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DEPARTMENT OF HEALTH

BUREAU OF EMERGENCY MEDICAL SERVICES

CPAP For BLS Training Module

1. Introduction

- CPAP is a non-invasive procedure that is easily applied and can be easily discontinued without patient discomfort.
- CPAP application in cardiogenic pulmonary edema appears to be beneficial to patient outcome.

2. Objectives

- Overview of Pulmonary Anatomy & Physiology
- Overview of Respiratory Distress
- Overview of CHF
- CPAP Introduction & Overview
- Pre-hospital indications for CPAP usage
- Contraindications for CPAP Usage
- CPAP Hazards
- CPAP BLS Protocol
- CPAP Procedure
- CPAP Removal
- Documentation Requirements

3. Signs & Symptoms of Respiratory Distress

- Increased effort of Breathing
- Retractions and accessory muscle use
- Unequal or inadequate chest expansion
- Diminished, absent or noisy breath sounds
- Anxiety or restlessness
- Respiratory rate >25/min.
- SPO₂ < 90%
- Pale, cyanotic, cool, moist skin

CPAP Candidate Case Study

Each EMT is expected to make an accurate assessment of a patient in respiratory distress and determine whether or not they are a candidate for CPAP.

Patient Scenario

Dispatch: You are dispatched for a 70 y/o male patient with breathing problems
HPI: Increasing shortness of breath for 1 day despite the use on his inhalers
PMH: COPD, Hypertension, and Diabetes
MEDS: Albuterol Inhaler, Lasix and Aspirin
PE: Thin white male on home oxygen, breathing through pursed lips, sitting in tripod position



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VITALS: BP 180/90, Heart Rate 120, Respiratory Rate 30, O2 Sat 88%, LOC Alert, Airway patent

PE Details: HEENT: Perioral cyanosis, No JVD Pulmonary: Lung sounds reveal inspiratory and expiratory wheezes Extremities: Cyanotic, no noted pedal edema

Emergency medical care of all respiratory distress patients include airway management, supplemental oxygen, and ventilatory support.

Conditions which produce respiratory distress without bronchoconstriction that do **not** respond to bronchodilators are usually not associated with wheezing as a physical finding.

- a. CHF
- b. Pulmonary Edema

4. Signs & Symptoms of Congestive Heart Failure

- Respiratory Distress (Profound)
- Accessory Muscle Use
- JVD
- Diaphoresis
- Cyanosis
- Anxiety
- Fatigue
- Pulmonary Edema due to Heart Failure (Cardiogenic Pulmonary Edema)
- Rales or Ronchi
- Productive cough (frothy sputum, may be pink in color)
- Chest Pain
- Tachycardia

Conditions that produce bronchoconstriction are generally associated with wheezing and may respond to short-acting bronchodilators.

- a. COPD
- b. Asthma
- c. Allergic Reaction
- d. Respiratory Infections (pneumonia, acute bronchitis)

5. Signs & Symptoms of Chronic Obstructive Pulmonary Disease (COPD)

- Respiratory Distress
- Accessory Muscle Use
- Tripoding
- Pursed-lip breathing
- Cyanosis
- Inability to speak in complete sentences
- Audible Wheezing
- Restlessness
- Irritability
- Tachycardia



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6. Signs & Symptoms of Asthma

- Respiratory Distress
- Accessory Muscle Use
- Cyanosis
- Inability to speak in complete sentences
- Audible Wheezing (without stethoscope)
- Difficulty Exhaling
- Fatigue

An exaggerated immune system response to any substance (allergic reaction) may also cause an asthma attack. Severe reactions must be recognized and treated as such. The PA Statewide BLS Protocol 411-1 for Allergic Reaction/Anaphylaxis should be followed in cases of severe anaphylaxis.

7. Pneumonia

- Respiratory Distress (may be mild)
- Upper Respiratory Symptoms
- Wheezing (possible)
- Productive Cough (yellowish sputum)
- Chest Pain
- Fever
- Fatigue

Inclusion Criteria

Any patient in respiratory distress with signs and symptoms consistent with asthma, COPD, pulmonary edema, CHF, or pneumonia **and** who is:

1. Awake and able to follow commands
2. Is over 14 years old and is able to fit the CPAP mask
3. Has the ability to maintain an open airway
4. **And** exhibits two or more of the following
 - a. A respiratory rate greater than 25 breaths per minute
 - b. SPO2 of less than 90% at any time
 - c. Use of accessory muscles during respirations

Exclusion Criteria

1. Patient is in respiratory/cardiac arrest/apneic
2. Patient is suspected of having a pneumothorax or has suffered trauma to the chest
3. Patient has a tracheostomy
4. Patient is actively vomiting or has upper GI bleeding
5. Recent facial or cranial surgery
6. Recent esophageal surgery or esophageal varices
7. Stomach stapling



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CPAP Procedure

1. Request ALS intercept if not enroute and if available
2. **EXPLAIN THE PROCEDURE TO THE PATIENT**
3. Ensure adequate oxygen supply to ventilation device
4. Place the patient on continuous pulse oximetry
5. Place the delivery device over the mouth and nose
6. Secure the mask with provided straps or other provided devices
7. Use 10 cm H₂O of PEEP valve
8. Check for air leaks
9. Adjust flow rate and FI_O₂ to maintain adequate SpO₂ (95%) and to conserve O₂
10. Monitor and document vital signs every 5 minutes
11. Continue to coach patient to keep mask in place and readjust as needed
12. Removal of CPAP Device (Oxygen Considerations, patient condition, etc.)
13. Documentation (Completion of Data form, PA DOH Patient Care Report)