# *AeroChamber Plus* Flow-Vu** Anti-Static Valved Holding Chamber (VHC)

## Background information for medical media

**The need for Valved Holding Chambers**

- Pressurised Metered Dose Inhalers (pMDIs) are effective devices for the delivery of asthma medication. Unfortunately, user errors with pMDIs are common.[1] pMDIs can be difficult to use as they require the patient to master a perfect technique which requires excellent timing, coordination and breathing technique. Global and UK respiratory guidelines therefore recommend the use of a Valved Holding Chamber (VHC, sometimes referred to as spacer/holding chamber device[2,3,4,5]) to improve pMDI drug delivery.[6,7] However conventional non-anti-static VHCs require preparation before use and regular maintenance is required.[6,7] The majority must be pre-treated by washing in detergent and allowing the device to air dry before first use.[6,7] If the device cannot be pre-treated then priming with at least 20 puffs of salbutamol is recommended.[6]

**Introducing the *AeroChamber Plus* Flow-Vu** Anti-Static VHC**

- The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC is Trudell Medical UK Limited's latest and most advanced VHC. The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC's innovative design provides dose assurance[8,9,10,11] and delivers improved clinical outcomes.[12] This results in real clinical benefits for patients.

**Benefits of *AeroChamber Plus* Flow-Vu** Anti-Static VHC**

**Improved drug delivery and clinical outcomes**

- The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC is proven to deliver the intended dose of medication to patients which compares to using a pMDI alone with perfect technique.[8,9]
- The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC delivers significantly more medicine out of the packet than other available conventional and antistatic VHCs.[10,11,13,14]
- A randomised, double-blind, double-dummy crossover study demonstrated that bronchodilator response increased by 21-25% when using an ***AeroChamber Plus**** Anti-Static VHC compared to a conventional statically charged device.[15]

- A retrospective real-world study in more than 18,000 patients demonstrated superior asthma control with the ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC compared with other VHCs. ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC was associated with a significant delay in time to first exacerbation (p=0.0005).[12] 8,586 patients of this study population could be followed up for 12 months; of these there was a significant 13% reduction in accident & emergency visits (p=0.0167) and a strong trend towards a reduction in hospitalisations (p=0.0702).[12]

**Reduced static**

- The effectiveness of VHCs can be adversely affected by the design and materials used, including the VHC's electrostatic charge, a commonly reported cause of inconsistent medication delivery.[16] Some VHCs use plastic that accumulates static charge[6,7] attracting drug particles that adhere to the wall of the chamber, thereby reducing the amount of drug available for delivery directly to the lung: its site of action.
- The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC is made from an anti-static polymer which prevents electrostatic charge-related loss of medication to the walls of the chamber and allows it to be used straight out of the packet without pre-treatment or priming.[13,17]

**Financial benefits**

- If all people with asthma that use a pMDI plus a VHC in the UK were switched to the ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC, in one year the UK health system could reallocate £7.2m of healthcare resources to other areas of need due to reduced demand by patients with asthma for hospital resources.[18]

**User-friendly features**

- The ***Flow-Vu**** Inhalation Indicator gives caregivers the ability to check there is a proper seal, coordinate actuation with inhalation and count patient breaths. Together this helps provide the user/carer with visual feedback, allowing inhalation technique to be optimised.
    - An *in vivo* study showed the use of a chamber with the ***Flow-Vu**** Inhalation Indicator was associated with improved quality of life (QoL).[19]
    - QoL scores were 4 times greater in the ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC group.[19]
    - Another study demonstrated that a visual indicator for inhalation was associated with increased patient preference.[20]
- The ***FlowSignal**** whistle is fitted to ***AeroChamber Plus* Flow-Vu**** Anti-Static VHCs intended for older children and adults to encourage them to breathe slowly and optimise inhalation technique.[21]

- There are a variety of configurations available, including devices with a mouth piece and an anatomically designed range of **ComfortSeal*** masks, developed to meet the different needs of all ages of this expansive patient population.
- The ***AeroChamber Plus* Flow-Vu*** Anti-Static VHC design also includes the ***EZ Flow**** Exhalation Valve on the mask to direct exhaled air flow away from the patient's face whilst the mask remains in place.
- The ***AeroChamber Plus* Flow-Vu**** Anti-Static VHC is the ideal size chamber for convenience and drug delivery for patients of all ages.[22,23]
- The device can be broken down into 3 parts and is easy to clean.[21]

**The History of the *AeroChamber** brand of VHCs**

- Trudell Medical International launched its first-ever compact VHC in 1983. After its initial launch, the ***AeroChamber**** brand of VHCs was introduced to Europe in 1989.
- Since its launch the ***AeroChamber**** brand of VHCs has been continually updated and improved through Trudell Medical International's state of the art aerosol lab and research centre. The centre employs anatomically correct models with real-life breathing profiles.
- The ***AeroChamber Plus**** brand is the most widely prescribed VHC in the UK[24] with a 76% share of the UK market.[25]

**The benefits of using a VHC**

- In the UK 82% of patients treated for asthma are not well controlled.[26]
- Patients' inhaler inhalation technique has not improved over the past 40 years, with the most frequent pMDI errors being in coordination, speed and/or depth of inspiration and no post-inhalation breath-hold.[1]
- The Global Initiative for Asthma report recommends the use of spacers to improve pMDI drug delivery.[6] In the UK, a joint Scottish Intercollegiate Guidelines Network (SIGN) / British Thoracic Society (BTS) guideline on the management of asthma recommends a pMDI and a spacer as the preferred method of delivery for children; a facemask is recommended for young children, then a mouthpiece when the child is old enough.[7] In addition, the National Institute for Health and Care Excellence (NICE) guidance on inhaler devices for routine treatment of chronic asthma in older children recommends a pMDI with an appropriate spacer as first choice for those aged 5-15.[27] The SIGN/BTS guideline also recommends a spacer for adults receiving high doses of inhaled corticosteroid.[7]
- Using a pMDI with a VHC improves medication delivery[28] and patients who use a VHC with their pMDI have been shown to have better asthma control.[29]

- VHCs were designed to hold the aerosol in the chamber until the patient is ready to inhale, which reduces the need for good coordination between inhalation and inhaler actuation, and to reduce the oropharyngeal deposition,[28] meaning the medication gets into the patient's lungs.
- VHCs are recommended for emergency use.
    - A pMDI and spacer is at least as good as a nebuliser at treating mild and moderate asthma attacks in children and adults.[7]
    - Children receiving $\beta_2$ agonists via a pMDI and spacer are less likely to have tachycardia and hypoxia.[7]

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