

Inhalers - Inservice Presentation

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A dark blue diagonal graphic that starts from the bottom left corner and extends towards the top right corner, covering the lower half of the slide.

Objectives

1. Identify the different types of inhalers used in the management of respiratory conditions.
2. Demonstrate correct inhaler technique for each type of inhaler.
3. Discuss the medications contained in inhalers and their respective mechanisms of action.
4. Recognize common side effects associated with inhaler therapy.
5. Outline strategies for managing and minimizing inhaler-related side effects.
6. Address patient concerns and questions regarding inhaler therapy.

Importance of Adherence & Technique

- Inability to use inhalers correctly is frequently observed
- Correct inhaler use is crucial for effectiveness
- Misuse can hinder disease control and patient perception of effectiveness
- Misuse can also reduce the amount of drug delivery to the lungs and increase side effects
- “An Evaluation of the Use of Inhalers in Asthma and Chronic Obstructive Pulmonary Disease”
 - Out of 300 patients, 70.2% were using their inhalers incorrectly
 - The rate of misuse among MDI > DPI (77.6% vs 64%)
 - The most common mistake encountered was forgetting to breath out before inhalation

Medications

Short-Acting Beta-2 Agonists (SABA):	Long-Acting Beta-2 Agonists (LABA):	Long-Acting Muscarinic Antagonists (LAMA):	Inhaled Corticosteroids (ICS):
albuterol	formoterol*	tiotropium	beclomethasone
levalbuterol	salmeterol	umeclidinium	budesonide
	vilanterol		ciclesonide
			fluticasone
			mometasone

Inhaler Names

Generic Name	Brand Name
albuterol	ProAir, Ventolin, Proventil
levalbuterol	Xopenex
tiotropium	Spiriva Respimat
beclomethasone	QVAR Redihaler
budesonide	Pulmicort
budesonide/formoterol	Symbicort
fluticasone	Flovent Diskus & Flovent HFA
fluticasone/salmeterol	Advair Diskus & Advair HFA
fluticasone/vilanterol	Breo Ellipta
mometasone	Asmanex
mometasone/formoterol	Dulera
umeclidinium/vilanterol/fluticasone	Trelegy Ellipta
ciclesonide	Alvesco

Rescue vs. Maintenance

Characteristic	Relievers (Rescue) Inhalers	Controllers (Maintenance) Inhalers
Purpose	Provide quick relief during asthma exacerbations	Used regularly to control asthma symptoms and prevent exacerbations
Medication Type	Short-acting beta agonists (SABA) such as albuterol	Long-acting beta agonists (LABA), inhaled corticosteroid (ICS), combination LABA/ICS
Onset of Action	Rapid onset, typically within minutes	Slower onset, may take days to weeks
Administration	Used as needed during symptoms	Taken regularly, typically once or twice a day
Symptom Relief	Provides immediate relief of acute symptoms such as wheezing and shortness of breath	Helps prevent symptoms and exacerbations by reducing airway inflammation and bronchospasm

Differences & Similarities in Inhalers

Metered Dose Inhaler (MDI)	Dry Powder Inhaler (DPI)	Soft Mist Inhaler (SMI)
HFA, Respimat, or no suffix	Diskus, Ellipta, or RespiClick	HFA, Respimat
Aerosolized liquid	Fine powder	Aerosolized liquid
Propellant	NO propellant	NO propellant
Slow, deep inhalation	Quick, forceful inhalation	Slow, deep inhalation
Can use spacer	CANNOT use spacer	CANNOT use spacer
MUST shake before use*	DO NOT shake before use	DO NOT shake before use
May need to prime	Priming NOT needed**	May need to prime

