



Mouthpiece

For **dose assurance** and **improved clinical outcomes** prescribe the **AEROCHAMBER PLUS® FLOW-VU®** chamber for your patients.

Different chambers deliver different amounts of MDI medication and this may affect the safety and efficacy of the treatment.^{1,2}

CLINICAL REFERENCES

Role and Benefits

Chambers have an important clinical role to play in the delivery of inhaler medication.

SUMMARY: Review article summarizes the role of valved holding chambers (VHC). Highlights the fact that chambers are not all the same and should not be considered interchangeable.

Optimizing the Delivery of Inhaled Medication for Respiratory Patients: The Role of Valved Holding Chambers. McIvor RA *et al.* Canadian Respiratory Journal, 2018, Article ID 5076259.



Small Mask

AEROCHAMBER PLUS® FLOW-VU® anti-static Valved Holding Chamber (aVHC) significantly reduces the amount of medication deposited in the oropharynx, minimizing the risk of side effects.

SUMMARY: Compared oropharyngeal and lung deposition of both a suspension MDI (Flovent®) and a solution MDI (Qvar®) alone and with the addition of a chamber. The use of the AEROCHAMBER PLUS® FLOW-VU® aVHC reduced oropharyngeal deposition from 62% to 7% of dosage for the suspension formulation and from 29% to 3% for the solution formulation MDI.

Assessment of Potential Mouth/Throat Deposition and Lung Delivery of Suspension- and Solution Formulated Inhaled Corticosteroid Formulations Delivered by Pressurized Metered Dose Inhaler without and with Valved Holding Chamber Using an Anatomic Adult Upper Airway. Suggett J *et al.* Drug Delivery to the Lungs 28, Dec 2017.



Medium Mask

AEROCHAMBER PLUS® FLOW-VU® aVHC provides consistent medication availability even with a delay.

SUMMARY: If using an MDI alone, even a short half second inhalation delay reduces the predicted lung delivery to approximately 1% of the intended dose. The AEROCHAMBER PLUS® FLOW-VU® chamber holds the medication suspended for an extended period of time, allowing patients more time to inhale their medication.

The Impact of Inhalation Delay on Lung Drug Delivery: Using Functional Respiratory Imaging to Compare Metered Dose Inhaler (MDI) and MDI + Valved Holding Chamber (VHC) Systems. J. Suggett, *et al.* Am J Respir Crit Care Med 2020;201:A5689.



Intermediate Mask

SUMMARY: Evaluated the impact of delay on respirable dose for a number of anti-static chambers. Fine particle mass (available for delivery to the lungs) was highest with the AEROCHAMBER PLUS® FLOW-VU® aVHC regardless of delay interval. Even after a 10 second delay, the respirable dose was still within 20% of the intended dose (MDI alone with no delay).

Anti-static Valved Holding Chambers do not necessarily offer similar aerosol delivery performance. Suggett J *et al.* European Respiratory Society Annual Congress, September 2013.

The use of AEROCHAMBER PLUS® FLOW-VU® aVHC optimizes the delivery of medication to the lungs for patients with poor inhalation technique.

SUMMARY: In people with poor inhalation technique, the use of the AEROCHAMBER PLUS® FLOW-VU® aVHC increased the bioavailability of Symbicort® MDI to the same level observed in people with good inhalation technique without a chamber.

Effect of a spacer on total systemic and lung bioavailability in healthy volunteers and *in vitro* performance of the Symbicort (budesonide/formoterol) pressurized metered dose inhaler. Gillen M *et al.* Accepted for publication August 2018 by Pulmonary Pharmacology & Therapeutics.



Large Mask

Superior
Performance



CLINICAL SUMMARY

Valved Holding Chambers are not all equivalent in performance and as a result should not be regarded as interchangeable.

