AeroChamber Plus*

Valved Holding Chamber (VHC)

01 Current Clinical Guidance on Holding Chambers

International guidelines for the management of asthma and COPD all recommend the inhaled route as the preferred method of delivery for medications to treat asthma and COPD.[1] In infants and pre-school children, a pMDI used with a holding chamber and facemask is recommended as the device of choice while a pMDI used with a holding chamber and mouthpiece is recommended for those above 4 – 6 years of age as the guidelines draw attention to the requirement for co-ordination of actuation of the pMDI and inhalation. Both the elderly and children are recommended to use a holding chamber if there are persistent local oropharyngeal side-effects associated with inhaled glucocorticosteroids. The use of a holding chamber by COPD patients is also recommended because COPD patients may have more problems with co-ordination than patients with asthma, because COPD generally affects an older segment of the population.

Three main factors affect aerosol delivery via a holding chamber: holding chamber characteristics; the characteristic of the specific pMDI being used in conjunction with the holding chamber; and the characteristics of the patient who uses the holding chamber.

02 *AeroChamber Plus** Valved Holding Chamber (VHC) Characteristics

The ***AeroChamber Plus**** VHC devices are suitable for use with tidal breathing[2]. All four of the ***AeroChamber Plus**** VHC devices are designed with a one-way, low resistance inhalation valve, which opens easily at low inspiratory flow rates. The ***EZ Flow**** exhalation valve offers low resistance to exhaled flow making the device suitable for tidal breathing. The exhalation valve directs exhaled medication away from the patient's face and eyes.

Barry et al[3] measured aerosol clearance from five different holding chambers, two small volume (< 200ml); the Babyhaler and ***AeroChamber**** VHC, and three large volume (>700ml); Volumatic†, Nebuhaler† and Fisonair† holding chambers. The study demonstrated more efficient clearance of aerosol from the ***AeroChamber**** VHC at lower tidal volumes (<300ml), with aerosol still visible in the three larger spacers after 20 seconds (seven breaths). The study suggests that differences in holding chamber design and volume may affect clearance of aerosol from spacers, and may mean that large volume spacers are less efficient for use by patients with small tidal volumes.

03 *AeroChamber Plus** VHC Universal Backpiece accepts all commonly prescribed pMDIs

Its oval shape, and flexible yet resilient material, ensures that the ***AeroChamber Plus**** VHC backpiece is compatible with all commonly prescribed inhalers from pharmaceutical manufacturers – including the larger than average mouthpiece of Airomir† and QVAR† HFA metered dose inhalers.

In addition, the ***AeroChamber Plus**** VHC backpiece has been subject to rigorous wear and abrasion testing over and above what is considered to be normal use, without adverse effect.

Easy to **Use** … Easy to **Learn** … **Most Preferred**.[7]

AeroChamber Plus* Valved Holding Chambers are manufactured in Canada by:

Trudell Medical International*

725 Third Street, London, Ontario, Canada N5V 5G4
Email: customerservice@trudellmed.com
www.trudellmed.com

AeroChamber Plus*

Valved Holding Chamber (VHC)

04 *AeroChamber Plus** VHC *ComfortSeal** Mask provides critical facemask seal

Differences in mask design have been shown to affect the amount of aerosol deposited on the face and in the eyes[4]. A recent study using a model of the upper airways and face showed the importance of maintaining a good seal between the face and the mask[5]. The data showed that the lung dose was substantially reduced when the leak occurred near the nose compared with the chin area.

The ***ComfortSeal**** mask on the ***AeroChamber Plus**** VHC infant, child and adult products provide a superior mask fit through a snug, secure seal which limits the entrainment of ambient air even in low inspiratory flow patients. The ***ComfortSeal**** mask is made of medical grade silicone to safeguard against facial irritation.

05 Proven dosing performance across a wide range of formulations

All valved holding chambers have different drug delivery characteristics based on device design and drug formulation. This means, that while physicians and their patients trust the prescribed VHC to deliver the required therapeutic dose, many holding chambers on the market today actually underperform by delivering a lower respirable dose of medication that is less than the ***AeroChamber Plus**** VHC. A dangerous reality, one that presents a potential risk to patients by underdosing and a greater cost to our health care system.

