UK Inhaler Group (UKIG) consensus guide on spacer devices

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Introduction

The UK Inhaler Group (UKIG) has produced a practical concise guide to support healthcare professionals in selecting and using spacer and valved holding chamber (VHC) devices for patients with asthma and COPD. Appropriate spacer/VHC selection and use can improve drug delivery, optimise disease control, and reduce treatment-related side effects. The guide highlights that selecting the **right spacer matters** just as much as choosing the right inhaler and that the best device is **one a patient can and will use.** This can lead to **improved symptom control, fewer exacerbations and reduced treatment-related side effects.** This guide aims to support clinicians in making informed, patient-centred decisions that optimise both technique and treatment outcomes.

Why spacers/VHCs matter

- Improved medication delivery to the lungs, reduced oropharyngeal deposition, fewer local side effects.
- Reduces coordination between actuation and inhalation with pressurised metered-dose inhalers (pMDIs).
- Particularly helpful for patients (adults, young people and children) with poor inhaler technique.

The guide highlights:

- There may be clinically significant variation in drug delivery between different brands, due to differences in size, appearance, valve performance, reduction in electrostatic charge and facemask size, shape and material.
- Cost is a consideration however the cheapest spacer/VHC might not be the best device based on multiple factors as outlined in this guide.

Full hands-on assessment of spacer/ VHCs, including patient technique and education, is strongly recommended before making any clinical decision. This is a pragmatic, patient-centred introduction that balances clinical evidence with real-world usability with minor opportunities to sharpen clarity and impact.

Spacer Use

A Consensus Guide

UK INHALER GROUP

The following infographic has been produced as an easy reminder of the importance of spacer devices as part of our essential treatments for asthma and COPD. It has been created by health care professionals for health care professionals and is intended to be a useful guide to some of the important factors that we should consider before choosing a spacer device to support the delivery of medication for people with respiratory diseases. Whilst we put a lot of emphasis on the choice of inhaler device, we need to also consider the importance of the right spacer device for the right inhaler and always one that the person can and will use. An explanation of each prescribing consideration is given on pages 3 to 6.

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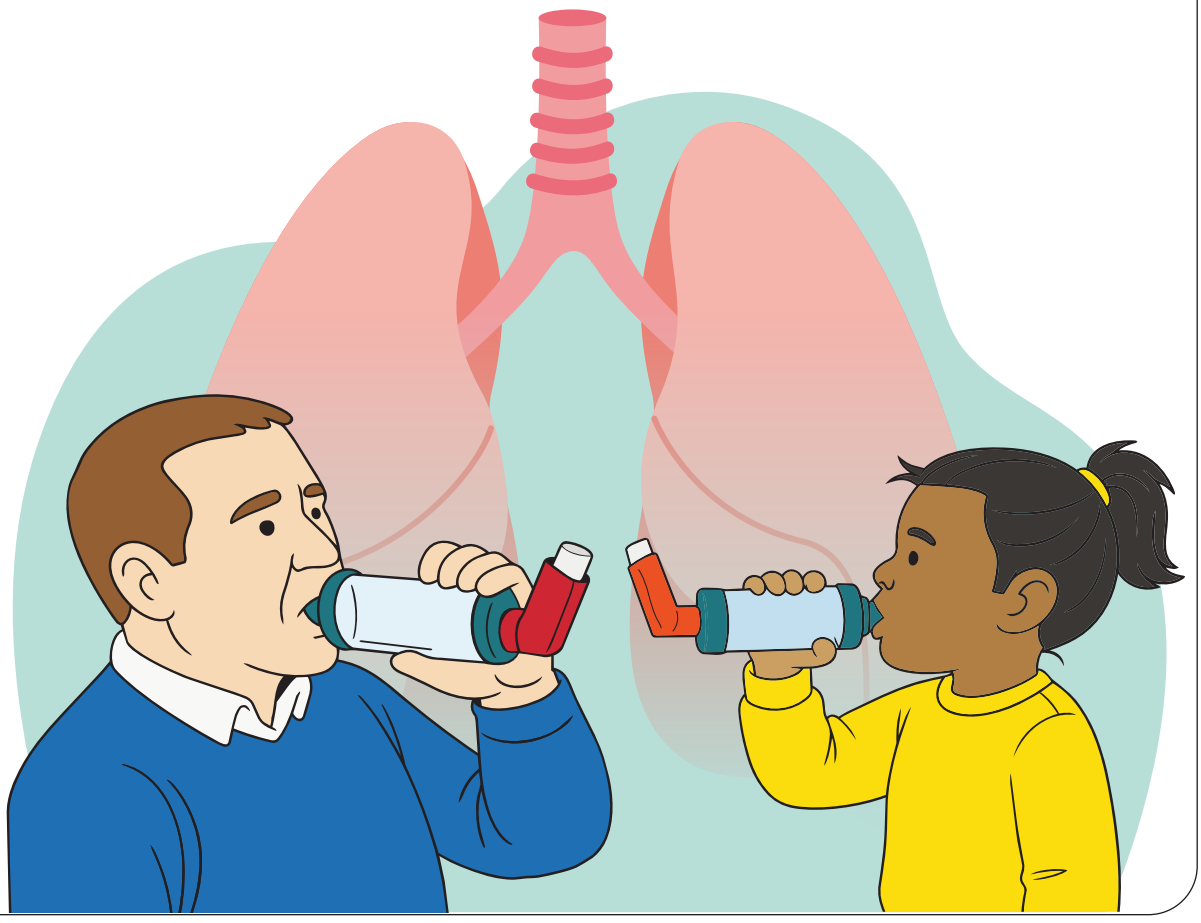
Key Points