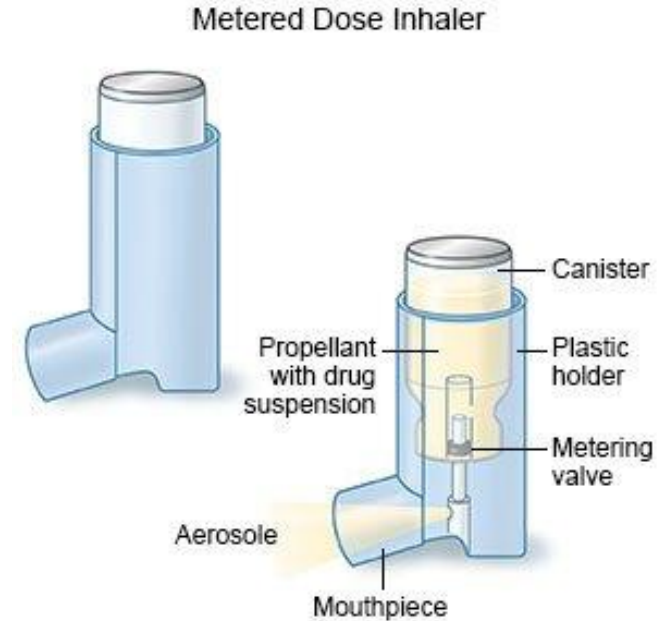
*EXCEPT QVAR RediHaler and Respimat

**EXCEPT Flexhaler

Instructions For Use

Metered Dose Inhaler (MDI)

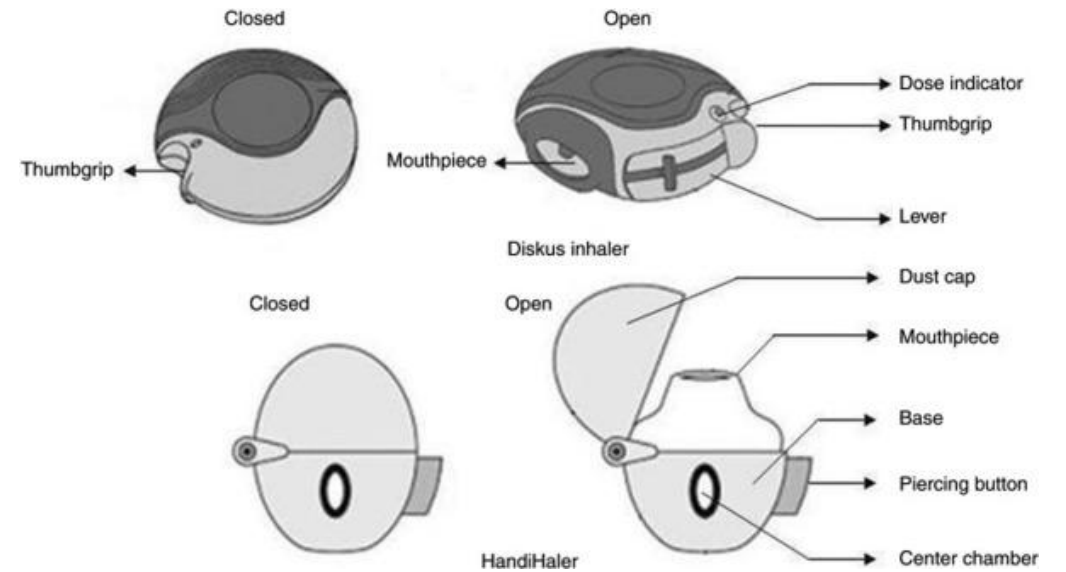
1. Insert the canister into the actuator.
2. Shake the inhaler for 5 seconds (before each spray).
3. Remove the cap and prime (if needed)**
4. Breathe out fully from your mouth, expelling as much air as possible.
5. Place the mouthpiece into your mouth and make a seal with your lips.
6. Press down the canister while breathing in **slowly** and **deeply** at the same time.
7. After inhaling all the way, remove the inhaler and hold your breath for 10 seconds while keeping mouth closed then breath normally.
8. If another inhalation is needed, wait 1 minute and repeat.
9. Replace cap when finished