Only ***AeroChamber Plus**** VHC offers consistent delivery over all drug formulations, including the new HFA formulations, and is backed by over 18 years of peer-reviewed data on particle size, performance, and patient outcomes.

06 Proven HFA Clinical Performance

AeroChamber Plus* VHC is the only valved holding chamber that is clinically proven to offer the equivalent drug delivery performance for both CFC and HFA Albuterol formulations.[6] This recent testament, coupled with the over 300 published studies in support of the ***AeroChamber**** brand, should leave no doubt that patients are receiving the required indicated dose when they use the ***AeroChamber Plus**** VHC.

07 The only Valved Holding Chamber line that considers the specific needs of pediatric, adult, and geriatric patient populations.

Instead of adhering to the "one chamber for all" philosophy adopted by competitive products, each ***AeroChamber Plus**** VHC is tailored to meet the distinct needs of a specific patient type. This is important for pediatric patients in particular, and becomes especially critical during periods of exacerbation when diminished breathing capacities necessitate a lower inspiratory valve resistance in order to ensure that these patients receive the full indicated dose.

[1]GINA, 2003; NIH, 2002; BTS, 2004; GOLD, 2003; CACG 2004. [2]Mitchell JP et al. **Delivery of Beclomethasone Dipropionate (BDP) as a Function of Number of Breaths at Low Tidal Volume in Two Small Volume Holding Chambers for Pediatric Use.** Eur. Resp. J., 9S23, 433, 1996. [3]Barry PW et al. **The effect of breathing pattern on clearance of aerosol from spacers.** Eur. Respir J. 1996c; 9 (Suppl 123):432s [4]Sangwan S et al. **Facemasks and facial deposition of aerosols.** Pediat Pulmonol, May 2004. [5]Esposito-Festen JE et al. **Effect of a facemask leak on aerosol delivery from a pMDI-spacer system.** J Aerosol Med, Feb, 2004. [6]R.C.Ahrens, MD, M.E.Teresi, PharmD, C.R.Lux, RRT and Y.Tan, MS, University of Iowa, Iowa City, Iowa. **A Comparison of the Bronchoprotective Effect of CFC- and HFA-Albuterol Metered-Dose Inhalers (MDIs) Used in Combination with the AeroChamber Plus.** Presented at the American Thoracic Society Conference 2003. [7]NOP Healthcare, UK, March 2000.

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AeroChamber Plus*
Valved Holding Chamber (VHC)

0 – 18 months

AeroChamber Plus* VHC with Infant Mask

- Latex-free child or infant ***ComfortSeal**** Mask minimizes dead space, and provides a comfortable, secure fit
- Low resistance inhalation and exhalation valves – especially important for young children with lower tidal volumes
- Universal pMDI adapter fits all commonly prescribed inhalers
- Fun and child-friendly ***AeroBear**** instructional graphics

12 months – 5 years

AeroChamber Plus* VHC with Child Mask

5 years +

AeroChamber Plus* VHC with Adult Mask

- ***FLOWSIGnal**** whistle encourages the proper inhalation technique
- Universal pMDI adapter fits all commonly prescribed inhalers
- Adult mask chamber available for use where required

5 years +

AeroChamber Plus* VHC with Mouthpiece

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AeroChamber Plus*

Valved Holding Chamber (VHC)

Feature	 ***AeroChamber Plus**** VHC	 Volumatic†
Manufacturer	Trudell Medical International	GlaxoSmithKline
Durability	✓	✓
Flow Rate Alarm	✓ ***FLOWSIGnal**** Whistle alerts patient to excessive inspiratory flow rates (adult version)	✗
Permanent Instructions on unit	✓	✗
In Vitro Data	Comparable dosing performance across widely used MDIs	
Compatible with most pMDIs	✓	✗
Recommended replacement	Replace after 12 months	Replace after 6 – 12 months
Mask	3 different sizes of latex free, ***ComfortSeal**** Masks – infant, child and adult	1 size of paediatric mask
Internal Volume	149 mL	750 mL

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AeroChamber Plus*
Valved Holding Chamber (VHC)

Directions for cleaning and usage are very similar for Volumatic† and ***AeroChamber Plus**** VHC making the transition an easy one.

