28 BLS Administration of Nebulized Albuterol

Adopted: 17 March 2019 Effective: 17 March 2019
Changed: 08 June 2021 Effective: 08 June 2021

28.1 Purpose and Expected Results

Asthma, and death from asthma, is increasing in the United States. A severe asthma attack can rapidly progress to respiratory failure and death. Nebulized albuterol sulfate (aka Proventil, AccuNeb, Ventolin, Volmax, Sabutamol) is a bronchodilator and has been proven effective in the management of critical asthma patients. However, albuterol cannot be administered without risk or side-effects, e.g. dysrhythmias and anaphylaxis; thus, proper training in the indications, contra-indications, and management of consequences is imperative.

Consistent with the Squad's goal of superior pre-hospital patient care, for treatment of a severe asthma attack, a properly trained EMT may and should administer albuterol, using a nebulizer. The objective is to reverse a threat to life.

28.2 Circumstances of Applicability

A patient presents with, or develops, the signs and symptoms of a severe asthma attack.

28.3 Requisites

- A patient exhibiting the signs and symptoms of a severe asthma attack
- Normal ALS interventions cannot be performed in a timely manner
- Availability of albuterol sulfate and the means to proper administer it
- An EMT currently trained in the administration of albuterol sulfate

28.4 Procedure Description

28.4.1 Required Training

All Squad members that provide patient care at the BLS level shall complete a training course approved by Village of Owego EMS and Medical Director..

28.4.2 Signs and Symptoms

The signs and symptoms of a severe asthma attack include:

- Dyspnea
- Wheezing
- Tachypnea
- Tachycardia
- Use of accessory muscles of breathing
- Reduced tidal volume (Cannot complete sentences)
- Diminished or absent lung sounds

- Prolonged expiration
- Cyanosis or pallor
- Cough
- Anxiety
- Tripod positioning
- Nasal flaring (infants and toddlers)
- Reduced SpO_2

28.4.3 Medication Characteristics

28.4.3.1 Name

Generic: albuterol sulfate
Trade: Proventil, AccuNeb, Ventolin, Volmax, Sabutamol, ProAir, Etc.

28.4.3.2 Action

Relieves bronchial spasms that narrow the airway.

28.4.3.3 Mechanism

Beta-2-adrenergic agonist. Sympathomimetic. Stimulates the production of intracellular cyclic AMP enhancing the binding of intracellular calcium to the cell membrane and endoplasmic reticulum, resulting in smooth muscle relaxation and bronchodilation. Enhances mucociliary clearance.

28.4.3.4 Indications

Symptomatic bronchospasm due to asthma, chronic bronchitis, emphysema, allergic reaction, anaphylaxis.

28.4.3.5 Contraindications

Hypersensitivity to albuterol sulfate, pheochromocytoma.

Relative:
Diabetes, heart disease, irregular heartbeat, high blood pressure, low blood levels of potassium, seizures (convulsions), thyroid disease, liver dysfunction, kidney dysfunction.

28.4.3.6 Side Effects

Aggression, agitation, allergic reaction, anxiety, back pain, chest pain or discomfort, chills and fever, coordination problems, cough, decreased appetite, depression, difficulty speaking, diabetes, diarrhea, dizziness, drowsiness, dry mouth and throat, excitement, fluid retention and swelling, flushing, general bodily discomfort, headache, heart palpitations, heartburn, hives, increased appetite, increased blood pressure, increased difficulty breathing, indigestion, irritability, labored breathing, leg cramps, light-headedness, muscle cramps, muscle spasm, nasal inflammation, nausea, nervousness, nightmares, nosebleed, over activity, rapid heartbeat, rash, respiratory infection or disorder,

restlessness, ringing in the ears, shakiness, sleeplessness, slowed movement, stomachache, stuffy nose, sweating, swelling of mouth and throat, taste sensation on inhalation, throat irritation, tooth discoloration, tremors, unusual taste, urinary problems, vomiting, weakness, wheezing

28.4.3.7 Dose

Typical: 2.5 mg

28.4.3.8 Administration

Diluted in normal saline (3 mL), aerosolized in a nebulizer, and inhaled over a period of 5 to 15 minutes.

28.4.3.9 Packaging

Unit dose of 2.5 mg in 3 mL normal saline (0.083%) in a jar or an HDPE ampule.

28.4.4 Procedure

Do not delay transport. Do not delay treatment to solicit a patient's medical history (except: age, asthma, prior or current prescription for albuterol, allergies, and cardiac history.) This protocol is applicable for patients who are experiencing wheezing and respiratory distress. For patients with severe respiratory distress, request advanced life support (ALS). If patient exhibits signs of imminent respiratory failure, refer to NYS BLS Protocol for adult or pediatric respiratory arrest/failure.

1. Maintain the airway
2. Monitor breathing
3. Place the patient in a Fowler's or Semi-Fowler's to upright position (the patient's position of comfort)
4. Administer oxygen
   - If tolerated O_2 at 10 to 15 LPM via NRM; else O_2 at 6 LPM via NC, if SpO_2 saturation is less than 94%. *
   - Consider O_2 at 6 LPM via NC during nebulizer treatment, if SpO_2 saturation is less than 94%. *
5. Limit physical activity.
6. Assessment: Access and document the following prior to administration of the first albuterol treatment, and subsequently:
   a. Vital signs, including SpO_2 if available
   b. Respiratory status—verify patient is in respiratory distress, not respiratory failure
      - Ventilations do not require assistance
      - Patient can speak in complete sentences
      - Exhibited signs and symptoms
      - Assessment of severity: (0 to 10 scale)
   c. Lung sounds—auscultate lungs
      - Wheezes
      - Diminished

- Prolonged expiration

7. Consider contact with medical control for consultation prior to administering albuterol for patients with a history of any of:
   - Angina
   - Myocardial infarction (MI)
   - Arrhythmia/dysrhythmia
   - Congestive heart failure (CHF).
8. Contact Medical control for any patient refusing medical assistance or transport. Do not administer albuterol to a patient with an allergy (hypersensitivity) to albuterol. Do not administer albuterol to a patient in respiratory failure.
9. Begin transport as soon as feasible
10. Administer Albuterol Sulfate 2.5 mg in 3.0 mL (cc) via nebulizer (1 unit dose). Set oxygen flow rate of 6-8 liters per minute or at a rate that will deliver the solution over 5 minutes to 15 minutes. Verify the oxygen flow rate nebulizes (aerosolizes) the albuterol, creating a cloud-like mist. If a mask is used in conjunction with the nebulizer, make certain that the mask exhaust ports are free from obstruction.
11. Reassess the patient.
12. After initial dose, if symptoms persist, a second and third dose may be given. Contact medical control for further orders if symptoms persist beyond the third dose.
13. Continue to reassess the patient (see “Assessment” above).
14. Upon completion of patient treatment and transfer of patient care to an ALS provider or receiving hospital staff, document all findings, treatments, and effects on the PCR (ePCR).

* Oxygen saturation should be taken into consideration with normal baseline depending on disease process.