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 O_2 rate to increase PEEP until patient exhibits improvement in respiratory effort, improved mental status, and $SpO_2 > 92\%$.
    - Monitor CPAP manometer
    - NEVER EXCEED PEEP PRESSURE of 12 cm/H_2O
    - Below are suggested oxygen flow rates and corresponding pressures (in cm/ H_2O). Use device manometer to titrate pressure to match patient needs.

Standard

FLOW (LPM)	CPAP/PEEP (cm H_2O)
8-9	5.0
10-12	7.5
13-14	10.0
>14	13.0 (MAX)

Nebulizer Attachment

FLOW (LPM)	CPAP/PEEP (cm H_2O) nebulizer off	CPAP/PEEP (cm H_2O) 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 H_2O @ 25 LPM. **Manometer** accuracy ± 3 cm H_2O up to 15 cm H_2O and ± 5 cm H_2O over 15 cm H_2O

- 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