



## Critical Care Therapy and Respiratory Care Section

Category:	Clinical
Section:	Aerosol Therapy
Title:	Continuous Aerosol Administration
Policy #:	01
Revised:	03/00

### 1.0 DESCRIPTION

1.1 Definition: Continuous aerosol administration is the delivery of cool or heated aerosolized sterile water to the upper airways. Aerosol delivery may include use of an oxygen source gas when oxygen therapy is indicated; otherwise, a compressed air source is required to power the aerosol generator. The aerosol generator prescribed is one of the Misty Ox system of nebulizers used with standard hospital sterile water. These devices provide  $\text{FiO}_2$  delivery from 0.28 to 1.0 with guaranteed high flow delivery at  $\text{FiO}_2$ s of 0.60 to 1.0. See 2.2. Equipment and Materials for further description of these devices.

### 1.2 Indications:

1.2.1 *Cool* aerosol administration may be indicated for relief of upper airway edema such as in laryngotracheobronchitis, subglottic edema, postextubation edema, and postoperative management of the upper airway.

1.2.2 *Heated* aerosol administration may be indicated for minimizing the humidity deficit created by the bypassing of the upper airway such as in the tracheostomized patient or in the intubated, nonventilated patient.

1.2.3 Aerosol therapy may also be indicated as an adjunct for bronchial hygiene to hydrate secretions, promote cough, and restore the mucous blanket.

### 1.3 Contraindications

1.3.1 Bronchoconstriction

1.3.2 History of airway hyperreactivity to sterile water aerosolization

- 1.4 Complications
  - 1.4.1 Wheezing or bronchospasm
  - 1.4.2 Overhydration
  - 1.4.3 Swelling of inspissated secretions with resultant increased work of breathing
  - 1.4.4 Alterations in patient temperature
  - 1.4.5 Bacterial contamination
- 1.5 Precautions
  - 1.5.1 Patients must be monitored throughout aerosol therapy for signs of bronchospasm and increased work of breathing.
  - 1.5.2 Patients with an ineffective cough and/or an inability to clear secretions should have appropriate suction apparatus at the bedside.
  - 1.5.3 When a heated aerosol is being delivered, the temperature of the aerosol should be monitored proximal to the patient's airway. Patient body temperature should also be monitored during any aerosol administration.
  - 1.5.4 Patients should be monitored for signs of overhydration, i.e. edema, polyuria, and hyponatremia.
  - 1.5.5 When therapeutic oxygen is being delivered in conjunction with the aerosol, patients must be monitored for the appropriateness of oxygen therapy (See the CCTRCS Oxygen Therapy Procedure).
  - 1.5.6 Ensure that tubing condensate is drained at regular intervals to avoid alterations in the  $FiO_2$ . The condensate should be drained away from the patient, and **not** back into the nebulizer, to avoid contamination of the patient with potentially infectious condensate.
  - 1.5.7 Ensure that the source gas flow is adequate to meet the patient's minute ventilation. Refer to the package insert or the label on each Misty Ox device for total flow delivery information. See 2.2 Equipment and Materials for further instruction on the choice of a nebulizer device.

- 1.5.8 Because of the cough-provoking potential of aerosol therapy, appropriate precautions for the minimization of risk to health caregivers, patients, and others of tuberculosis must be strictly followed. See the Centers for Disease Control Guidelines for explanation of “at risk” patients for whom these precautions must be taken.
- 1.6 Adverse Reactions and Interventions
  - 1.6.1 If wheezing or bronchospasm develops in a patient receiving aerosol therapy, discontinue the aerosol and provide an alternate source of oxygen if indicated. Notify the physician and assess the need for bronchodilator therapy.
  - 1.6.2 Initiate or discontinue the use of a heating device as indicated by patient temperature and tolerance.
  - 1.6.3 For patients who exhibit signs of overhydration, an alternate source of humidification should be obtained if indicated.

