
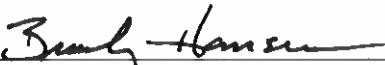




Jackson Hole Fire/EMS Operations Manual

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Title: **Continuous Positive
Airway Pressure (CPAP)**
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Continuous Positive Airway Pressure (CPAP) (Procedure guideline)

AEMT, EMT-I, PARAMEDIC

NO VOICE ORDER REQUIRED

INDICATIONS:

Patient complains of shortness of breath and is/has:

- 1) Signs and symptoms consistent with
 - pulmonary edema
 - CHF
 - asthma
 - COPD
 - pneumonia
 - other causes of respiratory distress of medical origin
- 2) Awake, oriented, and able and willing to follow commands
- 3) Over 12 years old and is able to fit the CPAP mask
- 4) Able to maintain an open airway (GCS >10)
- 5) A systolic blood pressure of 90 mmHg
- 6) **AND** two or more of the following:
 - Respiratory rate greater than 25 breaths per minute
 - Pulse oximetry less than 90%
 - Retractions or accessory muscle use during respirations
 - Lung exam reveals wheezing, rales, or diminished breath sounds depending on etiology of respiratory distress

PURPOSE:

- “Splint” airways with constant pressure of air to reduce the work of breathing
- Force excess fluid out of the alveoli and interstitial space back into the vasculature.
- Splinting the constricted airways open allows for more effective air exchange
- Provide palliative intervention with noninvasive airway support for patients with DNR orders

CONTRANDICATIONS:

- Respiratory arrest
- Hemodynamic instability (i.e. SBP < 90 mm/Hg)
- History of significant chest trauma or suspected pneumothorax
- Patient has a tracheostomy

- Facial fractures and/or lacerations or anatomical incompatibility
- High risk of aspiration i.e.: actively vomiting, foreign body airway occlusion

PRECAUTIONS:

- Impaired mental status may hinder patients ability to assist with his or her medical care and cooperate with the procedure
- Complains of nausea
- Has excessive secretions
- Inadequate respiratory effort
- Known history of recent gastric surgery (less than 2 weeks)
- Watch patient for gastric distention, which can lead to vomiting
- Be prepared for intubation in the event the patient deteriorates or is unable to tolerate CPAP

TECHNIQUE: USE APPROPRIATE BSI PRECAUTIONS

- EXPLAIN THE PROCEDURE TO THE PATIENT
- Ensure adequate oxygen supply to ventilation device
- Attach CPAP mask's tubing to *standard Oxygen flowmeter* capable of 25 LPM flow rates.
- Assemble required equipment and personnel for intubation in the event the patient deteriorates or is unable to tolerate CPAP
- Place patient on continuous pulse oximetry and cardiac monitoring
- Adjust oxygen source initially to 10-12 LPM
 - To increase PEEP, slowly adjust O₂ rate to increase PEEP until patient exhibits improvement in respiratory effort, improved mental status, and SpO₂ > 92%.
 - Monitor CPAP manometer
 - NEVER EXCEED PEEP PRESSURE of 12 cm/H₂O
 - Below are suggested oxygen flow rates and corresponding pressures (in cm/ H₂O). Use device manometer to titrate pressure to match patient needs.

Standard	
FLOW (LPM)	CPAP/PEEP (cm H ₂ O)
8-9	5.0
10-12	7.5
13-14	10.0
>14	13.0 (MAX)

Nebulizer Attachment		
FLOW (LPM)	CPAP/PEEP (cm H ₂ O) nebulizer off	CPAP/PEEP (cm H ₂ O) nebulizer on
6	2.0 - 3.0	1.0-2.0
10	6.0 – 7.0	2.0-3.0
12	8.0 – 9.0	3.0-4.0
14-15	11.0 – 12.0	4.0-5.0

Pressure relief limits maximum CPAP pressure to 25 cm H₂O @ 25 LPM. **Manometer** accuracy ± 3 cm H₂O up to 15 cm H₂O and ± 5 cm H₂O over 15 cm H₂O

- Place the mask over mouth and nose and instruct patient to hold mask until comfortable
- Secure the mask with straps and check for air leakage
- Monitor and document the patient's respiratory response to treatment, including full vital set

- If patient's status deteriorates, discontinue CPAP and assess the patient for positive pressure ventilations (BVM) and the need to intubate
- Continue to coach patient to keep mask in place and readjust as needed
- Notify destination hospital that CPAP has been used
- If patient is experiencing increasing anxiety, *consider analgesia and sedation*. Contact medical control for direction.

REMOVAL PROCEDURE:

- CPAP therapy needs to be continuous and should not be removed unless the patient cannot tolerate the mask, begins to vomit or experiences continued or worsening respiratory failure
- Intermittent positive pressure ventilation with a BVM and/or intubation should be considered if patient is removed from CPAP therapy

SPECIAL CONSIDERATIONS:

- Most patients will improve in 5-10 minutes.
- If no improvement within this time, consider intermittent positive pressure ventilation
- Due to changes in preload and afterload of the heart during CPAP therapy, a complete set of vital signs needs to be obtained every 5 minutes
- Depending on patient's underlying problem (CHF, COPD, etc) follow appropriate protocol