

# Effect of Delayed Inhalation on Fine Particle Dose from Two Valved Holding Chambers

Mark Nagel, Jason Suggett  
Trudell Medical International, London, Canada.

## Rationale

- Pressurized Metered Dose Inhalers (pMDIs) are effective means for generating drug-containing aerosols for rapid delivery to the intrapulmonary airways.
- Reduced medication delivery due to delays between pMDI actuation and inhalation can be mitigated by adding a Valved Holding Chamber (VHC) to the inhaler mouthpiece.
- This *in vitro* study compared the efficiency of drug output through a new device (**AeroChamber2go**<sup>\*</sup> (AC2GO)) and **AeroChamber Plus**<sup>\*</sup> **Flow-Vu**<sup>\*</sup> (AC+FV) VHCs.

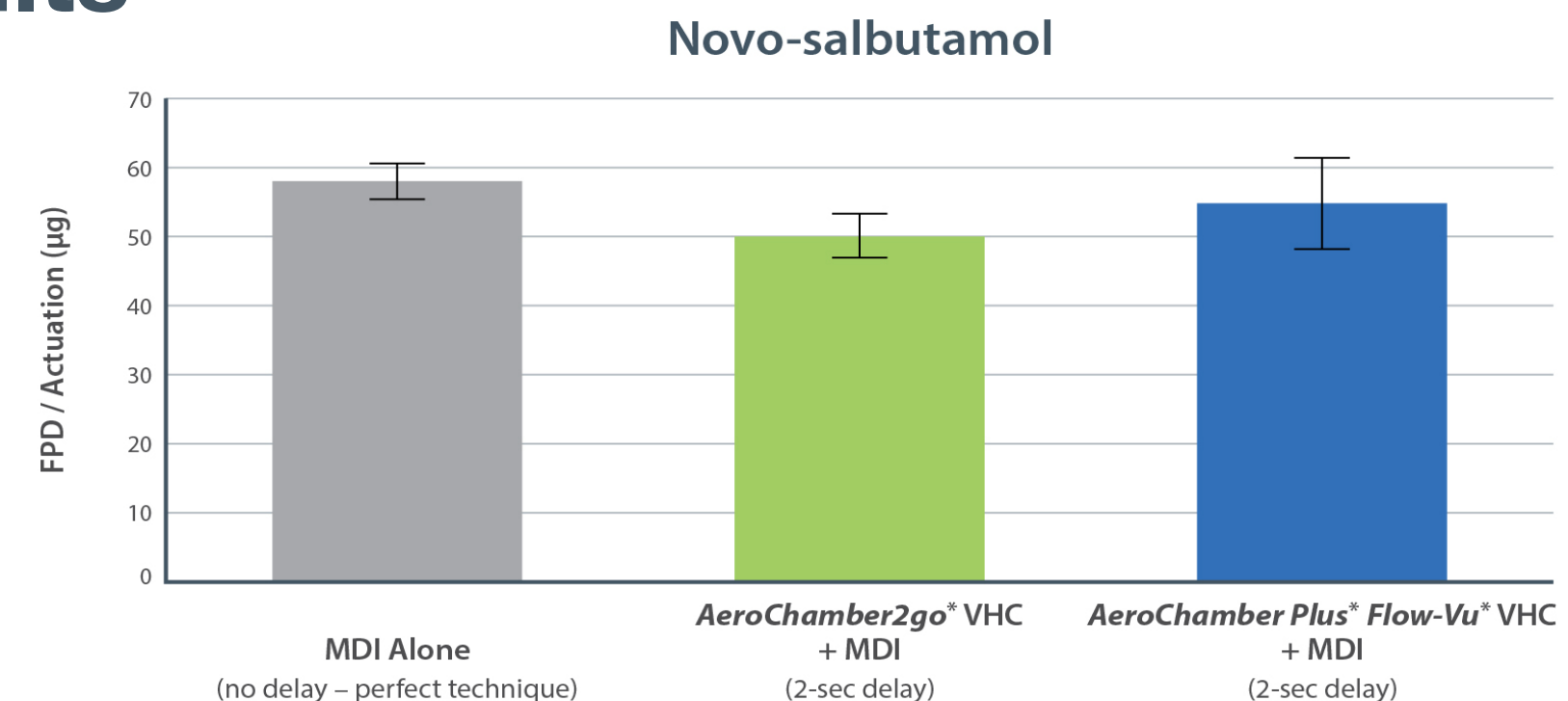


**AeroChamber2go**<sup>\*</sup> VHC used in combination with pMDI

## Methods

- Measurements for fine particle dose (FPD,  $\mu\text{g} < 4.7 \mu\text{m}$ ) were made with a common salbutamol pMDI formulation (Novo-Salbutamol HFA) by cascade impactor at 28.3L/min.
- Two sampling conditions were evaluated: (1) immediate collection simulating no delay between actuation and inhalation; (2) collection after a 2-second delay when using the VHCs ( $n=5$ ) which simulates an uncoordinated use scenario.

## Results



- Values of FPD/actuation from the pMDI with no delay was found to be  $58.0 \pm 2.6 \mu\text{g}$ .
- Following a 2s delay FPD/actuation from the AC2GO and AC+FV VHCs were found to be  $50.0 \pm 3.3 \mu\text{g}$  and  $54.8 \pm 6.6 \mu\text{g}$  respectively.
- Perfect coordination when using the MDI alone is very unusual. Previous studies have shown that even a short delay before inhaling will decrease the drug delivery to the lungs significantly when MDI used alone.

## Conclusions

- Either the established **AeroChamber Plus**<sup>\*</sup> **Flow-Vu**<sup>\*</sup> or new **AeroChamber2go**<sup>\*</sup> VHCs provide the opportunity to deliver similar amounts of salbutamol to the lungs, as with pMDI alone when coordinated perfectly.
- The VHCs also provide the additional benefit of reduced oropharyngeal deposition.