- **Choice:** As with any inhaler device choice, the best spacer device is the one that the patient can and will use.
- **Myth:** Spacer devices are only for young children.
- **Risks:** Poor adherence to using pMDIs with a spacer, may reduce lung deposition leading to increased local side effects and poor disease control.
- **Assessment:** Hands on assessment of spacers/Valved Holding Chambers (VHCs) is strongly recommended before making any clinical decision.
- **Consistent Prescribing:** Spacers/VHCs should not be considered interchangeable as there maybe clinically significant variation in drug delivery between different brands, due to differences in size, appearance, valve performance, reduction in electrostatic charge and facemask size, shape and material.
- **Finance:** Cost is a consideration however the cheapest spacer/VHC might not be the best device based on multiple factors as outlined in this guide. Any perceived cost savings may be negated by shortcoming in any of these factors.



Specification

Spacer or Valved Holding Chamber (VHC) - What is the difference?

Although the names are used interchangeably, spacers and VHCs are different.

A spacer, usually small volume (<100mL), is a device placed on the mouthpiece of a pMDI device that simply extends the distance from the patient's mouth, allowing the aerosol plume to decelerate and reducing oropharyngeal deposition.

VHCs are usually bigger with a small or large volume chamber (>100mL to 750mL) and contain a one-way valve that holds the medication suspended in the chamber for an extended time, reducing the need to coordinate actuation and inhalation and allowing patients more timea to inhale their medication.

Both spacers and VHCs have been shown to increase fine particle delivery to the lungs, decrease oropharyngeal deposition, and reduce local side effects commonly seen with the use of pMDIs alone.

Purpose

When should a spacer/VHC be used?

A spacer/VHC should be used for children and adults who are unable to use a pMDI device optimally, often due to poor co-ordination of inhalation and actuation.

Mouthpiece or Mask

Which choice should I make?

A mouthpiece should be used in preference to a mask wherever a patient can achieve a tight seal of their lips around the mouthpiece and inhale slowly and steady over 3 – 5 seconds.

A mask will usually be required for young children <3 years and some elderly adults who are unable to use a mouthpiece, but care should be taken to achieve a tight seal of the whole mask on the face, which can be difficult to achieve in young children or uncooperative patients. If using a mask, the dead space between mouth and valve of the spacer/VHC should be minimised to reduce the amount of drug that is lost and not inhaled.

Static or Antistatic

Is priming of the spacer/VHC required?

Plastic spacers/VHCs are susceptible to electrostatic charging of their inner surface, which attracts aerosol particles resulting in reduced drug delivery.