Instructions For Use

Dry Powder Inhaler (DPI)

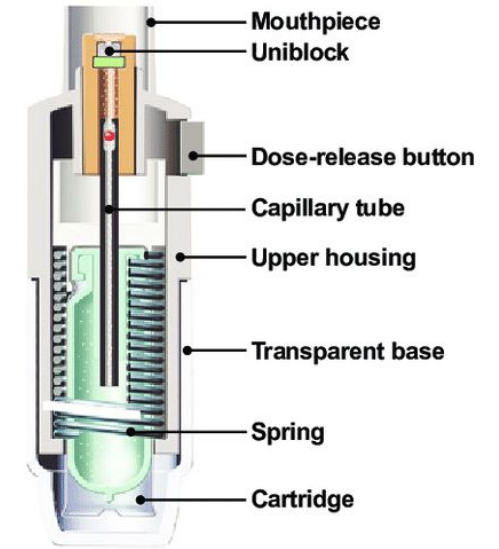
1. Actuate in inhaler (varies by DPI).
2. Hold the inhaler level.
3. Breath out fully from your mouth, expelling as much air as possible while facing away from the inhaler.
4. Place the mouthpiece into your mouth and make a seal with your lips.
5. Breath in quickly and forcefully through your mouth.
6. Remove the inhaler and hold your breath for 10 seconds while keeping your mouth closed.
7. Close the inhaler.



Instructions For Use

Soft Mist Inhaler (SMI)

1. Turn the clear base of the SMI until you hear a click.
2. Open the cap until it clicks.
3. Hold the SMI in one hand with your pointer finger over the dose-release button. Turn your head away from the SMI and breathe out slowly.
4. Close your lips around the mouthpiece. Press the dose release button and breathe in slowly and deeply.
5. Hold your breath for 10 seconds.
6. After holding your breath, breathe out slowly.
7. Replace the cap and turn the clear base again for another dose if needed.
8. Clean the mouthpiece with a damp cloth or tissue once a week.
9. Store the inhaler in a cool, dry place away from direct sunlight.



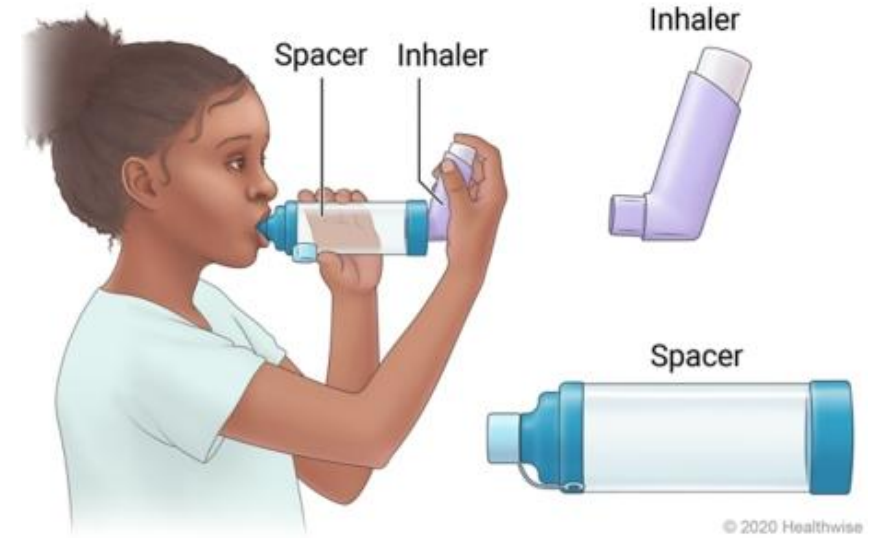
Spacers

Overview

- A spacer, also known as a holding chamber, enhances medication delivery with MDIs to the lungs
- Spacers improve MDI use by coordinating inhalation and reducing medication waste in the mouth and throat, enhancing lung delivery
- A spacer includes a plastic tube with a mouthpiece and an MDI insertion point. Some spacers have a one-way valve to aid inhalation coordination

