County of Santa Cruz

HEALTH SERVICES AGENCY

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EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5800
Reviewed February 2008

Emergency Medical Services Program

Approved

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Medical Director

Subject: CONTINUOUS POSITIVE AIRWAY PRESSURE (CPAP)

I. Purpose:
Patients with respiratory compromise from pulmonary edema, chronic obstructive pulmonary disease, asthma or other pulmonary diseases suffer an increased work of breathing and ineffective gas exchange at the alveolar level.

CPAP works by increasing flow restriction during exhalation. This "splints" open patients' airways, reducing the work of breathing and increasing gas exchange at the alveolar level. In CHF patients, CPAP also serves to force excess fluid out of the alveoli and interstitial space and back into the vascular space, and reduces venous return and subsequent cardiac workload.

II. Indications
A. CPAP may be utilized in conscious, breathing patients with severe respiratory distress secondary to:
- Acute pulmonary edema
- Bronchial constriction caused by chronic obstructive pulmonary disease, asthma, or other etiologies.
- Other causes not listed above.

B. CPAP is authorized for use **only** in patients that are 8 years or older.

III. Contraindications

A. Absolute

CPAP will **not** be used when the following conditions are present:
- Respiratory or cardiac arrest
- Agonal respirations
- Severely depressed level of consciousness
- Hypotension
- Signs or symptoms of a pneumothorax
- Inability to maintain airway patency
- Major trauma
- Trauma to the head with increased intracranial pressure
- Trauma to the face such as burns or fractures
- Vomiting

B. Relative:

Use CPAP **cautiously** in patients with:

- Pulmonary Fibrosis
- Any decreased level of consciousness
- Claustrophobia (after first 1 – 2 minute trial)

IV. Complications

A. Hypotension
B. Pneumothorax
C. Corneal Drying

V. Goals

A. Decreased work of breathing.
B. Decreased respiratory and heart rate.
C. Increased Sp02
D. Stabilized blood pressure
E. Improved patient comfort and decreased anxiety associated with shortness of breath.

VI. Procedure

A. Explain procedure to patient. Stress that this mask will work better if the patient tries to breathe normally after it is applied.
B. Size the patient for a small, medium or large anesthesia mask.
C. Attach the Boussignac CPAP mask to the 02 source. Turn the 02 regulator on to 10 lpm.
D. Attach the Boussignac CPAP mask to the patient using the elastic mask holder. Obtain a tight fit.
E. Attach a manometer to the manometer port on the mask.
F. Slowly increase 02 delivery until the manometer reads 7.5 – 8.0 cm H20
G. If indicated, attach a nebulizer to the CPAP mask, using a supplemental 02 source set at 6 lpm.
H. Monitor all vital signs, including BP, pulse, respiratory rate, work of breathing, Sp02, patient's overall level of distress.
I. While on CPAP, a patient should be continuously monitored for signs of improvement, as well as for signs of respiratory failure, vomiting, pneumothorax, or hypotension.
J. Maintain CPAP once it has been initiated with good therapeutic effect. Do not discontinue CPAP at the hospital unless directed to by the receiving ED physician.

VII. Training/QA

A. In order to perform this skill a paramedic must complete a County-approved CPAP class and annual mandatory skills evaluation. No paramedic may utilize this skill without course completion and approval by respective provider QI managers and the County Medical Director.
B. All CPAP cases will be subject to audit as deemed appropriate by the County EMS Quality Improvement Committee.

VIII. Notes

- Use of positive pressure ventilation with BVM, ETI, or King Tube should be considered if the patient shows signs of respiratory failure

- This procedure is very 02 intensive. At 20 lpm, a full D tank will be drained in 14 – 16 minutes.

- Monitor the manometer to insure that the correct cm of H20 is being maintained. It is likely that the cm H20 may decrease as the D tank is emptied to below 500 -600 psi.

- Document patient vital signs and status changes on the PCR. In particular, note changes in Sp02, work of breathing, respiratory rate, and patient comfort.

- Watch for hypotension in particular. CPAP decreases venous return and can drop BP relatively quickly.