AEROSOL TREATMENTS

Purpose:
Aerosolized treatments, when prescribed, may be needed to deliver an aerosolized medication to the lung parenchyma for students in acute respiratory distress or with reduced respiratory flow.

Additional Authority:
Nevada Nurse Practice Act, Nevada State Board of Nursing School Nurse Advisory Opinion.

Scope:
School Nurses, Specialized Procedure Nurses, Contracted Agency Nurses, and designated Unlicensed Assistive Personnel

Responsible Party:
Health Services Director

Distribution:
Health Services Coordinators, School Nurses, Specialized Procedure Nurses, First Aid Safety Assistants, Health Services Department Secretarial Staff

POLICY

1.0 Guidelines

1.1 Licensed Health Care Provider orders are required for aerosol treatments in the school setting and must be renewed annually.

1.2 An aerosol treatment may be administered by the student (if age appropriate), by the registered nurse (RN), or by the licensed practical nurse (LPN).

1.2.1 Pursuant to NRS 392.425, students who self-administer aerosol treatments must be independent per LCHP orders, have parent consent on file and be capable as determined by the school nurse per the student skills checklist.
1.3 An aerosol treatment may only be delegated to unlicensed assistive personnel (UAP) in accordance with the NSBN School Nurse Advisory Opinion.

1.4 Healthcare personnel and designees responsible for the delivery of aerosol treatments should have demonstrated and documented knowledge and skills through monthly verification of training (with the exception of rescue inhalers) related to the following:

1.4.1 Types of aerosol delivery devices and their limitations,

1.4.2 Assembly, care and use of aerosol delivery devices,

1.4.3 Medications being delivered, including contraindications, potential side effects, and desired outcomes,

1.4.4 Recognition, and response to adverse reactions,

1.4.5 Performance of subjective and objective assessments to determine medication efficacy,

1.4.6 Performance of subjective and objective assessments of UAPs to determine ability to use aerosol delivery devices properly to include:

1.4.6.1 Proper use and understanding of aerosol delivery device and delivery technique,

1.4.6.2 Proper assembly, cleaning, and care of aerosol delivery device and medication preparation,

1.4.6.3 Understanding of medication purpose, dosage, indications, and side effects,
1.4.6.4 Ability to alter the medication, as prescribed, when appropriate,

1.4.6.5 Knowledge of when to report to school nurse and/or parent/guardian, and

1.4.6.6 Knowledge of when to activate emergency medical response (EMS) for respiratory distress.

1.4.7 Resuscitation apparatus with masks of appropriate sizes should be available when aerosol treatments are being provided to the student.

1.4.8 Standard precautions and measures to limit the transmission of microorganisms, such as tuberculosis, must be adhered to at all times.

1.4.9 Provision of a medical alert or individualized health care plan for appropriate school staff.

2.0 Equipment

2.1 Arrange for all necessary equipment and supplies, including medication and isotonic diluents, to be provided from home. Each student must have their own nebulizer and tubing provided by the parent/guardian for single person use.

2.1.1 Generator (small-volume nebulizer, large-volume nebulizer, metered-dose inhaler, or dry-powder inhaler) supplied by the parent/guardian.
2.1.2 Power-source for generator supplied by the parent/guardian, as appropriate

2.1.3 Prescribed medication and isotonic diluents supplied by the parent/guardian, if ordered

2.1.4 Flowmeter and oxygen tank with oxygen tubing, supplied by parent/guardian, if oxygen is ordered.

2.2 Disposable gloves and protective mask

2.3 Stethoscope

3.0 Procedures

3.1 SMALL-VOLUME NEBULIZER (SVN): A jet nebulizer powered by compressed air.

3.1.1 Students who are able to cooperate have a mouthpiece with an extension tube that connects to the reservoir.

3.1.2 If student is unable to cooperate, a facemask should be used in place of the mouthpiece.

3.1.3 Students with a mechanical ventilator circuit (or if a manual resuscitation bag is in use) will have a T-connector in place to attach and use with the SVN.

3.1.4 A slow, deep inhalation with an inspiratory pause or hold is performed during SVN treatments.

3.1.5 Tap the sides of the SVN periodically to minimize dead volume.

3.1.6 SVNs are for single-student use only.
3.1.6.1 After each treatment, clean and rinse equipment with water, and air-dry before storing.

3.2 **ULTRASONIC NEBULIZER (UN)**: A nebulizer that utilizes high-frequency energy for the aerosolization of a liquid.

3.2.1 Student does not need to coordinate inhalation nor perform a hold on inspiration for breath actuated devices.

3.2.2 An electrical power source is required.

3.3 **LARGE-VOLUME NEBULIZER (LVN)**: A nebulizer that uses compressed air to deliver medication continuously over a period of time.