Benefits

1. Improves medication delivery to the lungs
2. Reduces the risk of side effects like oral thrush and hoarseness
3. Makes inhaler use easier, especially for children and those with coordination difficulties
4. Reduces the need for hand-breath coordination, making it easier for patients to use correctly



Cleaning

Metered-Dose Inhalers (MDIs):

1. Remove the canister from the plastic casing.
2. Rinse the plastic casing and cap with warm water.
3. Shake off excess water and let the parts air dry completely.
4. Do not rinse the canister or put it in water.
5. Clean the mouthpiece weekly with a dry tissue or cloth.
6. Avoid using soap or detergent as it may leave a residue.

Dry Powder Inhalers (DPIs):

1. DPIs typically do not require cleaning as they do not contain propellants.
2. Wipe the mouthpiece with a dry tissue or cloth if necessary.
3. Avoid using water or other liquids to clean DPIs as it may damage the device.



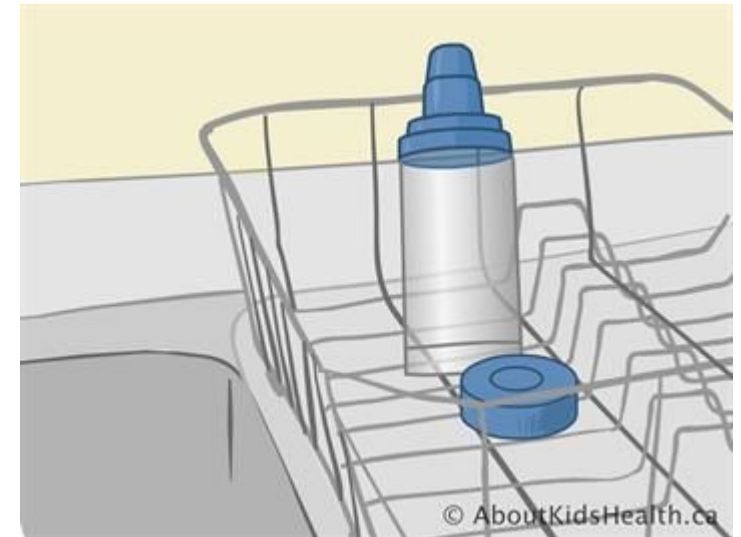
Cleaning

Soft Mist Inhalers (SMIs):

1. Remove the medication cartridge from the inhaler.
2. Rinse the mouthpiece and outer casing with warm water.
3. Shake off excess water and allow the parts to air dry completely.
4. Do not rinse the medication cartridge or submerge it in water.
5. Clean the mouthpiece and outer casing weekly to prevent buildup.
6. Avoid using soap or detergent as it may leave a residue.

Spacer Devices (Used with MDIs):

1. Remove the mouthpiece from the spacer device.
2. Rinse the spacer device and mouthpiece with warm water.
3. Shake off excess water and allow the parts to air dry completely.
4. Do not rinse the spacer device with soap or detergent.
5. Clean the spacer device after each use to prevent bacterial growth and buildup.



Side Effects

Side Effects	ICS
Common Side Effects	<ul style="list-style-type: none">● Thrush (oral yeast infection)● Hoarseness● Cough● Sore throat● Easy bruising● Increased risk of osteoporosis● Cataracts
Serious Side Effects	<ul style="list-style-type: none">● Adrenal suppression● Growth suppression (in children)● Increased risk of glaucoma● Psychiatric effects (anxiety, depression)● Increased risk of pneumonia● Adrenal crisis (rare but potentially life-threatening)

