

# RESPIRATORY SPACER DEVICES

## WRHA LONG TERM CARE PROGRAM

A pressurized metered-dose inhaler (MDI) delivers aerosol medication from a canister by using a propellant spray. Medications for COPD and asthma administered via pressurized MDIs include inhaled corticosteroids (e.g. fluticasone), and bronchodilators (e.g. salbutamol). While pressurized MDIs continue to be a mainstay treatment delivery system for asthma and COPD, they tend to spray out medication more quickly than most people can inhale. Co-coordinating inhalation and breath holding with the release of medication from the device can be difficult to do. It has been estimated that only **10-15%** of a dose from a pressurized MDI reaches the lungs, while 80% remains in the oropharynx and is swallowed making the person vulnerable to poor symptom control and exacerbations.

### Disadvantages of using a pressurized MDI in a geriatric population include:

- Shallow or low volume breathing patterns
- Not being able to follow directions due to cognitive limitations
- The individual may stop inhaling once the medication hits the back of their throat, or be unable to hold their breath long enough after inhaling the medication directly from a MDI

### Canadian Thoracic Society – 2010 Consensus Summary

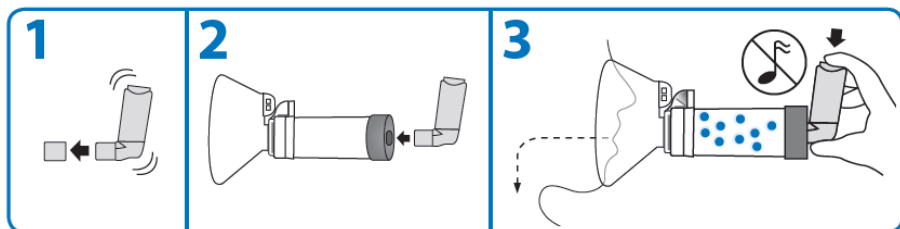
For consistent medication availability and delivery, using a spacer device or holding chamber with a facemask attachment in conjunction with a MDI is recommended for elderly people.

### What is a spacer device and how does it work?

A spacer device, such as the AeroChamber Plus<sup>®</sup> attaches to most pressurized metered dose inhalers (MDIs) and it collects and holds the aerosol medication spray. When the aerosol medication is in the spacer, the propellant has time to evaporate, smaller medication particles separate from the larger ones and travel slower. As the patient inhales, the smaller particles of medication float out of the chamber into the respiratory tract. The spacer holds the remaining small particles that were not inhaled the first time, which allows the patient to take more than one breath for each puff of medicine administered. The AeroChamber Plus<sup>®</sup> is designed with valves that respond to shallow or low volume breathing patterns, which makes it easier for patients to inhale the medication. The valves only permit smaller particles to pass, which reduces the unwanted effect of larger particles being deposited in the mouth and throat.

### Benefits of using a spacer with a pressurized MDI:

- Allows the use of a pressurized MDI during episodes of acute airflow obstruction with dyspnea
- Spacers increase inhaled medication by **2-4 times** than the pressurized MDI alone
- Studies indicate that patients who use a spacer with their MDI had better asthma control than those using only a MDI. Quality of life was improved, the rate of exacerbations was reduced by 10-12%, and the rate of hospitalization was reduced by 19%
- Oropharyngeal deposition with a spacer was reduced from approximately 80% to 20%. This results in less local side effects such as throat irritation, oral candidiasis (thrush), and hoarse voice



### Instructions for Use:

- Remove the cap from the MDI and shake it well immediately before each use
- Insert the MDI into the back piece of the chamber
- Apply the mask to the person's face and ensure there is an effective mask/face seal
- Instruct the person to exhale once and then to slowly inhale
- At the beginning of an inhalation, press down on the top of the metal canister to release 1 puff of medication into the spacer
- Hold the mask in place until the person has taken 5-6 regular tidal breaths (a tidal breath includes a full inhalation and exhalation while at rest). "1 puff" from the inhaler has now been administered to the person
- If more than 1 puff is ordered by the prescriber, wait 15–30 seconds and repeat steps 1-3 to deliver each additional puff
- When complete, replace the cap on the mouthpiece of the MDI
- If giving an inhaled steroid, have the person rinse their mouth with water

### Additional Information:

- Spacers are used only with pressurized MDIs or inhalation aerosols. They are not used with dry powder inhalers (e.g. Symbicort<sup>®</sup> Turbuhaler<sup>®</sup>)
- Spacers should be labeled person-specific, but the same spacer can be used for all of the pressurized MDIs prescribed for that person
- After use, wipe the outside of the spacer with a disinfectant wipe (avoid the label). Keep device in a sealed Ziplock bag
- Administer 1 puff from the MDI at a time into the spacer (each "puff" requires 5-6 tidal breaths to obtain the dose from the spacer device)
- The person does not need to hold their breath with each inhalation, and they can exhale and inhale normally while the mask is in place
- Instruct the person to slow down their inhalations if you hear a whistle sound
- If medication build-up (white film) appears in the chamber, wash with mild dish soap and warm water. Allow it to air dry in the vertical position before next use.
- Spacer devices are to be replaced after 12 months of use



Video: *How to use a Metered Dose Inhaler / puffer with spacer and mask* <https://youtu.be/54S1zXDLEEI>

### References:

- 1) Trudell Medical International Instructions for Use [https://www.trudellmed.com/sites/default/files/inline-files/ACFV\\_mask\\_EN\\_0.pdf](https://www.trudellmed.com/sites/default/files/inline-files/ACFV_mask_EN_0.pdf)
- 2) MD Loughheed, C Lemièrre, SD Dell, et al. *Canadian Thoracic Society Asthma Management Continuum – 2010 Consensus Summary for children six years of age and over, and adults.* Can Respir J 2010;17(1):15-24.
- 3) Vincken W, Levy ML, Scullion J, et al. *Spacer devices for inhaled therapy: why use them, and how?* ERJ Open Res 2018; 4: 00065-2018 [https://doi.org/10.1183/23120541.00065-2018]
- 4) American Thoracic Society. *Using Your Metered Dose Inhaler.* Am J Respir Crit Care Med, Vol. 190, P5-P6, 2014.
- 5) Momeni S, Nokhodchi A, Ghanbarzadeh S, et al. *The effect of spacer morphology on the aerosolization performance of metered-dose inhalers.* Adv Pharm Bull 2016; 6(2):257-260.
- 6) Dissanayake, S., & Suggett, J. (2018). *A review of the in vitro and in vivo valved holding chamber (VHC) literature with a focus on the AeroChamber Plus Flow-Vu Anti-static VHC.* Therapeutic Advances in Respiratory Disease. <https://journals.sagepub.com/doi/pdf/10.1177/1753465817751346>
- 7) Burudpakdee, C., Kushnarev, V., Coppolo, D. et al. *A Retrospective Study of the Effectiveness of the AeroChamber Plus<sup>®</sup> Flow-Vu<sup>®</sup> Antistatic Valved Holding Chamber for Asthma Control.* Pulm Ther 3, 283–296 (2017) [doi:10.1007/s41030-017-0047-1](https://doi.org/10.1007/s41030-017-0047-1)