Maximizing the benefit from the inhaler in order to minimize carbon footprint.

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OBJECTIVE

To compare the modelled lung delivery of rescue medication via different Valved Holding Chambers (VHC) with the goal of providing optimum patient care and minimizing potential carbon footprint.

METHOD

4 different spacers types were evaluated



AeroChamber Plus* Flow-Vu*
VHC with child facemask
Trudell Medical International



Space Chamber[†] Plus with child mask Medical Development International



Volumatic[†] VHC with infant mask GlaxoSmithKline Inc.



Able Spacer[†] 2 VHC with child mask Clement Clarke

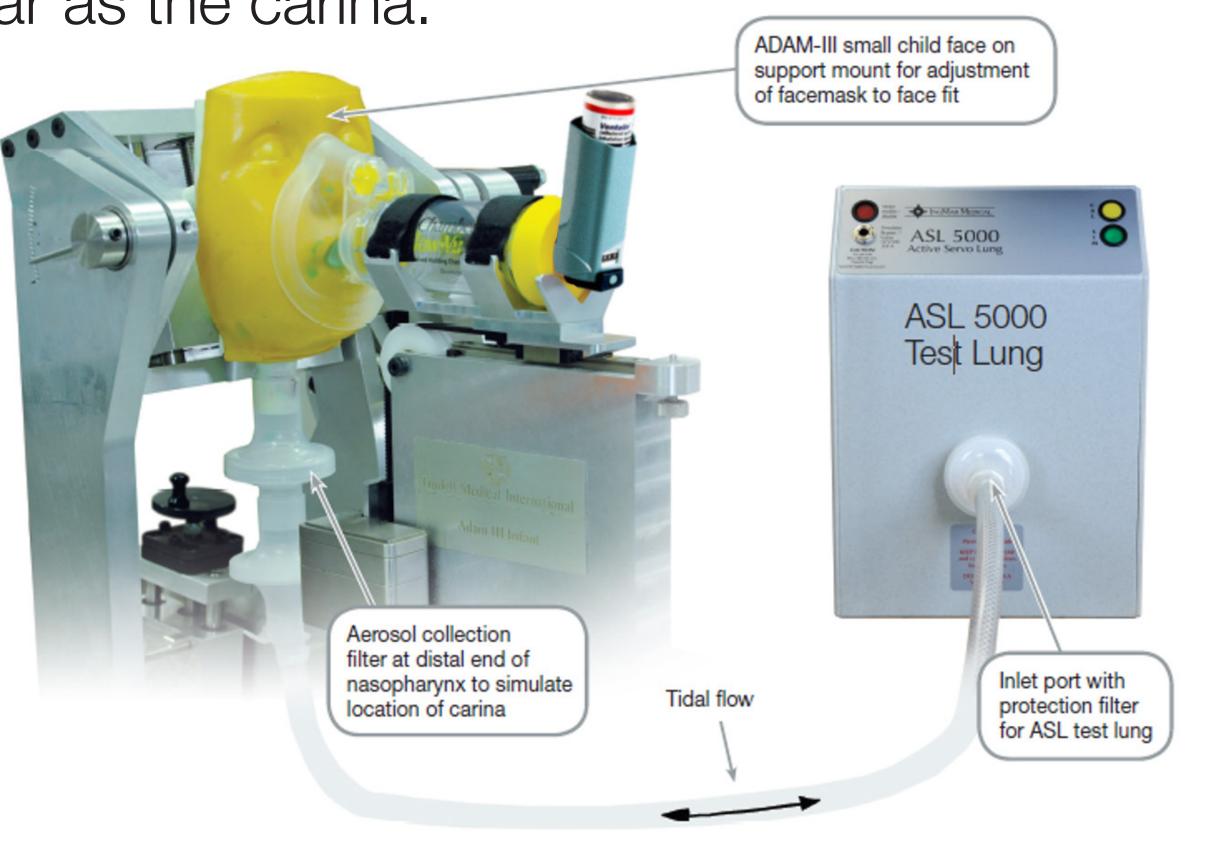
Breathing Simulator evaluation; Tidal volume=155-mL, I:E ratio=1:2, rate=25 cycles/min.

