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**Acronyms:**

COPD	Chronic Obstructive Pulmonary Disease
DOB	Date of Birth
FEV1	Forced Expiratory Volume
MAR	Medication Administration Record
O2	Oxygen
RCS	Respiratory Care Services
Rx	Medical Prescription
SaO2	Oxygen Saturation of Arterial Blood
SVN	Small Volume Nebulizer
TLC	Total Lung Capacity
VT	Tidal Volume



## **Policy and Procedure of Small Volume Nebulizer (SVN) Hand- Held Aerosol Treatments**

### **1. Introduction**

Small Volume Nebulizer (SVN) Aerosol Treatments is a medical treatment that is used to treat a variety of breathing conditions. It can be used in the treatment of asthma, chronic obstructive pulmonary disorder (COPD) or other illnesses that impact airway function. Aerosol therapy delivers small amounts of medicine into the lungs. These medications are often used to relax the muscles in the airway to make breathing easier (decrease wheezing), or they are used to fight infections. With a Compressor/Nebulizer it changes liquid medication into a fine, breathable mist so it can easily be inhaled directly into the lungs.

### **2. Scope**

This policy is applicable to all Respiratory Therapist and Nurses in all health care institutions of Ministry of Health.

### **3. Purpose**

- 3.1. To guide the healthcare provider of the operation instructions prior to giving aerosol therapy.
- 3.2. To standardize the delivery of inhalation aerosol drug therapy via small volume (hand-held) nebulizer
- 3.3. To provide the proper technique for the correct usage of small volume nebulizers for effective aerosol treatments.

### **4. Definitions**

- 4.1. Small-Volume Nebulizer: The SVN is an aerosol generator that converts liquid drug solutions or suspensions into aerosol and is powered by compressed air, oxygen, a compressor, or an electrically powered device.
- 4.2. Bronchoconstriction: is the constriction of the airways in the lungs due to the tightening of surrounding smooth muscle, with consequent coughing, wheezing, and shortness of breath
- 4.3. Bronchodilatation: the dilation of the airways in the lungs due to the relaxation of surrounding smooth muscle. It is the opposite of bronchoconstriction.



- 4.4. Bronchodilators: drug that relaxes bronchial muscle resulting in expansion of the bronchial air passages
- 4.5. Bronchospasm: or a bronchial spasm is a sudden constriction of the muscles in the walls of the bronchioles or when the muscles in the lungs tighten, causing restricted airflow
- 4.6. Nebulizer is a small device that can convert a drug from a solution into an aerosol form by means of a compressor/compressed gas source.

## 5. Policy

- 5.1. All healthcare providers shall be familiar and adhere to policies and procedures established by the RCS in providing aerosol therapy using small volume nebulizers.
- 5.2. Respiratory Care Services will provide equipment and therapy for the aerosolization of pharmacological agents to maintain airway patency and provide clearance of retained secretions.
- 5.3. A physician's order is necessary to deliver aerosolized medication therapy
- 5.4. Documentation shall be performed as often as necessary during aerosol treatments including the time, date, mode of therapy or device used, medications, sputum characteristics, breath sounds, and indications of effective cough must be recorded in the patient's chart post each treatment.

## 6. Procedure

- 6.1. Equipment Needed:
  - 6.1.1. Stethoscope
  - 6.1.2. Small Volume Nebulizer
  - 6.1.3. Medication
  - 6.1.4. Small bore connective tubing
  - 6.1.5. Aerosol Face Mask (optional) / Trache mask (optional)
  - 6.1.6. Air or Oxygen flow meter with appropriate nipple adapter Note: An air flow meter should be used for those COPD patients on O2 Drive
  - 6.1.7. Plastic Treatment/Equipment Setup Bag
- 6.2. Obtain the necessary equipment in the respiratory therapy equipment room or designated respiratory supply cabinet for the unit. Proceed to the patient's nursing unit.
- 6.3. Check the patient's order sheet for the doctor's specific instructions.



