How to Reduce Carbon Footprint by Maximizing the Benefit from the Inhaler

RATIONALE

The carbon footprint related to inhaler use has been identified as a potential concern.

This laboratory study sought to demonstrate that improved patient care could be achieved while minimizing the potential inhaler carbon footprint by comparing modelled lung delivery of inhaled corticosteroid (ICS) medications via a valved spacer.

METHODS

Two different ICS MDIs were investigated, Flovent[†] 125 HFA (Fluticasone Propionate, GSK) and Alvesco⁺ 100 (Ciclesonide, Covis Pharma), both available in the Canadian market.

MDIs were tested alone and combined with an **AeroChamber Plus* Flow-Vu*** Spacer.

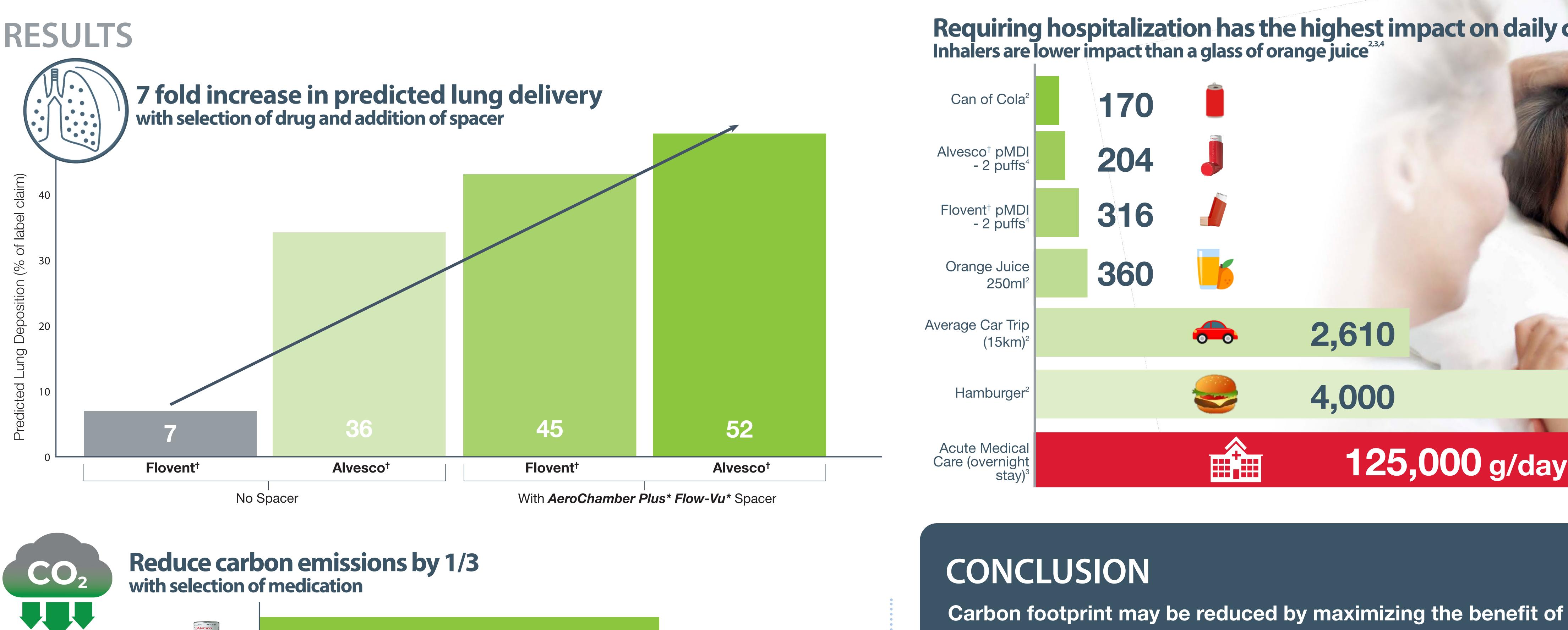
The pMDI+Spacer was evaluated by anatomical model and the airway coupled to a breathing simulator (tidal volume=770mL, I:E ratio = 1:2, rate=12BPM) via a filter to capture drug particles that penetrated as far as the carina.