The facemask of each VHC (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.

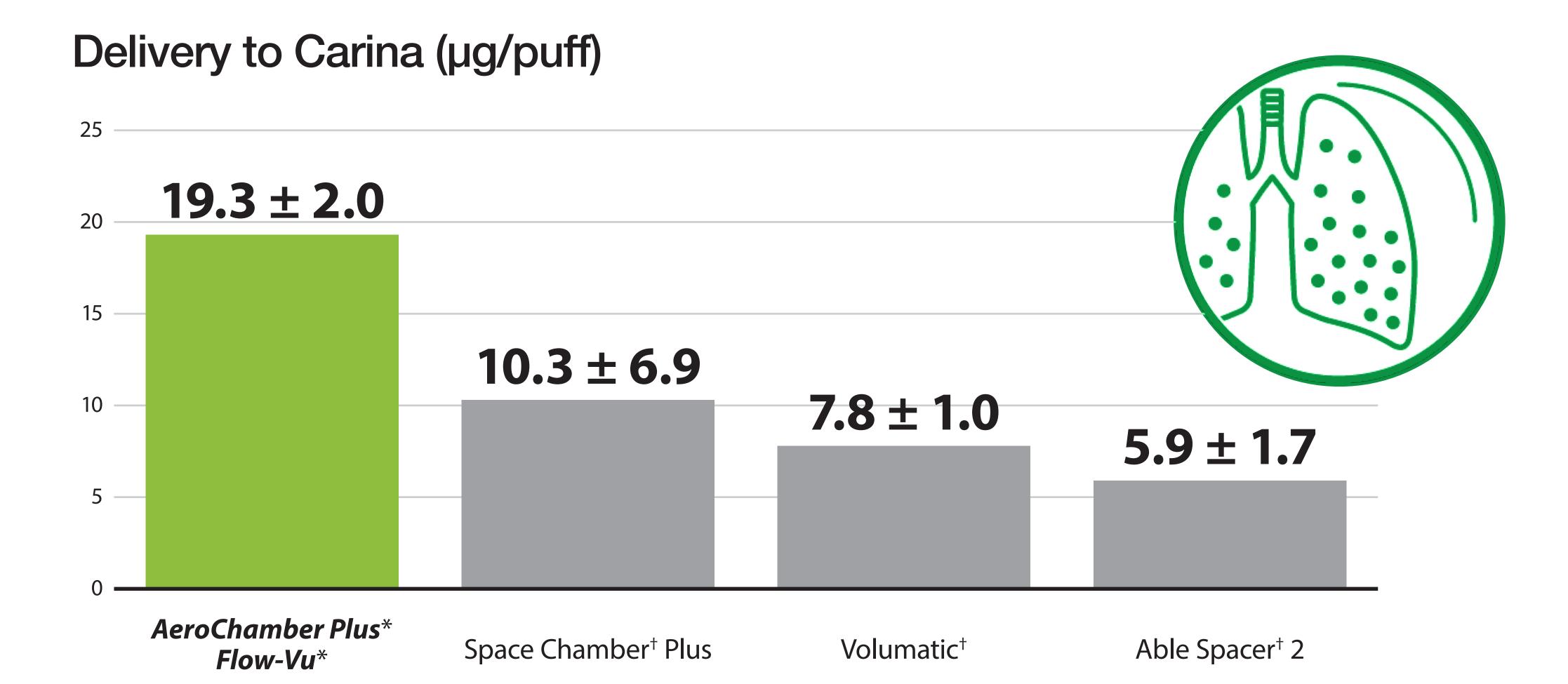
5-actuations of salbutamol (Ventolin[†]) were delivered at 30-s intervals and recovered from specific locations in the aerosol pathway by HPLC.

Comparisons were then made on drug delivery data looking at potential dose to the lungs for each pMDI/spacer.

