
COOPER UNIVERSITY HEALTH CARE

Children's Regional Hospital Policies and Procedures

Notice: The official version of this Policy is contained in Cooper Policy Network and may have been revised since the document was printed.

- I. PURPOSE:
 - A. To provide the policy and procedure for the safe and effective delivery of aerosolized albuterol through a high flow nasal cannula system.

- II. SCOPE:
 - A. Respiratory Therapy
 - B. Pharmacy
 - C. PICU Nursing

- III. DEFINITIONS:
 - A. Albuterol: beta₂-receptor agonist that relaxes bronchial smooth muscle
 - B. PICU: Pediatric Intensive Care

- IV. POLICY:
 - A. Aerosolized albuterol use through a high flow nasal cannula system is restricted to:
 - 1. Patients admitted to the PICU
 - B. The administration of albuterol through the high flow nasal cannula system will be initiated upon the receipt of a physician's order by a registered respiratory therapist and the PICU nurse.
 - C. The albuterol and the smart infusion pump will be set up by the PICU nurse
 - 1. Infusion pump flow rate is adjusted to deliver albuterol solution that will result in a desired aerosolized dose per hour as ordered.
 - 2. The PICU nurse shall change medication syringe every 24 hours or as needed depending on the rate.
 - 3. The blue Aerogen[®] respiratory tubing will be changed by the respiratory therapist for continuous inhalation administration at least every 72 hours.
 - 4. The smart infusion pump will be affixed to the high flow nasal cannula pole.
 - D. Respiratory therapy is responsible for the setup and administration of inhaled albuterol via the Aeroneb[®] nebulizer and the high flow nasal cannula system
 - E. Respiratory therapy shall assess the patient before, during and after albuterol inhalation therapy.
 - F. The PICU nurse shall ensure adequate supply of albuterol is available on the unit once therapy is initiated, calling pharmacy for additional syringes at least 1 hour in advance.
 - G. Pharmacy is responsible for mixing and labeling of inhaled albuterol in a blue Aeroneb[®] 60 mL syringe.

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1. Pharmacy shall prepare 20 mL of a 5 mg/mL concentration of albuterol in a 60 mL blue Aerogen® syringe.
2. Bag will be labeled "For Inhalation Only"

H. Administration of aerosolized albuterol through a high flow nasal cannula system will require double sign of in the MAR by the PICU nurse and respiratory therapist

V. POLICY IMPLEMENTATION:

A. Major indications:

1. Status asthmaticus
2. Reactive airway disease
3. Bronchiolitis

B. Contraindications:

1. Heart rate sustained over 160 beats per minute
2. ST changes on electrocardiogram

C. Precautions:

1. Albuterol must be administered via a dedicated line (BLUE Aerogen® respiratory tubing for continuous inhalation) that is connected directly to the nebulizer in the high flow nasal cannula system by the respiratory therapist.

VI. PROCEDURES:

A. Equipment:

1. Smart infusion pump
2. Syringe channel for infusion pump
3. Aerogen® nebulizer and generator
4. Blue Aerogen® respiratory tubing for continuous inhalation administration
5. Albuterol in 60 mL for inhalation in BLUE Aerogen® syringe

B. Guidelines for Initiating Therapy:

1. Inhaled albuterol via nasal cannula system may only be administered in the pediatric intensive care unit

C. Pharmacy Order Verification:

1. Before an order can be verified in EHR, the verifying Pharmacist shall confirm that the patient is located in the pediatric intensive care unit.
 - a. If the patient is not located in an approved setting, the pharmacist shall contact the physician and inform them that the patient cannot receive inhaled albuterol via high flow nasal cannula in the non-permitted patient care area.

D. Medication Preparation, Dispensing and Stability:

1. Preparation

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- a. Withdraw 20 mL of undiluted albuterol sulfate inhalation solution 0.5% (5 mg/mL) into a 60 mL BLUE Aerogen[®] syringe
 - b. Pharmacy shall prepare and dispense albuterol ONLY in ready-to-infuse 60 mL BLUE Aerogen[®] syringes.
 2. Dispensing
 - a. Pharmacy shall dispense 1 syringe upon therapy initiation.
 - b. At the time of dispensing, the Aerogen[®] syringes of albuterol must be labeled with the patient-specific EHR label, an expiration date, a "For Inhalation Only" label, and a "Protect From Light" label.
 3. Stability
 - a. Albuterol solution is stable for 24 hours at room temperature and protected from light
- E. Continuous medication administration through high flow nasal cannula system:
 1. PICU nurse and respiratory therapist will independently verify physician order in EHR
 2. PICU nurse will:
 - a. connect blue tubing delivered by respiratory therapist to the blue syringe with Albuterol medication
 - i. medication will be delivered from the pharmacy
 - b. prime blue tubing with medication
 - c. insert blue syringe with medication into the smart pump syringe channel
 - d. will setup and manage smart infusion pump with collaboration from RT (Use ideal body weight)
 3. Respiratory therapist will:
 - a. select appropriate high flow nasal cannula (goal of 50% occlusion)place Aerogen[®] nebulizer on the continuous high flow nasal cannula circuit.
 - b. place assembled Aerogen[®] Circuit into the unit. This is a high flow system and a high flow cartridge must be use (ie: 5-40lpm).
 - c. prime tubing with sterile water prior to Aerogen[®] placement
 - d. remove and dispose of white cap and attach Aerogen[®] Medication Cup
 - e. close Panel Door without pinching either electrical power cord, Aerogen[®] tubing or Water Line
 - f. Connect blue tubing from medication Syringe to Aerogen[®] Medication CupSet Aerogen[®] Generator to "continuous" mode
 4. PICU nurse and respiratory therapist will verify affix appropriate labels to system:
 - a. Label high flow Circuit with "Aerosolized albuterol in use, DO NOT ADMINISTER ANY OTHER AEROSOLIZED MEDICATIONS"
 - b. Label syringe pump with "For Inhalation Only" label
 5. Respiratory therapist will Verify Aerogen[®] is aerosolizing or misting the medication.
 6. PICU nurse will check the remaining syringe volume hourly and send infogram to pharmacy for refill approximately 1 hour in advance.
- F. Documentation:

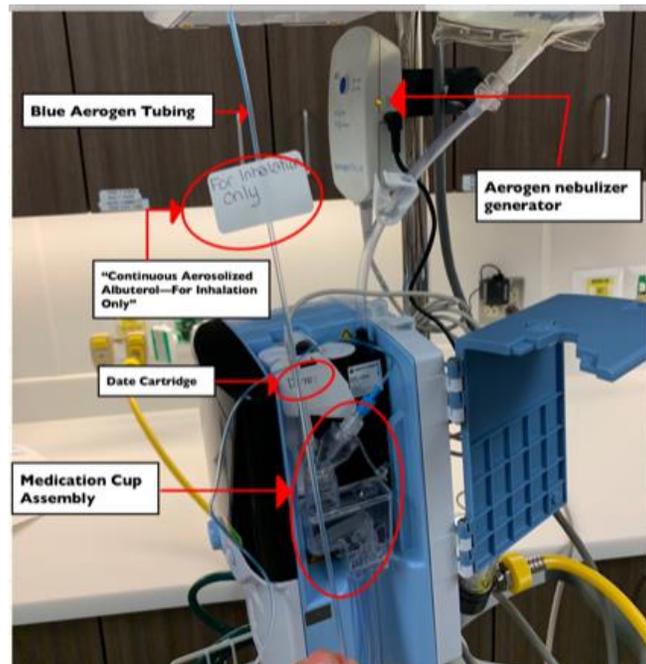
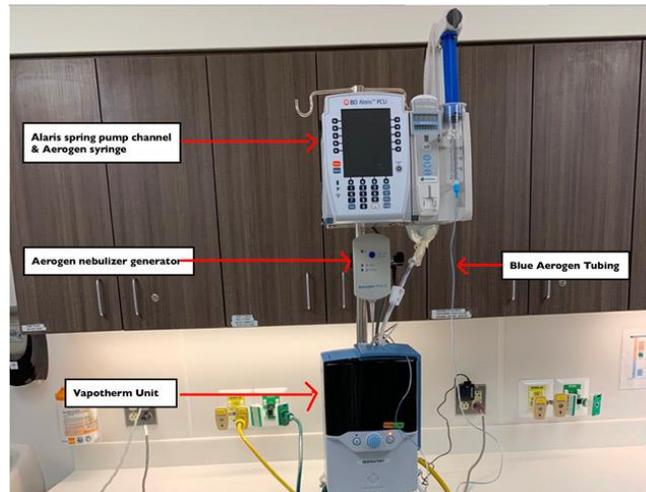
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1. PICU nurse will scan patient prior to medication administration
 2. PICU nurse and respiratory therapist will double sign medication administration in the MAR at the initiation of medication, rate changes or syringe change
- G. Transport will be managed by respiratory therapist:
1. If medical plan includes transport of patient to testing areas, start the continuous treatment on a high flow nasal cannula transport unit.
 2. Ensure the Aerogen® nebulizer is plugged into a fully charged Aerogen® nebulizer generator.
 - a. Note: During transport, the Aerogen® nebulizer generator operates on a 9-volt battery and automatically changes to 30 minute interval mode when the AC power is unplugged
 - b. Note: Minimize therapy disruptions as much as possible, as sudden withdrawal can lead to symptoms associated with rebound pulmonary hypertension, including dyspnea, hypoxemia, and dizziness.
 3. Once patient has reached destination, plug in the AC adapter, and change Aerogen nebulizer generator to continuous mode
- H. Maintenance of the system will be managed by respiratory therapist:
1. Clamp and drain hanging high flow nasal cannula collection bottle every 24 hours.
 2. Replace sterile inhalation water bag as needed.
- I. Patient monitoring:
1. Cardiopulmonary continuous monitoring
 2. Vital signs obtained per orders and prn

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