

# Aerosol treatments for childhood asthma in the era of COVID-19

To the Editor,

About 10% of children in the United States have asthma and aerosols are the cornerstone of treatment of asthma. Nebulizers (wet or jet) are one of the commonly used aerosol-generating medical devices and generate small particles that can spread to a larger distance than a normal breath.<sup>1,2</sup> Anecdotally, we are seeing overuse of aerosol medications in COVID-19 symptomatic patients. The cough caused by COVID-19 does not appear to respond to asthma medications, and patients with asthma do not appear to be at greater risk for serious COVID-19. Nevertheless, treating children with asthma using nebulizers during the COVID-19 pandemic may expose patients and caregivers to cross-infection. Preliminary reports suggest that the median half-life of COVID-19 in aerosols is approximately 1.1 hours.<sup>3</sup> The particles can also stimulate the patient's or any by-stander's cough mechanisms, which increase the risk of disease spread. This risk is linked not only to patients in medical facilities (offices, emergency departments, etc) who proved infected but to any patient with respiratory symptoms regardless of their infectious status.

A pressurized Metered Dose Inhaler (pMDI) is another common method to generate aerosol, yet it has been associated with poor operating technique such as incoordination of activation of the pMDI with commencement of inhalation. To overcome this problem, an additional reservoir (commonly called "spacer") is placed between the mouthpiece of the pMDI and the mouth of the patients (or a mask in infants and young children). Newer spacers have been equipped with a one-way valve permitting airflow into, but not out of the patient's mouth and are named Valved-Holding Chambers (VHCs). The efficacy of MDIs with spacers/VHCs is comparable to nebulization.<sup>4</sup> In addition, delivery time is shorter, dosage is smaller and side effects are minimized with MDIs.<sup>4</sup>


Although in many countries nebulizers have been replaced by MDIs for the treatment of asthmatic patients, this was not a global practice. In the era of COVID-19, many agencies (eg, WHO, The American College of Chest Physicians, GINA, The Canadian Paediatric Society) are now in agreement that where possible, limiting aerosolized medications via nebulizers is a sensible recommendation to mitigate infection risk.<sup>5,6</sup> The pediatric community should strongly advocate the use of MDI/VHC for asthma treatment as well as for other diseases requiring inhaled medications. This practice should be implemented in emergency departments, hospital wards, and community offices. Nebulization should be restricted to one of

the following: severe asthma, status asthmaticus, or other life-threatening situation, children who cannot be treated with MDI/VHC or children who, for any reason, do not respond to MDI treatment.

MDI treatment should always be administered through a VHC. Children older than 4 to 5 years can use a VHC with mouthpiece while younger children should be prescribed a VHC with a mask.

MDI should not be transferred from patient to patient. Multi-patient use is a practice in certain centers when strict infection control measures are being taken. Ideally, a VHC should be personal for each patient, however, certain VHCs can be autoclaved and transferred from patient to patient.

In conclusion, given that MDI/VHC has been shown to be as effective in numerous clinical situations, switching from nebulization to MDI/VHC treatment should be another important step that pediatricians can take in reducing COVID-19 spread, particularly among health caregivers.

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