Sheffield Inhaler Device Type Choice Guide

NHS South Yorkshire Integrated Care Board

Inhaler Devices -Top Tips

1. Optimise maintenance treatments for asthma and COPD using guidelines
2. Use dry powder inhalers (DPI) first line where appropriate and agreed with the patient
3. Do not undertake mass switching of inhaler device type (i.e. pMDI to DPI)
4. Carry out any change of device face to face and in agreement with the patient
5. Ensure you can use the devices correctly yourself before attempting to train others
6. Check inspiratory flow rate and ensure patient can replicate correct breath type for chosen device
7. Check the patient can make a good seal around the mouthpiece
8. If a patient cannot use a DPI, it is better for them and the environment to continue with a pMDI (pressurised metered dose inhaler) and use a regimen with the least puffs to deliver the required dose
9. Train patient and demonstrate how to use the device - share videos with patients
10. Assess and optimise inhaler technique at every opportunity
11. Follow up (~6 weeks) after a change of device/medication to assess suitability and disease control
12. Always prescribe inhalers by brand name and device type

When to consider a DPI

- For adults use dry powder inhalers (DPI) first line where appropriate and agreed with the patient
- When a patient cannot or does not use a pMDI effectively (see assessing appropriate breath technique)
- When a patient will not use a spacer device with a pMDI
- When a patient may already be using an effective technique for a DPI but currently using a pMDI (see assessing appropriate breath technique)
- When a patient asks about the environmental impact of their inhaler
- When compliance is poor with current device/regimen (see Appendix 3 for further advice)
- When disease control is poor with current device/regimen

DPIs and Children

DPIs are not suitable for young children as they cannot produce the inspiratory flow required to actuate the dose

pMDI plus spacer remains the preferred delivery method for most children under 12 years.

An appropriate time to consider DPIs for children is towards the end of primary school/before transition to secondary school (age 11/12 years)

Considering DPIs before a child reaches secondary school age may address compliance issues which could arise in this age group (for example not using a spacer due to its indiscrete nature). Ask parents to identify children who have stopped using their spacer device

Carry out an assessment of inspiratory flow to ensure the child can generate the effort required to activate the dose

Switch devices in agreement with the child, face to face and only after demonstrating the device and assessing technique

If a child is at high risk of asthma attacks consider pMDI plus spacer as a backup for emergencies

Always check summary of product characteristics to confirm licensed age for individual devices

Assessing appropriate breath technique

What type of breath can the patient replicate? What type of breath is the patient using with their current inhaler? They may be using the wrong breath type with their current device and could benefit from a device which suits their technique better.

Ask the patient to breathe out comfortably and lift their chin up before trying each of the following breaths:

QUICK AND DEEP → Can the patient take a quick, deep breath in within 2-3 seconds? **CONSIDER DPI**

SlOW AND STEADY → Can the patient take a slow, steady breath in over 3-5 seconds? **CONSIDER pMDI if patient cannot replicate the quick and deep breath required for DPI.**

See Appendix 2 – Explaining to a patient how inhaler technique can affect drug deposition in the lungs

Assessing inspiratory flow rate

Inhaler whistles

Available from some manufacturers free of charge (e.g. AZ for Turbohaler® and GSK for Ellipta®). Can be used to assess and ensure patients are able to inhale at or above the optimal inspiratory flow necessary to be able to use the device correctly.

Placebo devices

Most manufactures provide free of charge placebo devices which can be used to teach patients how to use their inhaler correctly. Some of these (e.g.NEXThaler® and Genuair® have an audible click if the patient has produced the correct inspiratory effort to actuate a dose from the device.

Flo-tone Trainer

A whistle device which attaches to the mouthpiece of a pMDI which can be used to produce a clear positive signal to actuate the pMDI when the correct flow has been achieved. After actuation it can be used to help patients maintain a slow gentle inhalation (slow and steady). These can be prescribed.