- 6.4. Verify medication dosage, frequency, and duration of therapy, if specified. Review the patient's chart for admission diagnosis, medical history, therapeutic indications and possible contraindications. Verify the patient's name, DOB, and bed location.
  - 6.4.1. Indications:
    - 6.4.1.1. Relief of bronchospasm (bronchoconstriction)
    - 6.4.1.2. Promote bronchodilatation
    - 6.4.1.3. Airway inflammation
    - 6.4.1.4. Mucosal edema
    - 6.4.1.5. Mobilization of bronchial secretions
    - 6.4.1.6. Hydrate secretions
    - 6.4.1.7. Deliver pharmacologic agents
  - 6.4.2. Contraindications:
    - 6.4.2.1. Unstable cardiac status
    - 6.4.2.2. Cardiac Arrhythmias
    - 6.4.2.3. Hypersensitivity or allergy to drug
- 6.5. Proceed to patient's bed, introduce yourself, and explain what you are about to do and that it has been ordered by the patient's doctor. Check the patient's name and DOB verbally and by the patient's wrist band. Be reassuring.
- 6.6. Explain the desired outcome goal for the treatment. Explain what the patient must do to receive the treatment and that specific instructions will be provided to promote the desired effect and administration of the nebulizer treatment.
- 6.7. Wash your hands. Maintain universal precautions as indicated.
- 6.8. If the patient requires suctioning, suction in accordance with departmental policy and procedures.
- 6.9. If a patient is asthmatic, measure and record Peak Flow pre and post treatment.
- 6.10. Connect flow meter with nipple adapter to gas source outlet. Attach one end of the small bore connective tubing to the nipple adapter and the other end to the inlet port of the Small Volume Nebulizer (SVN).
  - 6.10.1. If oxygen is used to power aerosol devices for short-term treatments, applicable oxygen safety procedures must be observed.



- 6.11. Either a mouthpiece or aerosol face mask will be attached to outlet port of SVN. (A trache mask will be used for tracheotomy patients)
- 6.12. Position patient in order for the nebulizer will be in a vertical position when either the mouthpiece or aerosol face mask is being used by the patient. Patient should be sitting as straight as possible, semi-fowler position preferably. Note: Medication will not nebulize properly if the nebulizer is tilted too much. In patients who are unable to sit up for the nebulizer treatment, a length of aero tubing between the face mask and the nebulizer will assist in providing the necessary leeway to ensure the proper positioning of the nebulizer.
- 6.13. Instruct patient in proper techniques for effective Rx (i.e. breathing pattern, inspiratory depth, and breath holds.
  - 6.13.1. For aerosol treatment with mouthpiece, instruct patient to inspire/exhale aerosolized medication (mist) through the mouthpiece with closed lips around mouthpiece to maintain seal.
  - 6.13.2. For aerosol treatments with aerosol face masks, instruct patient to inspire/exhale aerosolized medication (mist) through a slightly open mouth.
  - 6.13.3. The pattern of their breaths (inhalation/exhalation phase) during the treatment period will be slow, normal depth (normal tidal breath volume -  $VT < .5L/sec$ ).
  - 6.13.4. Periodically the patient will provide slow, deeper breaths (approaching TLC) with a breath hold performed for 4-10 seconds as patient tolerates.
- 6.14. Record respiratory clinical assessment of patient before Rx on the patient's Respiratory Care Treatment sheet located on the patient's bedside clipboard ( be sure to include breath sounds, heart rate, respiratory rate, cough and secretions assessment, SaO<sub>2</sub> , supplemental O<sub>2</sub> /delivery device, and peak flow if applicable).
- 6.15. Place the prescribed medication into the SVN, attach either aerosol face mask or mouthpiece with T-piece to the SVN outlet port, properly position device. Turn the flow meter to a recommended flow rate of 6 – 8 lpm.
- 6.16. Observe the aerosol mist generated to be sure the nebulization is adequate and, if necessary, adjust the flow rate.
- 6.17. Observe the patient for any signs of hyperventilation or adverse reactions to medications. Treatment time generally is less than 10 minutes. Instruct patient and





encourage patient to cough so as to raise secretions. Suction, if necessary, in accordance with departmental policy and procedures.

