

# Respiratory Assistance: Mechanical Nebulizer

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A mechanical nebulizer converts a liquid to a fine spray.

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## **I. Personnel Involved**

- A. School nurse
- B. Designated school personnel under indirect supervision
- C. School nurse as an indirect procedural supervisor

## **II. General Information**

- A. A mechanical nebulizer is powered by either oxygen or compressed air that produces a stable aerosol of fluid particles.
- B. An ultrasonic nebulizer contains fluid in a chamber that is vibrated rapidly, causing the fluid to break into small particles that are then carried by a flow of compressed air or oxygen to the pupil.
- C. This procedure requires a physician's written authorization. This service must be reauthorized yearly by the prescribing physician and the parent.

## **III. Guidelines**

- A. Purpose  
To improve breathing by the administration of bronchodilators, mucolytics, or other medications directly into the lungs by means of aerosol instillation; and to provide an atmosphere of high humidity to assist the breakup of pulmonary and bronchial secretions and aid the pupil in coughing them up.
- B. Equipment (Parents are responsible for providing and maintaining equipment.)
  - 1. Air compressor or oxygen
  - 2. Oxygen nipple adapter
  - 3. Connection tubing
  - 4. Mechanical nebulizer manifold or ultrasonic nebulizer with cup and mask
  - 5. Medication or saline solution

# Respiratory Assistance: Mechanical Nebulizer – Procedure

<i>Essential steps</i>	<i>Key points and precautions</i>	<i>Child specific</i>
<ol style="list-style-type: none"> <li>1. Determine the need for the pupil to use the nebulizer at school by reviewing the physician's orders.</li> <li>2. Assess the pupil's respirations.</li>   <li>3. Monitor the heart rate before and after treatment by taking a pulse when bronchodilators are administered.</li>   <li>4. Assemble equipment and medication, as ordered, near the pupil.</li> <li>5. Explain the procedure to the pupil.</li>   <li>6. Wash hands.</li> <li>7. Place the appropriate amount of medication and saline solution or water in the nebulizer.</li> <li>8. Place the pupil in a comfortable sitting position.</li>   <li>9. Have the pupil demonstrate mouth breathing. Have him or her practice if necessary.</li> <li>10. Attach the nebulizer hose to the air compressor or to oxygen and turn it on. A fine mist should be visible.</li> <li>11. Follow the instructions from the manufacturer when an ultrasonic nebulizer is used.</li> <li>12. Have the pupil place the mouthpiece in his or her mouth, if possible.</li>   <li>13. Tell the pupil to breathe in and out through his or her mouth.</li> </ol>	<p>Establish a baseline for rate, depth, effort, noise, color, restlessness, and level of consciousness.</p> <p>Bronchodilators may produce tachycardia, rapid heartbeat, palpitation, dizziness, nausea, and excessive perspiration.</p> <p>Use language and demonstration methods that are appropriate for the pupil's level of development because the effectiveness of this therapy depends on the pupil's efforts.</p> <p>Do not exceed the ordered amount.</p> <p>Expansion of the lungs and movement of the diaphragm are greatest in this position, allowing for maximum treatment of the basilar areas of the lungs.</p> <p>Instruct and demonstrate the technique as needed.</p> <p>A flow rate from 5 to 6 to 8 to 10 liters per minute will provide a treatment time of about 8 to 10 minutes.</p> <p>Instructions vary. See the physician's orders.</p> <p>Use a mask if the pupil cannot use the mouthpiece.</p> <p>When output from the nebulizer appears to have decreased, unplug the device and check the tiny opening for clogging. If the opening is clogged, carefully run a pin through it and rinse well.</p> <p>Noseclips are sometimes used if the pupil has difficulty breathing only through his or her mouth. (This step is performed under a physician's direction.)</p>	

14. Every 2 minutes, or as ordered, have the pupil take an extra deep breath or two, hold his or her breath briefly; then exhale as slowly as possible. Resume normal breathing until time for the next deep breaths.
15. Observe the expansion of the pupil's chest.
16. Remove the mouthpiece or mask if a cough occurs during the treatment, and allow the pupil to clear the secretions completely and then continue the treatment.
17. Give the pupil time to rest during the procedure if needed.
18. Observe the pupil for any adverse reactions such as wheezing (bronchospasm) and excessive fluid deposition causing suffocation.
19. Continue the procedure until all the medication or fluid has been nebulized.
20. Have the pupil take several deep breaths, cough, and spit out the secretion after the treatment.
21. Wash your hands; have the pupil wash his or her hands.
22. On the SPHCS log, document the use of the nebulizer, with or without the pupil's having been given medication.

This technique allows the medication to remain in the lungs longer and facilitates dispersion of the particles.

Deep breaths ensure that the medication is deposited below the oropharynx.  
Turn off the machine when it is not being used.

Wheezing indicates air turbulence and may result from the irritating effect of the medication on the airway or from inability to expectorate the loosened secretions. Wheezing may also indicate improvement of the air exchange if little air movement occurred previously.

Note the length of time for this process.

Demonstrate the procedure if needed.

Record the date and time, the name of the medication used, the duration of the treatment, the respiratory rate and effort, the heart rate before and after the student has been treated with bronchodilators, and a description of the secretions expectorated.

### **Cleaning and Care of the Nebulizer**

Daily thorough cleaning should be done at home.

After each treatment:

1. Rinse the nebulizer, mouthpiece, and/or mask under hot running water.
2. Shake off the excess water
3. Lay these parts on a clean cloth or towel to dry.
4. Cover the nebulizer parts with a cloth or towel.
5. When the parts are dry, store them in a clean plastic bag, the top of which can be sealed. The tubing does not have to be cleaned, but it should be stored in the same bag with the other equipment.