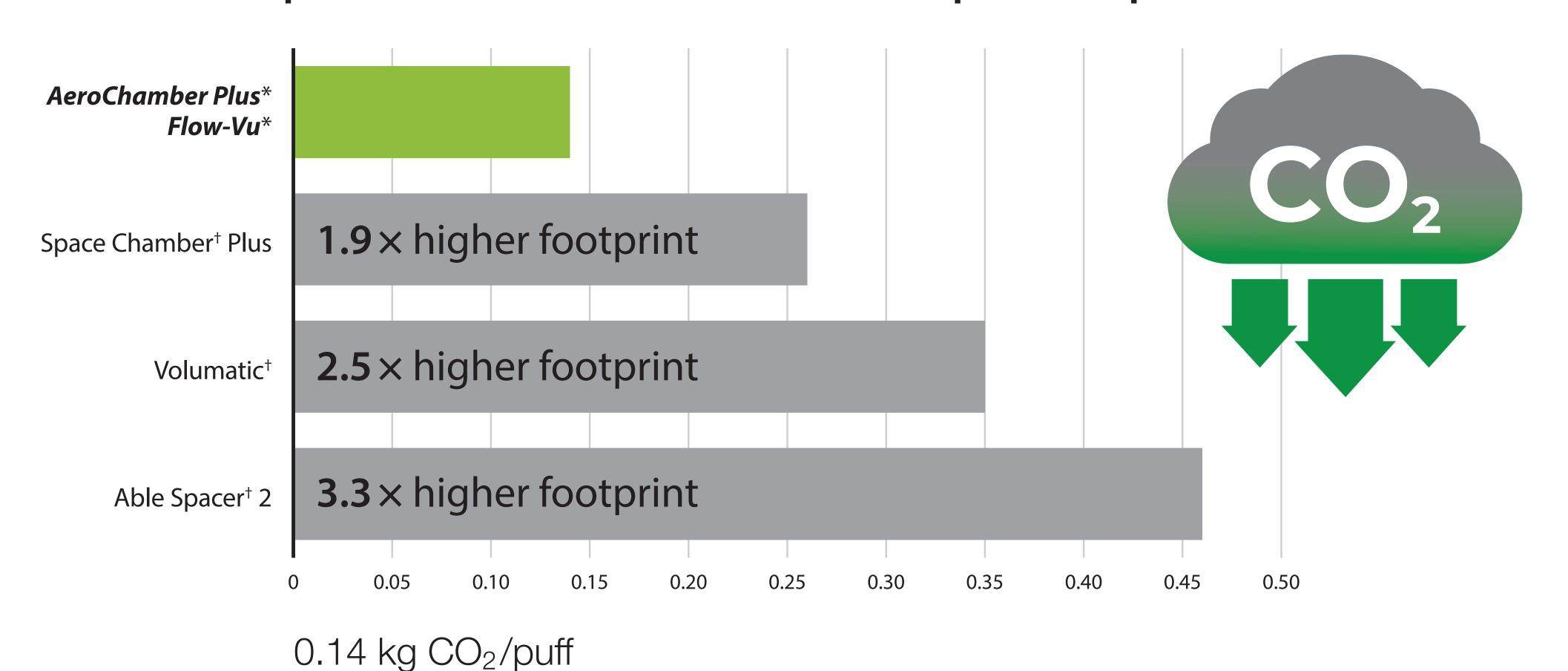
This potential delivery was then equated to a potential relative carbon footprint based upon published claims¹ that Ventolin[†] has a carbon footprint of 28 kg CO₂ per inhaler.



RESULTS



Carbon footprint based on ratio of Ventolin[†] puffs required



CONCLUSION

Depending on the pMDI/spacer system chosen the delivery of medication can vary significantly and as a result will have implications on the potential carbon footprint.

In this case, the use of the *AeroChamber Plus* Flow-Vu** VHC could potentially reduce the carbon footprint by three fold compared to the alternative spacers.

By maximizing the amount of each puff reaching the lungs the patient is likely to be able to get relief sooner and reduce the amount of puffs needed.

