

Metered-Dose Inhaler Fact Sheet

Metered-dose inhaler (MDI) is a pressurized canister, which is placed into an actuator attached to a mouthpiece. It delivers a pressurized aerosol mist consisting of a prescribed medication and a hydrofluoroalkane (HFA) propellant. The utilization of the MDI with a valved holding chamber/spacer is the preferred method for the delivery of MDI medications.

Indications

- Delivery of inhaled respiratory medications to patients who are able to take deep breaths on their own
- Commonly used to administer bronchodilators; quick relief medications (albuterol); steroids; and anticholinergics to patients in need of the prescribed medication

Side Effects

- The use of anticholinergic drugs can be associated with the increase of ocular pressure and should be monitored for patients with glaucoma
- The development of oral yeast infection (thrush) can occur with the use of steroid from the plume impacting oropharyngeal during disposition

Cleaning Instructions

- Follow manufacturer's directions for each device

If none are provided, general cleaning instructions include:

- For cleaning: remove the canister from the actuator (plastic sleeve) and mouthpiece cap. Rinse the actuator and mouthpiece with warm water for 30 seconds once a week.
- For drying: shake off excess water and let the mouthpiece air dry. When the mouthpiece is thoroughly dry reinsert the canister back into the mouthpiece for use.
- If inhaler use is required before drying is completed, shake off excess water and insert canister into actuator and spray several times to ensure a mist is forming before use.

References

1. Wilkins R.L. & Stoller J. K, & Kacmarek R.M. (2009). Aerosol Drug Therapy. In J. Fink (Eds.), Egan's Fundamentals of Respiratory Care, 9th edition (pp 801-842). St. Louis, Missouri: Mosby Elsevier.
2. American Lung Association." *How to use a Metered-Dose Inhaler*". Feb 07, 2012 Retrieved from www.lung.org.
3. Interactive Guidance & Management. "Purpose of Cleaning Inhaler".2013. Retrieved from www.use-inhaler.com.



MDI WITHOUT HOLDING CHAMBER/SPACER INHALATION TECHNIQUE CHECKLIST

***Trained assessor to read to participant: Please show me exactly* how you use your MDI (without spacer) at home
 *If using actual medicine (not placebo) the patient should mimic use (i.e. do not take repeated doses)***

	Pre		Post 1		Post 2		Post 3	
	Wrong	Correct	Wrong	Correct	Wrong	Correct	Wrong	Correct
1. Removes caps of inhaler	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
2. Shakes inhaler up and down	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
3. Breathes out fully	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
4. When breathing out fully, does so away from MDI	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
5. Puts MDI mouthpiece into mouth, closes lips around mouthpiece	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
6. Presses down on canister one time	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
7. Breathes in SLOWLY, filling lungs with medicine	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
8. Holds breath for at least 10 seconds (with or without inhaler in mouth)	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
9. Removes spacer from mouth before breathing normally	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
10. Breathes normally for at least 30-60 seconds	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
11. Repeats steps 2-10 for second puff	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
12. Rinse mouth (if using a steroid medication)	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
Participant's Score:	___/12		___/12		___/12		___/12	
	[] N/A		[] N/A		[] N/A		[] N/A	

Score the participant's performance by assigning 1 point to each correct step and adding across the 12 steps. If score is less than 12, demonstrate to the participant appropriate technique and repeat inhaler assessment.

Comments: _____

Valved Holding Chamber/Spacer **Fact Sheet**

A valved holding chamber, often referred to as a spacer, is a device which allows for easier delivery of metered-dose inhaler (MDI) medication. It is added between the patient's mouth and the MDI. It decreases the impact of the aerosol on the patient's oropharynx and allows for deeper penetration of the medication to the lower airways. Valved holding chambers have a one way valve which holds the medication for a short period of time until the patient is ready to breathe it in. A spacer does not have a valve but does put space between the patient and the medication, reducing medication side-effects.

Indications

- To maximize the delivery of medication from a MDI
- Patients with poor coordination that are unable to perform the required hand-breath coordination with MDIs
- To reduce medication side effects such as oropharyngeal deposition

Advantages

- It is easy to use
- Improves medication deposition
- Can be used with a face mask

Disadvantages

- The spacer will require some hand-breath coordination
- Not all MDIs fit in all spacers. It is important to make sure the medication and device are compatible

Cleaning Instructions

- Follow manufacturer's directions

If none are provided, general cleaning instructions include:

- Wash the spacer with liquid dishwashing soap
- Do not rinse
- Allow device to drip dry
- The use of cloths or paper towels may increase static electricity reducing the amount of delivered medication.

References

1. Wilkins R.L. & Stoller J. K, & Kacmarek R.M. (2009). Aerosol Drug Therapy. In J. Fink (Eds.), Egan's Fundamentals of Respiratory Care, 9th edition (pp 801-842). St. Louis, Missouri: Mosby Elsevier.
2. Global Initiative for Asthma. How to Use a Metered Dose Inhaler [PDF document]. 2011; Retrieved from www.ginasthma.org/local/uploads/content/files/inhaler_charts_2011.pdf.



Patient Name: _____
 Patient ID: _____
 Evaluator Initials: _____
 Date: ___/___/___

MDI WITH HOLDING CHAMBER/SPACER INHALATION TECHNIQUE CHECKLIST

Trained assessor to read to participant: Please show me exactly* how you use your MDI/Spacer at home
****If using actual medicine (not placebo) the patient should mimic use (i.e. do not take repeated doses)***

	Pre		Post 1		Post 2		Post 3	
	Wrong	Correct	Wrong	Correct	Wrong	Correct	Wrong	Correct
1. Removes caps of inhaler and spacer	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
2. Shakes inhaler up and down	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
3. Attaches inhaler to spacer	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
4. Breathes out fully	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
5. Breathes out away from spacer/MDI	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
6. Closes lips around spacer mouthpiece	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
7. Presses down on canister one time	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
8. Breathes in SLOWLY (no whistle sound)	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
9. Holds breath for at least 10 seconds (with or without spacer in mouth)	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
10. Removes spacer from mouth before breathing normally	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
11. Breathes normally for at least 30-60 seconds	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
12. Repeats steps 2-11 for second puff	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
13. Rinses mouth (if using a steroid medication)	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁	<input type="checkbox"/> ₀	<input type="checkbox"/> ₁
Participant's Score:	___/13		___/13		___/13		___/13	
	[] N/A		[] N/A		[] N/A		[] N/A	

Score the participant's performance by assigning 1 point to each correct step and adding across the 13 steps. If score is less than 13, demonstrate to the participant appropriate technique and repeat inhaler assessment.

Comments: _____