It is important to read ***AeroChamber Plus**** VHC Directions for Use prior to using, and to note the following important differences …

	 ***AeroChamber Plus**** VHC	 Volumatic† VHC
Assembly	None required. Each device is ready to use.	The 2 part chamber must be assembled and if required, the mask installed.
Pre-Washing	Pre-wash the entire device according to instructions.	Pre-wash the mask only according to instructions.
Treatment Time for Children	5 breaths. The small volume chamber takes less time to empty.	Up to 30 seconds if possible.
Treatment Time for Adults	1 long breath and hold or 2 – 3 normal breaths.	1 long breath and hold or 5 normal breaths.
FLOWSIGnal* Whistle	Slow down inhalation if you hear the whistle sound (adult version).	No whistle included.
pMDI Adaptor	The flexible polymer adaptor allows for easy insertion of pMDI and provides a good seal while in use.	Rigid plastic only compatible with GSK pMDI's.

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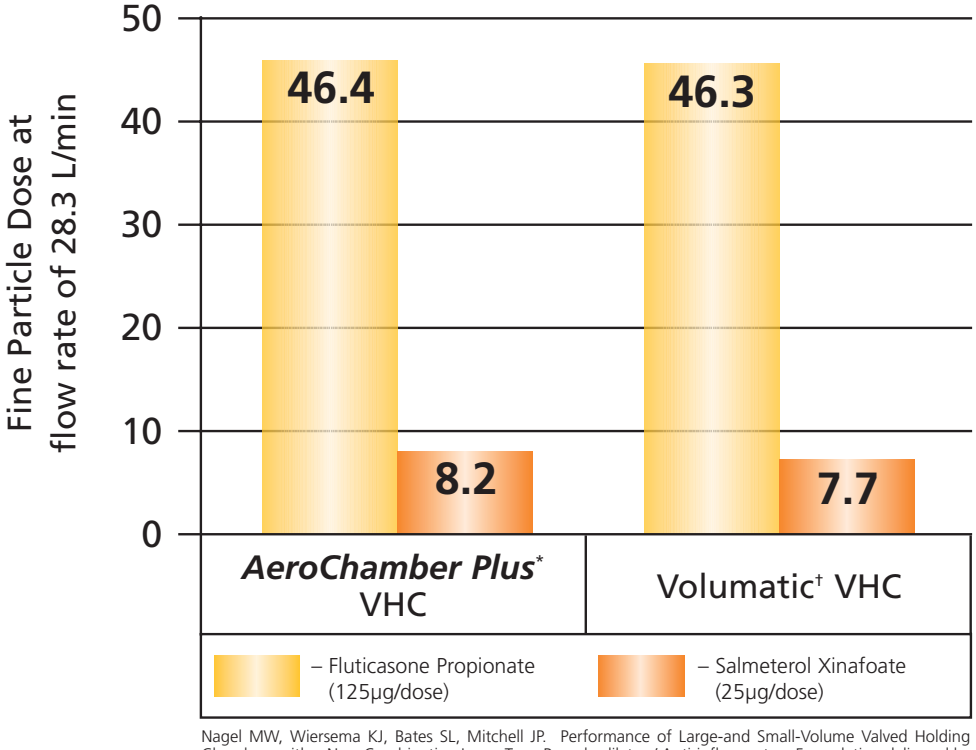
AeroChamber Plus*
Valved Holding Chamber (VHC)

COMPARISON OF VOLUMATIC† VHC WITH ***AEROCHAMBER PLUS**** VHC (MOUTHPIECE) USING SERETIDE† (HFA FORMULATED FLUTICASONE PROPIONATE AND SALMETEROL XINAFOATE)



Nagel MW, Wiersema KJ, Bates SL, Mitchell JP. Performance of Large-and Small-Volume Valved Holding Chambers with a New Combination Long–Term Bronchodilator / Anti-inflammatory Formulation delivered by Pressurized Metered Dose Inhaler. Journal of Aerosol Medicine, Vol. 15, #4, 2002. pp427–433

The ***AeroChamber Plus**** VHC and the Volumatic† show equivalent in vitro performance. However, the ***AeroChamber Plus**** VHC has the advantage of patient preference in terms of device usage.

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