## 2.0 EQUIPMENT AND MATERIALS

- 2.1 Oxygen and/or air source gas with flowmeter(s)
- 2.2 Misty Ox nebulizer:
  - 2.2.1 Use the Multifit-Nebulizer for FiO<sub>2</sub> delivery of 0.28 to 0.60 when patient total flow needs are average to low. The maximal flow available to the patient at an FiO<sub>2</sub> of 0.60 is 28 LPM.
  - 2.2.2 Use the “HI-FI” High Flow High FiO<sub>2</sub> Nebulizer when the FiO<sub>2</sub> required is 0.60 to 0.96 with high inspiratory flow demands. The maximal flow at 0.60 and 0.96 is 61 LPM and 42 LPM, respectively.
  - 2.2.3 Use the Gas Injection Nebulizer (GIN) for patients requiring 100% oxygen and high flows. The GIN may also be powered with air for *precise* low FiO<sub>2</sub> delivery. The maximal flow available is 110 LPM depending on the FiO<sub>2</sub> setting. Refer to the GIN package insert for additional instructions on the use of this device.

**NOTE:** The Misty Ox Nebulizers must be used only as prescribed. Do not set them up in tandem and do not position the Entrainment Control Dial anywhere other than at those FiO<sub>2</sub> settings which are clearly marked. A point between 0.40 and 0.60 does **not** provide 50% oxygen.

**NOTE:** The use of high flow (0-70 LPM) flowmeters is recommended when using the HI-FI and GIN Nebulizers. If a high flow flowmeter is not available, use a standard flowmeter in the “flush” position to power either of these nebulizers.

- 2.3 Standard 38 mm thread hospital sterile water bottle
- 2.4 Corrugated tubing
- 2.5 Appropriate patient application device, i.e. aerosol mask, face tent, tracheostomy collar, T-piece, or head tent/hood
- 2.6 Water drainage bag
- 2.7 Heating device and thermometer with adapter (if indicated)

### **3.0 PROCEDURE**

- 3.1 Verify the physician’s order for therapy.
- 3.2 Collect the appropriate equipment.
- 3.3 Introduce yourself and explain the procedure to the patient.
- 3.4 Wash hands thoroughly and assemble the equipment.
- 3.5 Check equipment for proper function to ensure there is adequate delivery of flow and aerosol to the patient.
- 3.6 Position the patient application device appropriately.
- 3.7 Be assured that the patient is reasonably comfortable and tolerating the aerosol device before leaving the bedside.

### **4.0 POST PROCEDURE**

- 4.1 Monitor the patient for adverse reactions throughout the therapy as described in 1.6 Adverse Reactions and Interventions.
- 4.2 Monitor the patient for the effectiveness of therapy as evidenced by improvements in stridor, secretion clearance, work of breathing, and breath sounds.
- 4.3 Change equipment as specified in the CCTRCS Changing of Equipment Policy.

**5.0 CHARTING:** Document the initiation, discontinuation, tolerance, and effectiveness of therapy on the “Comments” side of the Continuous Ventilation Record as per appropriate policies (See CCTRCS policies for Documentation of Respiratory Treatments/Assessment and Oxygen Administration, and the Procedure for Patient Assessment).

## **6.0 REFERENCES**

- 6.1 CCTRCS Oxygen Therapy Procedure
- 6.2 AARC. Clinical practice guideline “bland aerosol administration.” *Respir Care* 1993;38:1196-1200.
- 6.3 CCTRCS Patient Assessment
- 6.4 CCTRCS Changing of Equipment Policy
- 6.5 Rau JL. Humidity and aerosol therapy. In: Barnes TA, ed. *Respiratory care practice*. Year Book Medical Publishers, Inc., 1998:164-180.
- 6.6 Centers for Disease Control. Guidelines for preventing transmission of tuberculosis in healthcare settings, with special focus on HIV-related issues. *MMWR* 1990;39(RR-17):1-29.

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