Reducing Potential Carbon Footprint by Maximizing the Benefits of the Inhaler

Nagel M, Suggett J
Trudell Medical International, London, Ontario, Canada

OBJECTIVE

To compare modelled lung delivery of rescue medication via different valved spacers with facemask with the goal of providing optimum patient care while minimizing potential carbon footprint.

METHODS

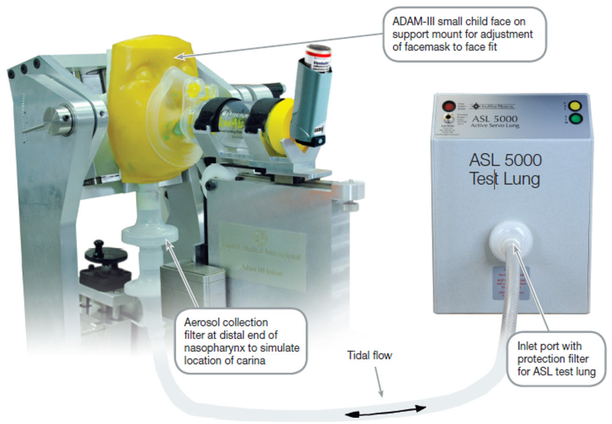
Four different spacer types were evaluated by breathing simulator (tidal volume=155-mL, I:E ratio=1:2, rate=25 cycles/min).

The facemask of each spacer (n=3) was attached to an anatomical model 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 salbutamol (Ventolin† Evohaler) 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/spacer.

This potential delivery was then equated to a potential relative carbon footprint based upon published claims[1] that Ventolin has a carbon footprint of 28 kg CO2 per inhaler.



AeroChamber Plus **Flow-Vu**** VHC
(Trudell Medical International)

OptiChamber Diamond† VHC
(Philips)

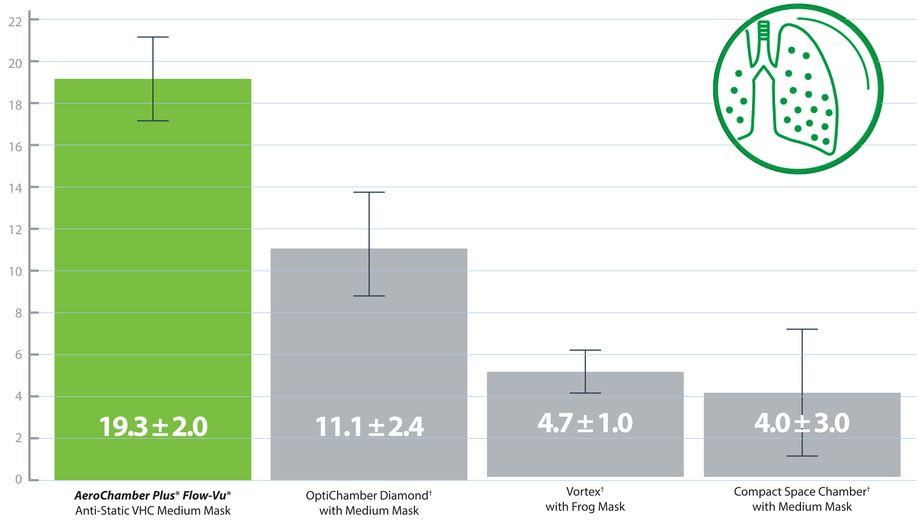
Vortex† VHC
(Pari)

Compact Space Chamber† VHC
(Medical Development International)

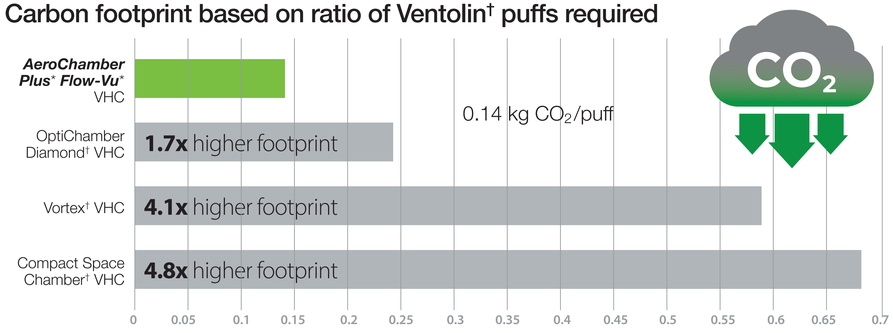
RESULTS

The mass (µg) of salbutamol delivered to modelled carina.

Delivery to Carina (µg/puff)



Carbon footprint based on ratio of Ventolin† puffs required



CONCLUSIONS

Medication delivery can vary significantly depending on the pMDI/spacer system which will have implications on the carbon footprint.

In this case, the use of the ***AeroChamber Plus*** **Flow-Vu**** spacer could potentially reduce the carbon footprint by up to five-fold compared to other spacers.

By maximizing the amount of each puff reaching the lungs the patient is likely to be able to achieve relief sooner.

This will reduce the number of puffs needed and as a result reduce the carbon footprint of the inhaler.

Make every puff count.

Use of the ***AeroChamber Plus*** **Flow-Vu**** VHC has the potential to **reduce the carbon footprint by up to 5 fold** compared to the other spacers evaluated.

TRUDELL MEDICAL INTERNATIONAL

monaghan

[1] https://greeninhaler.org/

American Thoracic Society Conference
May 19 - 24, 2023