOCTOR
We've been advised in recent guidelines not to prescribe the blue inhaler alone for asthma.
- 3. PATIENT**
Oh, so what should I do?

DOCTOR
If you come and see me I can discuss a whole load of things you can do to help with breathing, like exercise, diet, air pollution, smoking, inhaler technique - they all play a role!
- 4. PATIENT**
Well, I'm busy at the moment. Can I just have an inhaler?

DOCTOR
We've also realised another thing with the blue inhaler - that the spray inhaler is not that great at getting the drug to your lungs as most ends up in your mouth, so we've found that dry powder inhalers are clinically more effective and easier to use. Have you ever tried one of those?
- 5. PATIENT**
No, are they different?

DOCTOR
Well, they're much the same size and you "click" them to release the powder and then breath in quick and deep, simple as 1, 2, 3. One puff is enough as more drug reaches your lungs with each breath in.
- 6. PATIENT**
Do they cost the same?

DOCTOR
They're much the same cost - maybe €2 or so more but they are both more effective and they don't damage the environment.
- 7. PATIENT**
What do you mean?

DOCTOR
Well, the gas in the spray inhalers (i.e. the blue one) is a powerful greenhouse gas - it has more than 1,000 times the global warming potential of CO₂. One blue inhaler releases the equivalent emissions as a car driving from Dublin to Tralee but the dry powder inhaler is like a return car trip to your local shop.
- 8. PATIENT**
So, what's the inhaler called?

DOCTOR
Ventolin Diskus (or Bricanyl Turbohaler) are the Dry Powder inhaler equivalent versions of the blue inhaler. However, we should consider a steroid inhaler or combination inhaler as a preventer so you do not need the blue inhaler regularly.
- 9. PATIENT**
How will I know how to use it?

DOCTOR
The pharmacist can show you, or if you want I can text or email you a link to a video.
Also remember to dispose of your inhalers properly back with the pharmacist who often has a specific recycling scheme for inhalers.
- 10. PATIENT**
Thanks a million Doctor, I've learnt loads! I will arrange an appointment to check out my asthma and to see if I need another steroid inhaler.



OR FOR THE PATIENT RESISTANT TO CHANGE

PATIENT
Do you know what, I think I'd like to stay with my usual inhaler.

DOCTOR
No worries, I'll give you the same inhaler with the same number of doses, but in a smaller version so there's less of that bad carrier gas (a salbutamol generic version has 1/3 the emissions of Ventolin. Note: "Do not substitute with Ventolin" on prescription.)

INCIDENTAL POINTS OF INFORMATION:

Remember the carbon emissions generated from an MDI is equivalent to a trip from Dublin to Tralee i.e. 280km and is **UNDER OUR CONTROL AS THE PRESCRIBER.**

Ventolin has a large canister so carries more of the hydrofluorocarbon gas. The **GENERIC SALBUTAMOL** versions have a smaller canister and so have a **MUCH LOWER CARBON FOOTPRINT** with the same number of doses.

Dry Powder inhalers are even better with **>1/20 of the CARBON FOOTPRINT** of Ventolin Evohaler ('Blue Inhaler') or 1/10 of the carbon footprint of generic salbutamol inhaler.