In-Check DIAL G16

The device can be used to assesses peak inspiratory flow rate and can simulate the resistance characteristics of a specific inhaler to ensure the patient can inhale through a device at clinically effective inspiratory flow rates

See Appendix 1 In-Check DIAL G16 for further information. For clinician use – not prescribable

Advantages of DPIs

Breath actuated
Less coordination required
Many people can replicate the breath type needed
Small and portable
Lower carbon footprint

Limitations of DPIs

Moderate to high inspiratory effort
Not suitable for young children
May not be suitable in emergencies
Partly sensitive to humidity
Need dose preparation/loading
Care re lactose intolerance

Advantages of pMDIs

Suitable for emergencies (with spacer)
Not dependent on inspiratory flow rate
Low inspiratory effort
portable

Limitations of pMDIs

Coordination of actuation and inhalation essential
Best used with a spacer
High oropharyngeal deposition
Needs to be shaken well before each use
Higher carbon footprint

Videos

Use videos to support inhaler technique training rather than to replace it
How to use your inhaler

Appendix 1 – In-Check DIAL G16

Device flow resistance chart

Icon	Product	Icon	Product	Device Resistance
	Handihaler®		Forspiro®	
	Easyhaler®		Ellipta®	
	NEXThaler®		TurboSpin®	
	Twisthaler®		Diskhaler®(4)	
	Turbohaler® P		Accuhaler®	
	Turbohaler® S		Breezhaler®	
	Clickhaler™		k-haler®	
	Spiromax®		Respimat®	
	GenuAir®			

Please Note:
All trademarks and product names are the property of their respective owners, see IFU booklet for details.

Assessing inspiratory flow rate for clinical efficacy:
Select appropriate resistance setting, inhale through meter, assess achieved flow rate.
For DPIs values between 30-90 L/min are generally associated with clinical efficacy.
For pMDIs values between 20-60 L/min are preferred.
For Handihaler 20 L/min is associated with clinical efficacy.

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Commonly used device flow resistance levels

High	Easyhaler ® - (monotherapy) Handihaler ®
Med High	Easyhaler® (combination) NEXThaler® Turbohaler® (Pulmicort)
Medium	Genuair® Turbohaler® (Symbicort)
Med Low	Ellipta ® Accuhaler ®
Low	Breezhaler®
pMDI	All pMDI's

Information from https://www.haag-streit.com/clement-clarke/products/inhaler-technique/in-check-dial-g16/?no_cache=1

Appendix 2 - Explaining to patients how inhaler technique can affect drug deposition in the lungs

Inhalers can often be tricky for patients to use. Training patients how to use their device, assessing appropriate breath technique and observing the patient demonstrating how they use their device are essential to ensure maximum lung deposition and therefore effect of the inhaled therapy. As well as patients not achieving the best disease control, poor inhaler technique can lead to unnecessary increases in ICS dose[1].

One study showed that overall, 88% of patients use their inhaler device incorrectly, with 91% unable to use a pMDI correctly[2]. This study concluded that most asthmatic patients did not use their inhaler(s) correctly, despite most having confidence in their technique. Patients attributed confidence in their inhaler technique to their belief that their inhaler was effective. In addition, most patients had not been involved in decision making about which inhalation device to use.