3.3.1 Used for thick, tenacious secretions (e.g., cystic fibrosis, bronchiectasis, tracheostomy, or tracheobronchial stent).

3.3.2 Rarely used for children, but if prescribed should be administered using a face mask.

3.3.3 LVNs are for single-student use only.

3.4 **DRY POWDER INHALER (DPI)**: A DPI is a breath-activated device that uses a single-dose medicated gelatin capsule. The capsule is punctured when inserted into the DPI device which releases the dry particles to be inhaled into the lower airway by the student.

3.4.1 Typically, a DPI is only used in students older than 6 years old who can perform a rapid inhalation to activate and fully discharge the DPI effectively.

3.4.2 This method is not usually used for acute asthmatic emergencies but rather for chronic management of asthma.
3.4.3 DPIs are for single-student use only

3.4.3.1 Clean or replace the DPI when dirty.

3.5 METERED-DOSE INHALER (MDI): A pressurized canister that contains medication and propellant.

3.5.1 May be used with a spacer/holding chamber device, if prescribed by a LHCP. Note: A spacer device enhances delivery by decreasing the velocity of the particles and by reducing the number of large particles. A spacer device with a one-way valve eliminates the need for the student to manually activate the inhaler and physically inhale at the same time which increases medication delivery.

3.5.2 MDI actuation occurs at the end exhalation, followed by a slow inspiration and breath hold for 10 seconds. Repeat only as prescribed.

3.5.3 MDIs are for single-student use only.

3.5.3.1 Clean or replace the spacer when dirty

4.0 Procedural Steps

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<thead>
<tr>
<th>ESSENTIAL STEPS</th>
<th>KEYPOINTS-PRECAUTIONS</th>
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<tbody>
<tr>
<td>Verify the order in the student’s Healthmaster record with LHCP orders.</td>
<td>If known allergy to drug, do not administer and notify prescriber.</td>
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<tr>
<td>Perform hand washing.</td>
<td>Reduces transmission of microorganisms.</td>
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<td>When possible, check the prescription with the medication level. Verify the expiration date.</td>
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<td>Confirm the student’s identity by having the student state their full name.</td>
<td>Ensure the “five rights of medication administration” are followed.</td>
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<tr>
<td>name.</td>
<td>Gather necessary equipment and supplies.</td>
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<tr>
<td>Select appropriate aerosol device or hand-held inhaler.</td>
<td>Explain the procedure to the student.</td>
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<td>Don gloves and a protective mask. Masks may be used whenever exposure to droplets is anticipated.</td>
<td>Protect self from exposure to aerosols, medications, and patient-generated respiratory droplets.</td>
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<td>Explain the procedure to the student, as appropriate.</td>
<td>Reassure the student to allay anxiety.</td>
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<td>Follow specific manufacturer’s directions for the equipment that is being used.</td>
<td>Each manufacturer has unique directions for connecting equipment parts for aerosol delivery.</td>
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<tr>
<td>- Assemble the aerosol delivery device, power source, and the interface (mouthpiece, face mask).</td>
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<td>FOR NEBULIZERS (SVN, UN, LVN):</td>
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<td>- Fill the nebulizer chamber, using a syringe to measure the precise amount of isotonic diluent and/or medication ordered, unless supplied as individual unit-doses (e.g., dosettes, vials). Note: Use only sterile fluids for aerosol solutions and dispense them aseptically. Multi-dosed vials are handled, dispensed, and stored following manufacturer’s instructions.</td>
<td>Medication delivery is an exact science. The smaller the child, the smaller the tidal volume and the smaller the actual medication amount that is being delivered. Precision in measuring ensures delivery of the exact dose.</td>
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<td>- Close the chamber.</td>
<td>With aerosol treatments, the duration may vary slightly.</td>
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<td>- Turn on the compressor and use for the prescribed amount of time and until all medication has been nebulized.</td>
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<td>Position the student and place the interface (mouthpiece, face mask) in position for delivery.</td>
<td>Ensure student comfort and improve their ability to finish the procedure.</td>
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<td>- Elevate the head of the bed or place the student in a sitting position.</td>
<td>Prevents medication from escaping</td>
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<tr>
<td>- Remind student to have a good seal with lips, and to breathe</td>
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only through the mouth.  
- If using a face mask, form a tight seal.  