Some spacers/VHCs have antistatic properties to prevent this effect. Others require priming by spraying multiple doses of a pMDI into the device, or by washing in lukewarm soapy water.

Antistatic spacers/VHCs have the advantage that they do not require drug to be wasted priming the device.

Consult the product literature which will state whether the spacer/VHC is antistatic or not.

Compatibility

Is the spacer/VHC compatible/licensed with a particular inhaler?

Are there clinical and drug delivery/deposition data for the spacer/VHC?

Drugs that can be administered with or without a spacer/VHC are required to provide clinical and drug delivery/deposition data to support their use with named spacers/VHCs, which are then named in the Summary of Product Characteristics.

There may be limited data on the use of alternative spacers/VHCs with different pMDIs to demonstrate equivalent performance.

You can check the summary of product characteristics for each inhaler to find out more.

Sustainability

What is the environmental impact of the spacer/VHC?

The greenest inhaler is the one the patient will use and use effectively. This applies to spacers/VHCs too. Environmental considerations should be secondary to shared clinical decision making to get the right medication delivery device for the right patient.

For formulary and procurement processes, where sustainability credentials are a factor, you could check whether the spacer/VHC has carbon footprint data, a lifecycle analysis, and/or the supplier has completed an NHS Evergreen Assessment.

Practicalities

Feedback Mechanisms

Does the spacer/VHC have a whistle indicator?
A whistle can support good technique, particularly important to highlight if the patient is breathing in correctly for optimal lung deposition. Whistle indicators on spacer/VHC brands can differ: Check - does the whistle sound if inhalation is too fast or too slow?

Does the spacer have a breath flow indicator showing that the patient is breathing in/out?
This is particularly important for parents/carers of people using spacers/VHCs as an indicator that the device is being used correctly.

User-Friendliness

Is it easy to carry?
Patients may choose not to carry a spacer/VHC if it is bulky and inconvenient to carry.

Is it easy to use?
Some devices may be harder for patients to exhale through when tidal breathing.

Some spacers/VHCs may require assembly and include more steps to use, eg: fitting a detachable facemask.

How easy is it to insert an inhaler into the spacer?
Tougher rubber parts may make it more challenging to insert the inhaler into the spacer/VHC.

How easy is it to clean/maintain?
Spacers/VHCs have different cleaning and maintenance instructions. Some are easier to take apart and put back together. Some can be cleaned in the top rack of a dishwasher.

Durability

Has there been any testing of the spacer to show its robustness and are there any parts that could become dislodged or break easily?
Loose or easily breakable parts could reduce the spacer/VHC functionality or become a hazard to patients or family members eg: choke risk.

Cost

How much does the spacer/VHC cost?
Cost consideration should go beyond the unit price and take into account the practicalities outlined above and other factors highlighted within this guide.

Adults

Preference

Is pMDI and spacer/VHC the right combination for the patient?
Correct technique and preference are important when choosing any inhaler device with the patient. Can they use in one inhalation or is tidal breathing required (see education)?

Discussing the benefits of using a spacer/VHC with pMDIs can support informed shared decision making. The combination of pMDI and spacer/VHC may help patients who experience local side effects from their medication, particularly those using higher doses of inhaled corticosteroids.

Cognitive Ability

Is a mouthpiece suitable or would a mask be needed?
Adults do not generally need a mask unless there are underlying issues such as cognitive impairment, learning difficulties or an inability to create a good seal on a mouthpiece.

Carer Support

Does a relative/carer assist with medication?
If so, ensure they understand how to use the device correctly including cleaning, maintenance and replacement.

Children

Mask or Mouthpiece

Is the spacer/VHC age appropriate?

Very young children will need to use a spacer/VHC device with a face mask. Mask size is important - the mask should form a tight seal around the child's nose and mouth. Very young children grow quickly so the mask size needed may change. Most children can use a tidal breathing technique with a mouthpiece rather than a mask from 3-4 years of age. Advise 5 tidal breaths per puff of inhaler and only 1 puff at a time.

Ability

Children tend to master a tidal breathing technique from an early age. The breathing technique itself should be as slow and steady as possible, coaching is helpful as young children tend to go too fast – encourage them to "breathe slowly, right down to your tummy". Communication barriers may be overcome using demonstration, role play, using toys to practice, involving parents, siblings or peers to "have a go too."

