CONTINUOUS POSITIVE AIRWAY PRESSURE

Effective Date: February 7, 2014
Replaces: February 8, 2013
Review: November 2016

I. Purpose

The purpose of Policy 700-M12: Continuous Positive Airway Pressure (CPAP) is to describe the process of initiating and managing CPAP to patients and what equipment is required to do so.

II. Definition

Prehospital CPAP treatment in patients with acute pulmonary edema can improve oxygenation significantly and lower respiratory rate, heart rate, and systolic blood pressure. Continuous positive airway pressure (CPAP) may reduce the need for intubation and mechanical ventilation in patients with acute hypoxemic respiratory insufficiency. Noninvasive ventilation (NIV) has been associated with lower rates of endotracheal intubation in populations of patients with acute respiratory failure.

III. Indications

A. For patients in severe respiratory distress that meet the following criteria:

1. The patient is 8 years old or greater
2. There is a medical history of CHF with pulmonary edema with one or more of the following present:
   a. Pedal edema
   b. Orthopnea
   c. Anxiety
   d. Diaphoresis
   e. Currently taking Digoxin or Lasix
   f. There is a severe and sudden onset of SOB.
3. Severe asthma attack (use cautiously)\(^1\)
4. COPD exacerbation (use cautiously)
5. Near Drowning
6. Severe Respiratory Distress

IV. Contraindications

**Absolute Contraindications: (DO NOT USE)**

A. Age < 8 years old
B. Respiratory or cardiac arrest
C. Agonal respiration
D. Severely depressed level of consciousness
E. Systolic BP < 90 mmHg
F. Signs and symptoms of pneumothorax
G. Inability to maintain airway patency
H. Major trauma, especially head injury with increased ICP or significant chest trauma
I. Facial anomalies or trauma (e.g. burns, fractures)
J. Vomiting

**Relative contraindications (USE CAUTIOUSLY)**

A. History of pulmonary fibrosis
B. Decreased LOC
C. Claustrophobia or unable to tolerate mask (after first 1-2 minutes trial)

V. Equipment

A. County approved CPAP delivery system

VI. Procedure

A. Place patient in a seated position with legs dependent
B. Monitor ECG, VS (BP, HR, RR, SpO2)
C. Apply the county approved CPAP mask/device to the patient.
D. Provide patient reassurance that this will alleviate breathing problems,
E. NTG spray can be given through the open port, or simply remove the mask long enough to spray.

VII. Complications

A. Hypotension

\(^1\) Although Asthma and COPD patients are listed as a relative contraindication, there is benefit to CPAP's use. Providers should still take caution with elderly COPD patients due to the possibility of developing a pneumothorax.
B. Pneumothorax
C. Corneal drying

VIII. Goals of CPAP

A. Normally the patient should improve in the first five minutes of CPAP. Signs of improvement include:

1. Elimination of dyspnea
2. Decreased respiratory rate
3. Decreased heart rate
4. Increased SpO2
5. Stabilized BP

B. Should the patient fail to improve with CPAP, remove the CPAP device and assist ventilations with BVM or intubate patient.

Signs and symptoms of failure to improve include the following:

1. Sustained or increased heart rate
2. Sustained or increased respiratory rate
3. Sustained or increased BP
4. Sustained or decreasing pulse oximetry readings, and/or
5. Decreased level of consciousness.

IX. Documentation

A. The use of CPAP must be documented on the PCR
B. V/S (BP, HR, RR and SpO2) must be documented every 5 minutes.
C. In the narrative section of the PCR, document the patient’s response to CPAP.
D. Any adverse event related to the use of CPAP.
E. Indicate that CPAP is being used when giving the ring down report so the ED can be ready to maintain the procedure on arrival to ED.
CONTINUOUS POSITIVE AIRWAY PRESSURE

Effective: February 8, 2013
Replaces: New June 2012
Review: November 2014

Introduction:
Prehospital CPAP treatment in patients with Acute Pulmonary Edema can improve oxygenation significantly and lower respiratory rate, heart rate, and systolic blood pressure. Continuous positive airway pressure (CPAP) may reduce the need for intubation and mechanical ventilation in patients with acute hypoxemic respiratory insufficiency. Noninvasive ventilation (NIV) has been associated with lower rates of endotracheal intubation in populations of patients with acute respiratory failure.

Indications
• Age > 8 years old
• History of CHF with Pulmonary Edema and one or more of the following:
  ➢ Pedal Edema ➢ Taking Digoxin or Lasix
  ➢ Orthopnea ➢ Severe or sudden onset SOB
  ➢ Anxious ➢ Rales or coarse wheezes
  ➢ Diaphoresis ➢ Hypertension
OR
  ➢ Severe Asthma Attack
  ➢ COPD Exacerbation
• Near Drowning
• Severe respiratory distress

Contraindications:
• Absolute Contraindications: (DO NOT USE)
  ➢ Age < 8 years old
  ➢ Respiratory or cardiac arrest
  ➢ Agonal respiration
  ➢ Severely depressed level of consciousness
  ➢ Systolic BP < 90 mmHg
  ➢ Signs and symptoms of pneumothorax
  ➢ Inability to maintain airway patency
- Major trauma, especially head injury with increased ICP or significant chest trauma
- Facial anomalies or trauma (e.g. burns, fractures)
- Vomiting

• Relative contraindications (USE CAUTIOUSLY)

- History of asthma and/or COPD
- History of pulmonary fibrosis
- Decreased LOC
- Claustrophobia or unable to tolerate mask (after first 1-2 minutes trial)

**Equipment**

A. County approved CPAP delivery system.
   Boussignac CPAP system
   Oxygen tank with flow rate regulator that can achieve 25 L/min (25 LPM flow will achieve CPAP of 8-10 cm H2O)

**Procedure:**

- Place patient in a seated position with legs dependent
- Monitor ECG, VS (BP, HR, RR, SpO2)
- C. Apply the county approved CPAP mask/device to the patient. Attach hose to an O2 tank capable of 25 LPM flow rate and place mask on patient.
- A liter flow of 25 LPM will provide approximately 8-10 cms of water pressure
- Provide patient reassurance that this will alleviate breathing problems,
- NTG spray can be given through the open port, or simply remove the mask long enough to spray,

**Complications:**

- Hypotension
- Pneumothorax
- Corneal drying

**Goals of CPAP**

Normally the patient should improve in the first five minutes of CPAP

Signs of improvement include:

- Elimination of dyspnea
- Decreased respiratory rate
- Decreased heart rate
• Increased SpO2
• Stabilized BP

**Failure to improve:**
Should the patient fail to improve with CPAP, remove the CPAP device and assist ventilations with BVM or intubate patient.

Signs and symptoms of failure to improve include the following:
• Sustained or increased heart rate
• Sustained or increased respiratory rate
• Sustained or increased BP
• Sustained or decreasing pulse oximetry readings, and/or
• Decreased level of consciousness.

**Documentation:**
• The use of CPAP must be documented on the PCR
• VS (BP, HR, RR and SpO2) must be documented every 5 minutes
• In the narrative section of the PCR, document the patient’s response to CPAP.
• Any adverse event related to the use of CPAP.
• Indicate that CPAP is being used when giving the ring down report so the ED can be ready to maintain the procedure on arrival to ED.