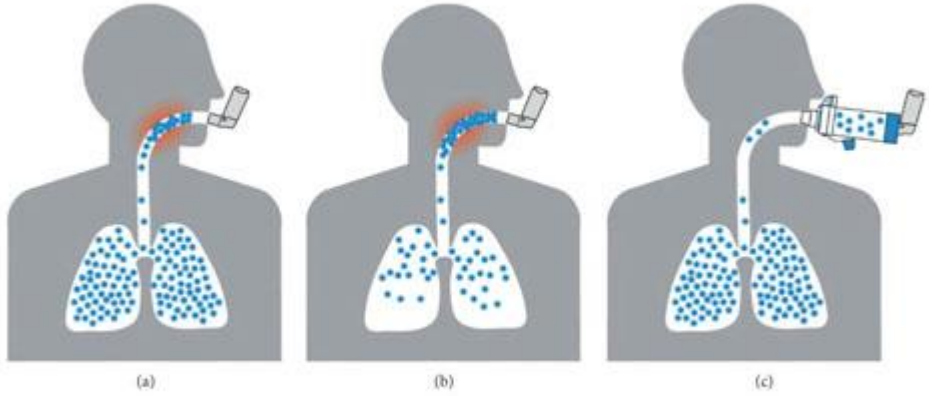


FIGURE 2: Lung deposition of inhaled medication is improved with perfect pMDI technique and with valved holding chamber. (a) Inhaler alone with perfect technique. (b) Inhaler alone with poor technique. (c) Inhaler with valved holding chamber.

Coordination of breath and actuation of a pMDI can be difficult for many patients. An uncoordinated breath and actuation can lead to lower lung deposition and increased oropharyngeal (mouth and throat) deposition[4] which can increase the risk of localised side effects such as oral candidiasis.

The diagram opposite shows the lung deposition of inhaled medication in various scenarios with a pMDI inhaler[3].

Image A shows a high lung deposition for a pMDI used with perfect technique. But we know from the study described above that only 9% of patients can use a pMDI correctly.

Image B shows a low lung deposition from a pMDI with poor technique (91% (most) of patients from the study). We can see that the amount of drug in the lungs is much less so this patient will not get the full benefit from the inhaled medicine.

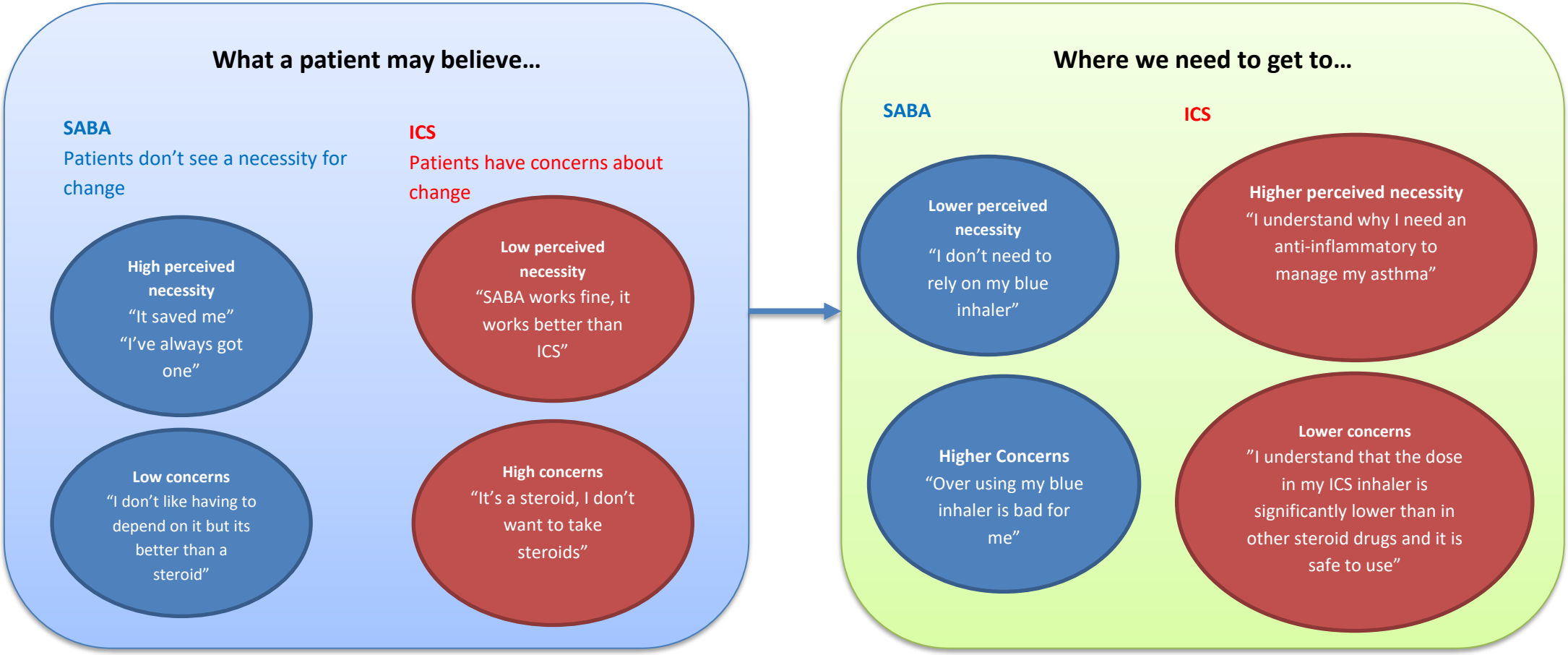
Image C shows us the benefit of using a spacer device with a pMDI. However, a spacer device is only beneficial if the patient will use it!