| Monitor vital signs for signs and symptoms of adverse reactions to the treatment.  
- Assess for improvement in respiratory status.  
- Contact LHCP if student’s respiratory status does not improve after a treatment.  
- Contact LHCP if the student exhibits side effects of medication administration.  
- Activate EMS if student continues to be in acute respiratory distress or low respiratory flow persists.  |
| Aerosol treatments may result in adverse reactions, including tachycardia, cardiac arrhythmias, and palpitations.  
- Delivering medication directly to the lungs should result in an improvement of the student’s respiratory status.  |

| When finished, remove mouthpiece or face mask and turn off the nebulizer compressor (if used).  |
| Minimize safety hazards with equipment.  |

| Assist student to rinse their mouth with water after any inhaled administration of steroids.  |
| Prevents oral irritation or overgrowth of opportunistic organisms from medication.  |

| Remove equipment and clean in accordance with manufacturer’s instructions.  |
| Clean equipment reduces the risk of growth of pathogenic organisms between uses. Standard precautions.  |

| Perform hand washing.  |
| Reduces transmission of microorganisms.  |

| FOR DRY POWDER INHALERS (DPI):  
- Remove cap from dry powder inhaler.  
- Load prescribed medication dose per manufacturer’s instructions.  
- Tell student to fully exhale as much air as possible.  
- Have child place the DPI up to their mouth with the lips firmly around the opening so no medication or air can escape around the sides.  
- Have student breath in once through their mouth, very deep  |
| The DPI indicator on top should tell how many doses are left.  
- Ensure medication does not leak out around the lips.  
- DPIs are breath-activated, so it’s
and fast, filling the lungs as deeply as possible.
- Instruct student to take their mouth off of the inhaler and hold their breath for 10 seconds, then exhale slowly. Note: Never breathe into the inhaler.
- Replace the cap on the DPI.  

breathing in deep and fast that give student the right dose of medication.
Medication is infused and permeates the lung parenchyma.

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<tr>
<th>FOR METERED-DOSE INHALERS (MDI):</th>
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<td>Without Spacer/Chamber: Shake MDI inhaler to mix medication.</td>
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<tr>
<td>- Prime the inhaler per manufacturer’s instructions.</td>
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<td>- Have student fully exhale through the mouth.</td>
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<td>- Hold the canister with the mouthpiece on the bottom facing the student, and the canister pointing upward.</td>
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<td>- As recommended by LHCP:</td>
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<td>o Position the open end of the mouthpiece a distance of 2 finger-breaths from the lips, OR</td>
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<tr>
<td>o Position the open end of the mouthpiece into the student’s mouth. Instruct the student to close their lips tightly around the mouthpiece.</td>
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<tr>
<td>- Student will breathe in slowly and deeply through the mouthpiece. At the same time, press down once on the canister to spray the medication into the mouth.</td>
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<tr>
<td>- Hold breath for 10 seconds, remove the inhaler, and breathe out slowly.</td>
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<td>- If 2 or more puffs are prescribed, wait one minute</td>
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<tr>
<td>Identify what method of MDI delivery the student was instructed to use by LHCP.</td>
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<tr>
<td>Remind student to have a good seal with lips, and to breathe only through the mouth.</td>
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between each puff, and repeat above steps.

With Spacer/Chamber: Shake MDI inhaler then connect MDI to the back of the spacer/holding chamber (if ordered).
- Have student fully exhale and place spacer with inhaler attached, into the mouth.
- For controlling medications via a mouthpiece:
  - Press down on inhaler and have student breathe in as slowly and deeply as possible.
  - Have student hold their breath for a count of 8-10 seconds and then remove the spacer and breathe out slowly.
  - Repeat the procedure to deliver additional puffs, if ordered.
  - Remove the spacer from the mouth.
- For spacers with a mask:
  - Place the mask over the bridge of the nose and mouth and press down securely.
  - Refer to manufacturer’s instructions for number of breaths to clear spacer with mask attached.
  - Repeat the procedure to deliver additional puffs, if ordered.
  - Remove spacer with mask from nose and mouth.

Ensure that medication is thoroughly mixed.

Breathing in slowly allows proper delivery of medication into the lungs.

Exhale slowly through pursed lips will keep distal bronchioles open, allowing increased absorption and diffusion of the drug.

Most spacer devices with an attached mask require 5-6 breaths to clear the chamber. Note: Some masks may have one-way valves or a built-in flow signal device. If the one-way valve whistles, the student is breathing too fast. If it does not have a one-way valve, it will not whistle.

Replace the protective cap on the inhaler.

Clean spacer per the manufacturer’s instruction. When used with inhaled
steroids, the spacer should be cleaned after each use. | Clean the inhaler whenever there is “powder” in or around the spray hole. | Standard precautions to reduce transmission risk of microorganisms. |
| Perform hand washing. | Reduces transmission of microorganisms. |
| Return equipment to secured medication cabinet. | The equipment and medications should be easily located for next use. |

5.0 Documentation Required

5.1 Document required training of unlicensed assistive personnel.

5.2 Document required training of student’s who will be independent in aerosol treatment care.

5.3 Document procedure in the electronic medical record (Healthmaster) and electronic billing record (EdPlan).

6.0 References, Sources, Bibliography


7.0 Authorizations

Lynn Row
Health Services Director (Print) | Signature | Date