USING A METERED DOSE INHALER WITH SPACER FOR MEDICATION DELIVERY

PURPOSE
Procedure to guide clinicians in the safe and effective delivery of medications using a metered dose inhaler (MDI) with a spacer.

POLICY STATEMENTS
Administration of medication in metered dose inhalers requires a prescriber’s order. The order must meet safe prescribing practices as described in Medication Order Requirements Policy.

Health care providers administering any medication are responsible for knowing the classification of drug to be administered, its mode of action and side effects in order to provide safe care.

The “Rights of Medication Administration” are consistently used by all health care providers when administering medications.

SITE APPLICABILITY
Applicable to all clinical areas.

PRACTICE LEVEL/COMPETENCIES
RNs, RPNs and LPNs may administer medications in metered dose inhalers that are within their scope and competencies to administer.

DEFINITIONS
A metered-dose inhaler (MDI) is a small metal canister that sits in a plastic holder. The metal canister contains medication in an aerosol form. When the person pushes on the canister, a specific amount of medication is released.

A spacer acts as a holding chamber for the medication sprayed out of the MDI. It slows down the medicine delivered from the MDI, helping the medication reach the lungs and lessening side effects in the mouth and throat. A spacer should always be prescribed for use with an MDI. A spacer is used with a mask or a mouthpiece.

- **Spacer with mask** is used with infants and with children who are developmentally unable to follow directions or keep the mouthpiece in the mouth. Generally used in children less that 4-5 years of age. As soon as the child is able to use a spacer with mouthpiece, they should be switched over. A spacer with a mouthpiece delivers the medicine more effectively. Medicine can be deposited into the nose when using a spacer with a mask. Using a spacer with a mouthpiece can prevent this from happening.

- **Spacer with mouthpiece** is used with children who are able to follow directions and to keep the mouthpiece in the mouth. Generally for anyone older than 4-5 years of age.
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EQUIPMENT

- MDI as ordered
- Spacer with mouthpiece or mask
  - Mouthpiece for children age 4-5 and up and adults
  - Small mask for infants up to 12 months of age
  - Medium mask for children up to 4-5 years of age
  - Large mask for older children and adults unable to use mouthpiece device
- Stethoscope

PROCEDURE

<table>
<thead>
<tr>
<th>Step</th>
<th>Task Description</th>
<th>Rationale</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. CHECK</td>
<td>Chart for prescriber’s order which specifies the drug name, indication, dosage, route and frequency of administration.</td>
<td>Medication orders that meet safe prescribing practices promote patient safety.</td>
</tr>
<tr>
<td>2. DETERMINE</td>
<td>Which spacer device to use.</td>
<td>Metered dose inhalers (MDI or “puffer”) should be used with a spacer because even when used correctly without a spacer, only about 15% of the medicine gets into the lungs, with much of it collecting in the back of the throat.</td>
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<tr>
<td>3. GATHER</td>
<td>Needed equipment and supplies.</td>
<td>Facilitates completion of procedure in a timely manner.</td>
</tr>
<tr>
<td>4. IDENTIFY</td>
<td>Patient and ENSURE patient and family understand what medication is being given, why and how, any possible side effects, and that questions are answered.</td>
<td>Failure to correctly identify patients prior to procedures may result in errors. Reduces child and family’s anxiety. Evaluates and reinforces understanding of previously taught information and confirms consent for procedure.</td>
</tr>
<tr>
<td>5. ASSIST</td>
<td>Child to a comfortable sitting or semi-Fowler’s position as tolerated.</td>
<td>Improves delivery of the medication to the lower airways.</td>
</tr>
<tr>
<td>6. PERFORM</td>
<td>Hand hygiene.</td>
<td>Routine Infection Control practices; reduces transmission of microorganisms.</td>
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<tr>
<td>7. PERFORM</td>
<td>Respiratory assessment: lung sounds, respiratory rate and effort, oxygen saturation values, peak flowmeter readings and PRAM (Pediatric Respiratory Assessment Measure) Score as indicated.</td>
<td>Determines baseline respiratory status.</td>
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</tbody>
</table>

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<thead>
<tr>
<th>Modified PRAM Score* (Pediatric Respiratory Assessment Measure)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Signs</td>
</tr>
<tr>
<td>Suprasternal Indrawing</td>
</tr>
<tr>
<td>Scalene retractions</td>
</tr>
<tr>
<td>Wheezing</td>
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<tr>
<td>Air Entry</td>
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*Excludes \( O_2 \) saturation

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<td>8. REMOVE</td>
<td>Cap from MDI and SHAKE the MDI well as per instructions on MDI.</td>
<td>Ensures the medication in the canister is mixed equally with the MDI propellant before aerosolizing.</td>
</tr>
</tbody>
</table>

NOTE: The MDI must be well shaken before each
dose in order to deliver the medication correctly. | Use of a spacer increases the likelihood that the full dose of medication will be delivered to the airways.
---|---
9. **INSERT** MDI into the large rubber ring opening of the spacer. | Increases medication delivery.
10. **INSTRUCT** patient to exhale completely if able to follow instructions.

### Spacer with mask:
- **PLACE** mask over child’s mouth and nose making a tight seal.
- **PRESS** the top of the MDI once and **HOLD** spacer on face for at least 5-6 slow, deep breaths.

### Spacer with Mouthpiece:
- **INSTRUCT** patient to seal lips around mouthpiece
- **PRESS** the top of the MDI once and **INSTRUCT** patient to take a slow, deep breath through the mouth (if you hear a whistling sound, the patient is breathing too fast)
- **INSTRUCT** patient to hold the breath for 10 seconds if possible. **If unable to hold breath**, instruct child to take at least 5-6 slow, deep breaths through the mouth.

12. **INSTRUCT** patient to release the breath and breathe normally.

13. **WAIT** the recommended length of time, usually 30 seconds (found on MDI instructions) and **REPEAT** steps 10-12 for each additional prescribed puff, shaking the MDI prior to each dose. | To ensure accuracy of delivered dose.

14. **INSTRUCT** patient to rinse mouth after using inhaled corticosteroids. | Reduces dry mouth, hoarseness and oral yeast or thrush infections.

15. **REPEAT** respiratory assessment and PRAM scoring. | Compare to baseline to evaluate medication efficacy.

16. **REMOVE** equipment and supplies and **PERFORM** hand hygiene. | Routine Infection Control practices; Reduces transmission of microorganisms

17. **STORE** spacer in sealed plastic bag after use. | Keeps out dust and debris.
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CLEANING INSTRUCTIONS FOR THE SPACER:

- Send spacer to SPD for reprocessing weekly or clean spacer with warm soapy water once weekly and leave to air dry overnight. Do not rub dry with a towel.
- Ensure spacer and mask is completely dry before use.
- When dry or following use, store in a clean, sealed plastic bag to keep out dust and debris.

Spacers are “limited use” devices which allow them to be reused and reprocessed between patients. Once the patient has finished using the device or on discharge, send it to Sterile Processing Department (SPD) for reprocessing. When reprocessed, the SPD technician will place an “X” in one of the boxes on the device which indicates it has been used and reprocessed using high level disinfectant and can be used again on another patient. Once the device has 5 X’s it can no longer be reprocessed and can be given to the patient to keep or it should be discarded after use.

DOCUMENTATION

DOCUMENT on appropriate record:
- date and time
- medication, dose, route
- number of doses
- spacer used
- individual administering
- respiratory assessment and PRAM Score pre and post inhalation therapy
- patient’s response to procedure
- patient/family education
- unexpected outcomes and related treatment
- any other pertinent actions or observations

REFERENCES


