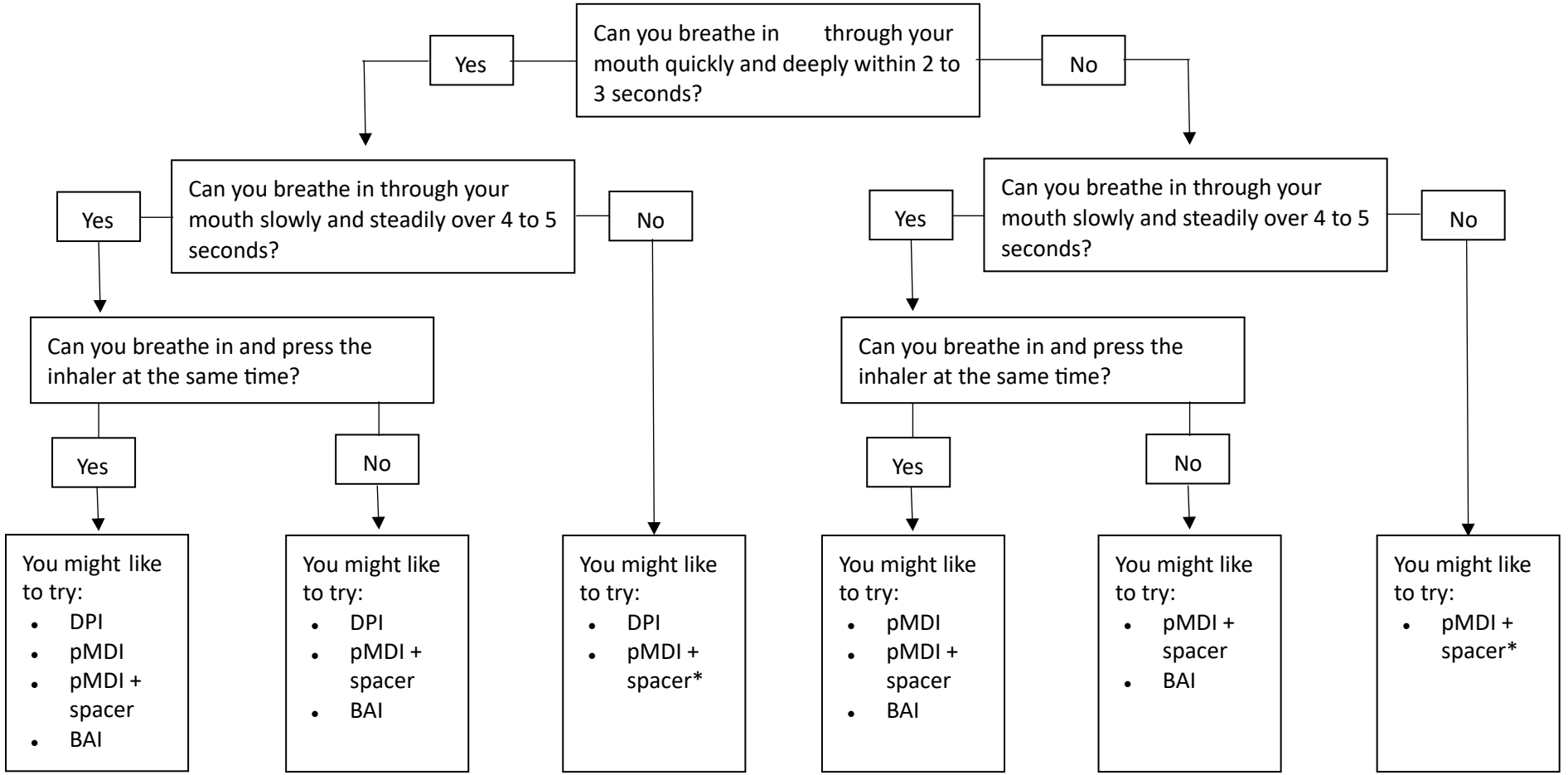
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Inhaler carbon footprint guide

Follow the flowchart to see which inhaler devices options are available



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

Adapted by Suffolk and North East Essex Medicines Optimisation Team from NICE Asthma Patient Decision Aid (NG80), accessed March 2022

Produced by IES Medicines Optimisation Team on behalf of SNEE IMOC
Approved by SNEE IMOC 11/24 Review due: 11/26

- Priority should be to offer an inhaler that will provide the best clinical outcomes for the patient - 'the right inhaler for the right patient'.
- Inhaler technique and inspiratory flow are extremely important in ensuring as much inhaled medication as possible is delivered into the lungs.
- Patients do not need to wait for their annual asthma/COPD review but if it is due then this is an ideal opportunity to discuss low carbon options.

What options are available to lower carbon emissions?

- Use dry powder inhalers as first choice when clinically appropriate. Soft mist inhalers are also preferable to MDIs.
- Choose a low carbon brand – (refer to the formulary)
- Reduce excess prescribing of short acting beta agonists (SABA) – reducing the number of devices prescribed reduces carbon emissions.
- Optimise prescribing where patients could be on a combination inhaler. This will reduce the overall number of inhaler items dispensed and be more convenient for patients, for example:
  ICS + LABA → ICS/LABA (switch to a formulary dual combination inhaler)
  ICS + LABA/LAMA → ICS/LABA/LAMA (switch to a formulary triple combination inhaler).
- Optimise the strength of the inhaler i.e. prescribe 1 puff of 200mcg rather than 2 puffs of 100mcg where licensing allows.
- Where patients still require an MDI – offer a spacer device (refer to the formulary)
- Correct inhaler technique to ensure patients get the most benefit from their inhalers.
- Encourage all patients to return empty and unwanted inhalers to their community pharmacy for disposal.