Preference

Will the child use the spacer/VHC?

Consider child/parent preference and other convenience factors.

Families and Team Around the Child

All those with caring responsibilities need to know how the child's inhaler and spacer devices are correctly used, stored and maintained.

Education

Inhaler and Spacer Technique

Teaching and checking inhaler technique is of key importance to optimise disease control. This is best achieved through demonstrating correct inhaler technique with the spacer/VHC and can be supported by signposting patients to inhaler technique videos such as at Asthma + Lung UK **https://www.asthmaandlung.org.uk/living-with/inhaler-videos**.

Priming

When is priming needed?

Antistatic spacers/VHCs do not need priming. Others should be primed before use by soaking in lukewarm soapy water for 15 minutes and allowing to air dry in the vertical position, or by spraying multiple doses of a pMDI into the spacer/VHC.

Cleaning

How often should a spacer/VHC be cleaned?

Spacers/VHCs should be cleaned once a week. Disassemble the spacer/VHC and remove the mask (if detachable) if used and soak in lukewarm soapy water for 15 minutes. Shake off excess water, but do not rinse, and leave to air dry in the vertical position.

Replacement

How often should spacer/VHC be replaced?

Spacers/VHCs should be replaced every 12 months, or earlier if damaged or has missing parts.

Review

- **Check Correct Use**
  Observe the patient using their spacer to ensure they are following the correct steps, achieving a good seal, and coordinating inhaler activation with breathing.
- **Demonstration and Support**
  Where needed, demonstrate correct technique in person, and signpost to an appropriate video resource for the patient or carer to review at home.
- **Indicators Working**
  Confirm that any breath flow or whistle indicators are present, easy to see, and being interpreted correctly by the patient to guide inhalation speed.
- **Easy to Handle**
  Ask the patient to demonstrate inserting the inhaler into the spacer, holding it securely, and breathing in and out without difficulty or discomfort.
- **Cleaning**
  Discuss and, if needed, demonstrate the correct cleaning and maintenance routine. Make sure the patient understands how often this should be done and why it matters. Remind patients to wash a new spacer before first use, following manufacturer instructions, and to clean regularly thereafter.
- **Condition**
  Inspect the spacer for cracks, loose fittings, worn seals, or other damage that could affect performance or safety. Check whether the device is more than 12 months old or otherwise in need of replacement.
- **Right Match**
  Ensure the device is compatible with the prescribed inhaler and is licensed for that use.
- **Patient Feedback**
  Invite the patient to share their experience, confidence level, and any challenges they face with daily use.
- **Safety Check**
  Consider any issues that could impact drug delivery, such as poor fit, damage, or changes in patient technique, and address them promptly.

Safety

Many of these issues have been explored previously so here's a quick check list:

- ☐ Is there a range of sizes and masks to suit all ages and requirements?
- ☐ Is the prescription age appropriate?
- ☐ Are the inhaler and spacer compatible?
- ☐ Is it antistatic or does it need pre-treating?
- ☐ Is the cap attached to the mouthpiece?
- ☐ Is there a feedback mechanism to help with correct technique?
- ☐ Does the spacer have any patient safety features?
- ☐ Is there efficacy and effectiveness data?
- ☐ Are there published reliable clinical trials data available with the spacer in people?
- ☐ Is there consistency in the dose delivery?
- ☐ Is there deposition data?
- ☐ What it the inhalation/exhalation resistance of the valves?
- ☐ Is the spacer robust?
- ☐ Is the device disposable or recyclable?
- ☐ Have you taught and reviewed technique with the patient?

Acknowledgements

About this Consensus Guide

Disclaimer: This consensus guide was developed by a UKIG working group and supported by Trudell Medical UK Ltd through the provision of a grant for its production. Trudell Medical UK Ltd had no editorial control other than to check factual accuracy. The views and opinions of the contributors are not necessarily those of Trudell Medical UK Ltd. No part of this publication may be reproduced in any form without the permission of the publisher.

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Date of preparation: December 2025

This guide is endorsed by:

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Association of Respiratory Nurses

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