- 6.17.1. If adverse medication reaction occurs, immediately stop treatment. Notify nurse and physician
- 6.18. At the end of the treatment, remove the nebulizer from the patient, shut off the flow meter. Disconnect the connective tubing from the flow meter. Disassemble SVN, removing any residual medication remaining. Rinse SVN and mouthpiece/T-Piece (or aerosol mask) with sterile water (shaking out excess moisture) and have it air dried. Store the setup at the patient's bedside in the Treatment/Equipment Setup Bag (which is clearly marked with the patient's name, room/bed location, and date equipment dispensed) so it will be ready for the next scheduled treatment.
- 6.19. Record respiratory clinical assessment of patient post Rx on the patient's Respiratory Care Treatment sheet located on the patient's bedside clipboard (be sure to include breath sounds, heart rate, respiratory rate, cough and secretions assessment, SaO<sub>2</sub>, supplemental O<sub>2</sub> /delivery device, and peak flow if applicable).
  - 6.19.1. If your assessment indicates that the patient's treatment orders should be changed or that therapy should be discontinued, document your assessment and recommended changes in the progress notes section of the patient's chart. Notify ordering physician of same and request his review of your recommendations.
  - 6.19.2. Therapy must not be discontinued or modifications made unless a written order is placed in the Physician's Order section of the patient's chart
- 6.20. Review Outcome Criteria.
  - 6.20.1. Outcome Criteria:
    - 6.20.1.1. Improvement on exam of wheezes or air movement
    - 6.20.1.2. Improvement of Peak Flow or FEV<sub>1</sub> >15%
    - 6.20.1.3. Improved mobilization of sputum during or after treatment
- 6.21. If the outcome criteria are not met, reassess patient for appropriateness of therapy and present your findings to the ordering physician. If your assessment indicates that therapy is not appropriate for this patient at this time but the physician does not agree,



do the therapy as ordered but contact the Medical Director for the review of appropriateness.

6.22. Properly document respiratory charges for equipment and therapy, record treatment in the MAR.

## **7. Responsibilities**

### **7.1. Respiratory Therapists are responsible for:**

- 7.1.1. Teaching the patients about the correct and accurate use of small volume nebulizers/ nebulization in order to reduce the complications and adherence to the inhaled medications
- 7.1.2. Assembly of the device to use, initiation, discontinuance, cleaning and documentation of the procedure
- 7.1.3. Encouraging patient to perform deep breathing and coughing exercises to help remove expectorate mucous.

### **7.2. Nursing Staff is responsible for:**

- 7.2.1. Giving care to the patients connected to SVN/ nebulizer machine and be trained enough to give effective and safe care to such patient
- 7.2.2. Teaching the patients about the correct and accurate use of small volume nebulizers/ nebulization in order to reduce the complications and adherence to the inhaled medications
- 7.2.3. Assembly of the device to use, initiation, discontinuance, cleaning and documentation of the procedure
- 7.2.4. Encouraging patient to perform deep breathing and coughing exercises to help remove expectorate mucous



### 8. Document History and Version Control

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Respiratory Care Services Team		Khalsa Al Siyabi	Dr. Kadhim Sulaiman

### 9. Related Documents:

There is no related document for this policy.

**10. References:**

<b>Title of book/ journal/ articles/ Website</b>	<b>Author</b>	<b>Year of publication</b>	<b>Page</b>
AARC Clinical Practice Guidelines – Selection of Aerosol Delivery Device, Respiratory Care.,		1992	37:891-897
Respiratory Care Pharmacology, Fourth Edition	Rau, Jr. Joseph L	1994	
Quick Reference to Aerosolized Agents in Respiratory Care, Fourth Edition, 1994		1994	
Aerosol Therapy in Pulmonary Critical Care Respiratory Care DOI: <a href="https://doi.org/10.4187/respcare.03790">https://doi.org/10.4187/respcare.03790</a>	Arzu Ari	June 2015	60 (6) 858-879
<a href="https://opentextbc.ca/clinicalskills/chapter/inhaled-and-topical-medications/">https://opentextbc.ca/clinicalskills/chapter/inhaled-and-topical-medications/</a>			