Aerosol Delivery Differences and Cost Analysis of Wasted Medication under Clinically Relevant Test Methods Using a Valved Holding Chamber with Facemask and Fluticasone Propionate

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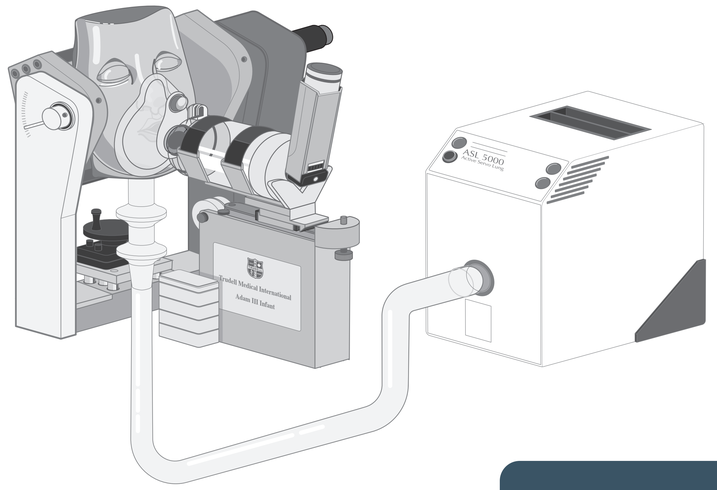
RATIONALE

- Global asthma guidelines highlight the importance of using a valved holding chamber (VHC) with documented efficacy in young children, specifically noting the fact that the dose delivered may vary considerably between VHCs used.
- The recent transition of fluticasone propionate (FP) to an authorized generic has significant cost implications for patients who rely on this inhaler for disease management.
- **The objective of this study was to evaluate the performance of four different VHCs available in the US market and to assess delivery differences to the carina and estimate potential cost impact.**

METHODS

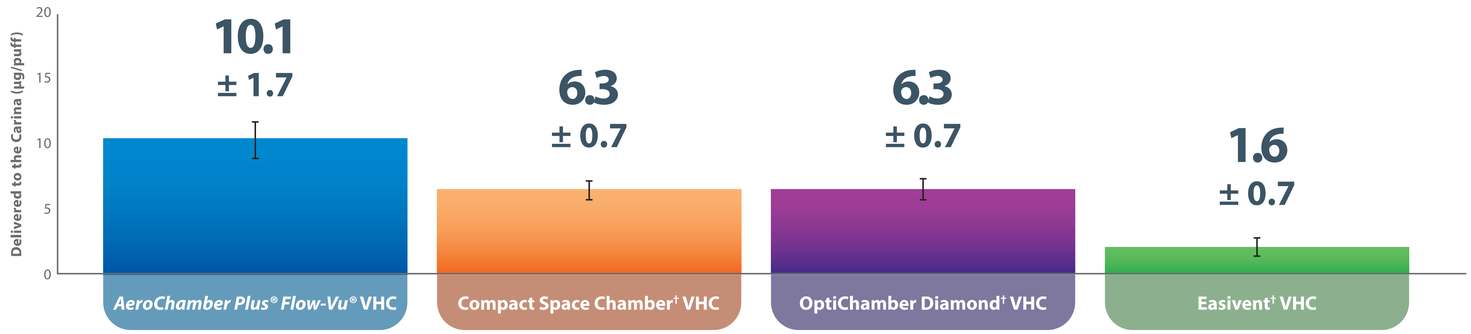
- 4 VHCs evaluated by breathing simulator (tidal volume=155 mL, I:E ratio=1:2, rate=25 cycles/min).
- Facemask of each spacer (n=3) attached to ADAM III, an anatomically realistic oro-naso-pharynx model of a 4-year-old child and the airway coupled to a breathing simulator via a filter to capture drug particles that penetrated as far as the carina.



- 5-actuations of fluticasone propionate HFA (44µg, Prasco Laboratories) were delivered at 30-s intervals and recovered from specific locations in the aerosol pathway by HPLC.
- Comparisons were then made on drug delivery data looking at potential dose to the lungs for each pMDI/VHC.
- This potential delivery was then equated to an estimated savings using the most efficient VHC based upon published costs[1] that Prasco fluticasone propionate HFA 44 has a cost of $90.61 per inhaler.

RESULTS

Recovered FP from each type of VHC and associated implications.



	Delivery to Carina (µg/puff)	Wasted medication (µg/puff)	Potential Value of lost medication (USD$) - monthly
AeroChamber Plus® Flow-Vu® VHC with Medium Mask	10.1±1.7	0	$0.00
Compact Space Chamber† VHC with Medium Mask	6.3±0.7	3.8	$34.09
OptiChamber Diamond† VHC with Medium Mask	6.3±0.7	3.8	$34.09
Easivent† VHC with Medium Mask	1.6±0.7	8.5	$76.26

CONCLUSIONS

- The choice of pMDI/VHC system can significantly impact medication delivery, which in turn affects the overall cost efficiency of therapy.
- In this case, using the ***AeroChamber Plus® Flow-Vu®*** VHC may improve medication cost efficiency by up to five times compared to other VHC options.
- By enhancing the amount of medication that reaches the lungs with each puff, patients may experience better disease control and require less reliever medication.

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[1] Accessed 30th Oct,2024 https://www.goodrx.com/flovent?form=hfa-inhaler&dosage=44mcg&quantity=1&label_override=fluticasone-propionate-hfa

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