In addition to this many patients use a quick and deep inhalation with a pMDI whereas the inhalation type which is appropriate for a pMDI is slow and steady over 3-5 seconds. This can be difficult for a patient to replicate which is why dry powder inhalers may be more suitable for many patients. They take away the need for coordination and the ideal breath type for a DPI is quick and deep over 2-3 seconds which is the breath type the patient may already be using with a pMDI. You may wish to start the conversation in a positive way by saying: *"From what you have shown me you have the perfect technique for one of these inhalers (*show DPI's*) this type of inhaler could help you get better asthma/COPD control"*. You may wish to avoid using the term dry powder inhaler with the patient as the term powder may scare them if they believe powders could aggravate their condition. (See patient beliefs in appendix 3) Choose terms like breath actuated inhaler or non-propellant inhaler instead.

Appendix 3 – How a patient's beliefs about inhalers can contribute to poor adherence

An important reason for poor asthma control and consequently, increased healthcare expenditure is suboptimal adherence to the prescribed regimen[5,6]. Non-adherence can have serious consequences to the patient in terms of lost opportunities for health gain with increased morbidity and mortality[7]. The Necessity-Concerns Framework postulates that adherence is influenced by implicit judgements of personal need for the treatment (necessity beliefs) and concerns about the potential adverse consequences of taking it[8].

The Necessity-Concerns Framework and how it relates to inhaler adherence in asthma



Adapted from a presentation by Professor Rob Horne https://www.ipcrg.org/sites/ipcrg/files/content/attachments/2020-06-09/2020-06-06%20Rob%20Horne%20Abstract%20Presentation.pdf)

To hear more on this topic from Professor Rob Horne visit https://vimeo.com/427380220

How do we get to where we need to get to? – Helping to address patient and healthcare professional perceptions, some common things you might hear…

