

# Evaluation of Real-World Usability and Safety Factors for Valved Holding Chambers (VHCs)

Patel J., Nagel, M., & Suggett, J.  
Trudell Medical International

## RATIONALE

VHCs, sometimes called Spacers, are designed to assist with the coordinated delivery of Metered Dose Inhalers (MDIs) and reduce oropharyngeal drug deposition. Their drug delivery performance should be well understood and clinically validated. In addition, it is important to understand patient usability and safety factors. This study compared a number of VHCs for such factors.

## METHODS

The following VHCs were evaluated ( $n=6$ /group): **AeroChamber Plus<sup>+</sup> Flow-Vu<sup>+</sup> VHC (AC)**; Vortex<sup>+</sup> (VOR); SpaceChamber<sup>+</sup> Compact (SC); EasyChamber<sup>+</sup> (EC); OptiChamber<sup>+</sup> Diamond (OD); Able Spacer<sup>+</sup> (AS); Volumatic<sup>+</sup> (VOL). Each VHC was assessed in terms of a) Ease of tidal breathing, b) Presence of inhalation feedback, c) Dishwasher cleanable, d) Robustness and e) Tamper resistant valves.

RESULTS	AC	AS	EC	OD	SC	VOL	VOR
							
Able to easily breathe tidally (ref. valve resistances)	✓	✓	✗ (high exhalation resistance)	✓	✓	✓	✓
Inhalation Visual Feedback Indicator	✓ 	✗	✗	✗	Valve movement	✗	✗
Dishwasher safe (ref. device instructions)	✓	✗	✗	✗	✓	✗	✓
Robustness (drop test to CSA standard - Canadian Standards Association standard CAN/CSA/Z264.1-02:2002: Spacers and holding chambers used with pressurized metered-dose inhalers.)	✓	✗ 	✗ 	✗ 	✗ 	✗ 	✗ 
Tamper Resistant valves	✓ 	✓	✗ 	✗ 	✓	✓	✗ 

## CONCLUSIONS

Review of the results table highlights many differences between the various spacers on test, with one spacer demonstrating positive aspects for all features assessed and one other having all negative. This highlights the need for health care professionals to consider such real-world features when choosing which device to recommend, in addition to proven clinical validation.