SUMMARY: Spacers and VHCs are not all the same, and also are not interchangeable: the performance may vary according to their size, shape, material of manufacture and propensity to become electrostatically charged, their mode of interface with the patient, and the presence or otherwise of valves and feedback devices. In this article, the authors discuss the risk potential for a patient getting switched to a spacer or VHC that delivers reduced dose medication.

Spacers and valved holding chambers—The risk of switching to different chambers. Lavorini F, *et al.* Allergy Clin Immun Pract. 2020 May;8(5):1569-1573.

SUMMARY: Only AEROCHAMBER PLUS[®] FLOW-VU[®] chambers were equivalent to the reference device data listed in virtually all innovator inhalers currently approved in the US and European markets. The compact Space Chamber[†], InspiraChamber[†] and OptiChamber Diamond[†] were not equivalent to the reference chamber. The respirable dose emitted from these chambers was approximately half that of the reference device with a corresponding doubling of the mass retained within the chamber. Differences in chamber design, materials and function mean that chambers should not be automatically considered interchangeable.

Are valved holding chambers interchangeable? An *in vitro* evaluation of VHC equivalence. Dissanayake S *et al.* Pulmonary Pharmacology & Therapeutics 2018;48:179-184.

Different chambers deliver different amounts of medication which can lead to meaningful differences in clinical performance. Overt advantages suggested for the AEROCHAMBER PLUS[®] FLOW-VU[®] aVHC compared to other chambers.

SUMMARY: Examined available data regarding chambers to determine whether meaningful differences exist between chambers with a focus on AEROCHAMBER PLUS[®] FLOW-VU[®] aVHC. Author found that it was unequivocal that differences exist between different chambers which in a number of cases are sufficiently large that meaningful and overt clinical differences would be anticipated as a result.

A review of the *in vitro* and *in vivo* valved holding chamber (VHC) literature with a focus on the AEROCHAMBER PLUS[®] FLOW-VU[®] anti-static VHC. Dissanayake S *et al.* Therapeutic Advances in Respiratory Disease 2018;12:1-14.

Use of the anti-static AEROCHAMBER PLUS[®] FLOW-VU[®] aVHC may result in better asthma control compared to other chambers.

SUMMARY: Use of the anti-static AEROCHAMBER PLUS[®] FLOW-VU[®] chamber was associated with delayed time to first exacerbation ($p=0.0005$), a 13% reduction in ER visits ($p=0.017$), a 19% reduction in hospitalizations ($p=0.070$).

A retrospective study of the effectiveness of the AEROCHAMBER PLUS[®] FLOW-VU[®] anti-static valved holding chamber for asthma control. Burudpakdee *et al.* Pulmonary Therapy 2017;3(2):283-296.

The exclusive FLOW-VU[®] Inhalation Indicator increases caregiver quality of life ($p=0.029$).

SUMMARY: In vivo study of 80 children (age 1-5 years) with asthma to determine parent preference and patient outcomes when using AEROCHAMBER PLUS[®] chamber and the AEROCHAMBER PLUS[®] FLOW-VU[®] aVHC. Asthma control was the same for both groups demonstrating clinical equivalency. Perceived quality of life increased significantly (4x) for the families of patients using the chamber with FLOW-VU[®] Indicator.

Evaluation of Asthma Control, Parents Quality of Life and preference between AEROCHAMBER PLUS[®] and AEROCHAMBER PLUS[®] FLOW-VU[®] Spacers in Young Children with Asthma. Ammari WG *et al.* Journal of Asthma Vol 52;3,2015.

1 Dissanayake S *et al.* A review of the *in vitro* and *in vivo* valved holding chamber (VHC) literature with a focus on the AEROCHAMBER PLUS[®] FLOW-VU[®] Anti-static VHC. Therapeutic Advances in Respiratory Disease 2018; 12:1-14.

2 Drug Safety Update – Inhaled products that contain corticosteroids, July 2008. Medicines and Healthcare Products Regulatory Agency.

For a comprehensive overview of published studies, refer to the full Study Summary.