"I only need a blue inhaler – this is the one that will save my life"	"The blue inhaler doesn't treat your asthma, it opens the airways to help you breath better but having asthma means your lungs are inflamed. Using anti-inflammatory medicines will reduce the inflammation over the long-term meaning your lungs will be healthier and less sensitive to triggers. This will also help prevent long term damage to your lungs."
"My blue inhaler works better than a steroid" or "The steroid inhaler doesn't work"	"You might feel almost instant relief from your blue inhaler because it relaxes tightened muscles in your airways but it doesn't treat the inflammation which closes your airways and puts you at risk of an asthma attack. Steroid inhalers reduce this inflammation keeping your airways open and healthy. They take a while to start working though which is why you might not feel any difference straight away."
"I only have asthma when I exercise so I only need a blue inhaler"	"If you get asthma symptoms when exercising this means your asthma is not well controlled meaning exercise triggers your symptoms. Getting good control with a steroid inhaler means you should be able to exercise without getting breathless and you shouldn't need to use the blue inhaler."
"I don't want to take steroids they are dangerous"	"Inhaled corticosteroid doses as considerably lower than in other steroid drugs, they have minimal side effects when taken at the recommended dose and are safe for both adults and children to use. The benefits of taking regular inhaled corticosteroids far outweigh the risks of uncontrolled asthma which could lead to tissue damage in the lungs. Inhaled steroids mimic what hormones do naturally in the body."
"I've been told I won't have the force to use one of those breath actuated inhalers	"There are lots of different inhalers available for us to try, most people do have the effort to use the breath actuated devices and we can check that you can use it with placebo devices and whistles. In fact, many people use the technique, a quick deep breath, that is required for this type of device with a pMDI or canister type inhaler so may get a better effect with a different device. We can check your technique with the different inhalers and see which could be best for you."
"pMDI is the easiest inhaler to use"	"pMDI's are the inhalers we are probably more familiar with but they are pretty tricky to use correctly. A study showed that 9 out of 10 of people used them incorrectly and in another study only 7 out of 100 of healthcare professionals could use them correctly. It's really easy to make mistakes with them because they require coordination and a gentle breath which is sometimes difficult to achieve when something is spraying in your mouth. There is less room for error with many of the breath actuated devices."

"Powder inhalers can't be good for me"

"All inhalers make an aerosol to inhale but different devices make the aerosol in different ways. With these types of inhalers, the medicine is often combined with a carrier, often lactose, to help the medicine flow out of the inhaler. When we breath in the breath makes the force needed for the medicine and the carrier to pull apart. The carrier particles are too big so end up in the mouth or throat and are swallowed/cleared so this is why you might taste the inhaler. The very small particles of medicine reach the right part of your lungs in the form of an aerosol. Rinsing your mouth out after use is always beneficial with inhalers."

"I've used this inhaler for years I know what to do with it"

"You would be surprised how easy it is to make mistakes with inhalers and not even realise. Sometimes this can lead to less of the medicine getting to your lungs where we need it to work. 9 out of 10 people using pMDI inhalers were shown to be making some mistakes in a study even though they thought they were doing it right and believe it or not when healthcare professionals were studied only 7 out of 100 could get it right! Checking inhaler technique regularly is as important as making sure you are on the right medicines because not using them right can mean worse control of your condition and increased side effect."

"I still need a SABA/blue inhaler even though I am on MART"

"When you use a MART regime you use the same inhaler as both your regular maintenance or treatment inhaler and also as your rescue/reliever inhaler so if you need rescue doses you can use your MART inhaler for this as instructed. Most people are able to use their MART inhaler in emergencies too and we don't encourage people to have an additional blue inhaler when they are on a MART regime. In some exceptional circumstances it might be appropriate for you to have ONE blue inhaler and a spacer for emergencies only, but this is not for regular use and should only be used if you are having an asthma attack."

"I have asthma so I expect to be wheezy and breathless"

"The aim of asthma management according to the British Thoracic Society is to achieve complete control. Complete control is no daytime symptoms, no waking up due to asthma, no limitations on activity including exercise and little of no need for rescue medicine. If you are wheezy or breathless with asthma it is a sign that it is not well controlled so we can talk about your inhalers and medicines and look at how we can improve things for you."

"I've been changed from Ventolin to Salamol and it doesn't work as well"

"You will notice that the canister for Salamol is smaller than Ventolin. This is because Salamol contains less propellant but the same amount of medicine. Because Salamol contains less propellant people often say they can't feel it hitting their mouth in the same way as Ventolin and may feel that it is not working as well. Not feeling the inhaler is not a bad thing. Sometimes feeling the pressure of the spray can stop us breathing in the medicine correctly too. Salamol is better for the environment because it contains less propellant which is a greenhouse gas. These gases are not harmful to you."

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