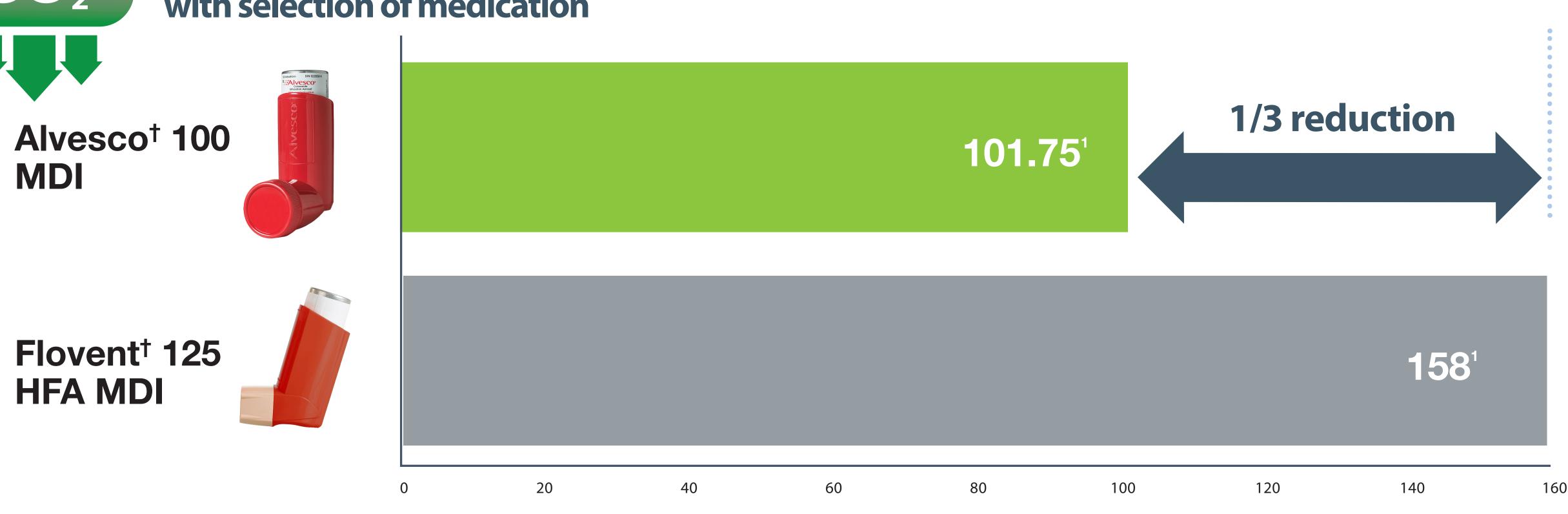
Drug mass that could reach this point was assumed to be available to the lung. Mass of ICS was determined by HPLC assay then equated to a relative carbon footprint based upon published claims.¹





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1 https://www.prescqipp.info/ 2 United Nations. Montreal protocol on substances that deplete the ozone layer. 2018 report of the medical and chemical technical options Committee (MCTOC), 2018. Available: https://ozone.unep.org/sites/default/files/2019-04/MCTOC-Assessment-Report-2018. pdf [Accessed 21 Nov 2019].
3 Tennison et al. Health care's response to climate change: a carbon footprint assessment of the NHS in England. Lancet Planet Health 2021; 5: e84–92. 4 PrescQIPP Inhaler Carbon Footprint Data. Oct 2021.

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the inhaler through drug selection and the addition of a chamber.

Use of the **AeroChamber Plus*** **Flow-Vu*** chamber along with a lower carbon emitting ICS MDI has the potential to improve lung delivery and reduce carbon emissions.

The improved lung delivery should provide the patient with better asthma control, in turn resulting in a reduced need for reliever medications, and consequently an additional environmental benefit.

Requiring hospitalization has the highest impact on daily carbon footprint (g CO₂e)

2,610

4,000

125,000 g/day



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