Side Effects

Side Effects	SABAs and LABAs
Common Side Effects	<ul style="list-style-type: none">● Tremors● Tachycardia● Palpitations● Headache● Nervousness● Dizziness● Insomnia● Muscle cramps
Serious Side Effects	<ul style="list-style-type: none">● Hypokalemia● Hypertension● Worsening of diabetes● Increased risk of cardiac arrhythmias● Increased risk of atrial fibrillation● Increased risk of myocardial ischemia● Increased risk of QT prolongation

Side Effects

Side Effects	LAMAs
Common Side Effects	<ul style="list-style-type: none">● Dry mouth● Constipation● Urinary retention● Blurred vision● Glaucoma exacerbation● Tachycardia● Palpitations● Allergic reactions (rash, itching, swelling)
Serious Side Effects	<ul style="list-style-type: none">● Paradoxical bronchospasm● Gastrointestinal effects (nausea, vomiting)● Musculoskeletal effects (joint pain, back pain)● Cystitis (inflammation of the bladder)

Managing Side Effects

Thrush from ICS use:

- To manage thrush, patients can rinse their mouth with water or a mouthwash after using the inhaler to reduce the risk of fungal overgrowth.
- Healthcare providers may also prescribe antifungal medications, such as nystatin oral suspension or fluconazole tablets, for severe or persistent cases of thrush.

Hoarseness from ICS use:

- Patients can try using a spacer device with their inhaler to reduce the amount of medication deposited in the throat, which may help minimize hoarseness.
- Drinking plenty of fluids and using throat lozenges or throat sprays may also help soothe hoarseness caused by these inhalers.

Quiz Session

1. Match the following drug with their drug class

- | | |
|---------------|---|
| a. tiotropium | SABA (Short Acting Beta Agonist) |
| b. salmeterol | ICS (Inhaled corticosteroids) |
| c. budesonide | LAMA (Long Acting Muscarinic Antagonists) |
| d. albuterol | LABA (Long Acting Beta Agonists) |

Quiz Session

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| c. budesonide | LAMA (Long Acting Muscarinic Antagonists) |
| d. albuterol | LABA (Long Acting Beta Agonists) |
-

Quiz Session

2. True/False

Spacers can be used with Dry Powder Inhalers for patients that have coordination issues.

Quiz Session

2. True/False

Spacers can be used with Dry Powder Inhalers for patients that have coordination issues.

Quiz Session

3. Oral candidiasis (thrush) is a common adverse effect associated with which of the following?

- a. LAMA
- b. SABA
- c. ICS
- d. LABA

Quiz Session

3. Oral candidiasis (thrush) is a common adverse effect associated with which of the following?

- a. LAMA
- b. SABA
- c. ICS**
- d. LABA

Quiz Session

4. Which of the following inhaler types must the patient shake before each use?

- a. DPI
- b. SMI
- c. MDI

Quiz Session

4. Which of the following inhaler types must the patient shake before each use?

- a. DPI
- b. SMI
- c. **MDI**

Quiz Session

5. True/False

Dry Powder Inhalers can be cleaned by using soap and water.

Quiz Session

5. True/False

Dry Powder Inhalers can be cleaned by using soap and water.

Quiz Session

6. How would you counsel a patient to prevent them from developing thrush?
- a. do not use more than 3 puffs per day
 - b. rinse your mouth with water and spit after use
 - c. hold your breath for 10 seconds after use
 - d. take antibiotics while using inhalers

Quiz Session

6. How would you counsel a patient to prevent them from developing thrush?
- a. do not use more than 3 puffs per day
 - b. rinse your mouth with water and spit after use**
 - c. hold your breath for 10 seconds after use
 - d. take antibiotics while using inhalers




Quiz Session

7. Match the side effect with the corresponding inhaler medication:

- | | |
|-------------------|-----------|
| a. Albuterol | Tremors |
| b. Beclomethasone | Dry Mouth |
| c. Tiotropium | Thrush |

Quiz Session

7. Match the side effect with the corresponding inhaler medication:

- a. Albuterol  Tremors
- b. Beclomethasone  Dry Mouth
- c. Tiotropium  Thrush

References

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Questions?