More information can be found in the Greener Practice "How to Reduce the Carbon Footprint of Inhaler Prescribing. A Guide for Healthcare Professionals in the UK":
Reducing-Carbon-Footprint-of-Inhaler-Prescribing-v3.3.2.pdf (pcdn.co)

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Devices and the inspiration required

Device type. Refer to the local formulary for brands	Inspiration required
Dry powder inhaler (DPI)	Quick and deep
Soft mist inhaler (SMI)	Slow and deep
Breath-actuated metered dose inhaler (BAI)	Slow and steady
Pressurised metered dose inhaler (MDI)	Slow and steady
Pressurised metered dose inhaler (MDI) plus a spacer	Tidal breathing or slow and steady

Key	
	Low (<35 g CO2e) carbon footprint per puff
	High (≥35 g CO2e) carbon footprint per puff

Reference: PrescQIPP Inhaler carbon footprint data 2.10.1

How do I assess a patient's inspiratory flow?

- For most patients, MDIs do not confer any additional clinical advantages over DPIs.
- Inspiratory flow should be discussed. Adults with mild to moderate asthma are likely to be able to demonstrate they have the quick and deep inspiration sufficient for a DPI.
- It may be useful checking inspiratory flow in those with more severe disease or older patients using a device such as the In Check Dial™ or equivalent

The patient decision aid at the top of the page is an algorithm of questions that a patient can help determine which type of device is suitable. Once a device has been agreed with the patient prescribe a **formulary choice** according to the local asthma or COPD guidelines. A dry powder inhaler can be considered in patients over 8 years of age. Refer to the formulary and check the Summary of product characteristics to ensure the inhaler is licensed for the age of the child.

Inhaler technique

Regardless of whether a change in device was made:

- Discuss inhaler technique at every opportunity.
- Demonstrate inhaler technique with placebos where possible.
- Signpost to videos i.e. Right breath, Asthma UK or the myCOPD app
- The community pharmacy can support with inhaler technique and follow up under the Community Pharmacy New Medicines Service (NMS).

Relievers (SABA)

Salbutamol metered dose inhalers (MDIs) are the single biggest source of carbon emissions from NHS medicines prescribing.

- During exacerbations, patients may not have the inspiratory flow required to deliver an effective dose from a reliever in the form of a dry powder device. For these patients a salbutamol MDI prescribed by brand with a formulary spacer should be given.
- Prescribe SABA by brand name and choose a low carbon brand where possible. (see table below). This ensures a lower carbon option is dispensed. If the practice anticipates switching many patients, forewarn the relevant community pharmacies to ensure stock will be available.
- When switching brands of salbutamol, the patient may notice that the propellant feels different in the mouth, they should be reassured that this does not affect the effectiveness of the inhaler.

The table below indicates the carbon footprint of brands of some salbutamol inhalers. Environmental impact of inhalers - average carbon footprint per salbutamol inhaler | OpenPrescribing

Salbutamol Brand (Device)	**Carbon footprint/puff** **Low <35g CO2e** **High≥35gCO2e**
Easyhaler Salbutamol 100mcg (DPI)	0.62
Easyhaler Salbutamol 200mcg (DPI)	0.62
Salamol CFC-free 100mcg	11.95
Salbutamol CFC free 100mcg	25.24
Ventolin Evohaler	28.26

All inhalers have a carbon footprint measured in carbon dioxide equivalents (g CO_2eq). The higher the carbon dioxide equivalent, the greater the impact on global warming.

Reviewing medical records

Before switching a patient inhaler to a lower carbon option, identify those with poor control and offer a full review to optimise their care. Establish where the patient is on the local asthma or COPD guidelines to ensure they are being managed optimally. Check for personalised action plans to promote self-effective management.

Indicators of poor control include:

- Over-use of SABA. Check that any over ordering is not due to inadvertent monthly re-ordering through electronic repeat dispensing or a care home. Please note, electronic repeat dispensing does allow for PRN medications to be ordered at a different frequency to regular monthly repeats.
- Under-use of preventers
- Need for oral prednisolone to manage exacerbations

Follow up appointments

- Patients should be offered a follow up appointment around 6-8 weeks later or sooner if required.
- Patients with asthma or COPD can be referred or they can self-refer to the free Community Pharmacy New Medicines Service (NMS). The service provides support for people with long-term conditions such as asthma or COPD who are newly prescribed a medicine to help them understand their new medicine, improve adherence and will include an opportunity to check inhaler technique.

Disposal

Used MDI canisters still contain propellants that contribute to global warming. Encourage patients to:

- Check dose counters where applicable to ensure the inhaler is empty.
- Return empty/unwanted inhalers to the community pharmacy. Incineration thermally degrades hydrofluoroalkanes (HFA) into far less potent greenhouse gases. Inhalers that end up in landfill release their remaining propellant which leaks HFA into the atmosphere.
- Ensure patients are aware of the expiry date and schools return inhalers at the end of term.
- Spacers cannot currently be recycled. Recommend patients clean and replace them according to manufacturer's instructions.
- For more information on the safe recycling of medicines and inhalers see https://www.recyclenow.com/what-to-do-with/medicines-0