Flow-Safe II
(CPAP)

Escambia County, Florida - ALS/BLS Medical Protocol

Continuous Positive Airway Pressure has been shown to rapidly improve vital signs, gas exchange, the work of breathing, decrease the sense of dyspnea, and decrease the need for endotracheal intubation in the patients who suffer from shortness of breath from congestive heart failure and acute cardiogenic pulmonary edema. In patients with CHF, CPAP improves hemodynamics by reducing preload and after load. CPAP is also shown to improve dyspnea associated with pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema).

Indications

Dyspnea / Hypoxemia secondary to congestive heart failure, acute cardiogenic pulmonary edema, pneumonia, chronic obstructive pulmonary disease (asthma, bronchitis, emphysema) and:

A. Any patient who is complaining of shortness of breath for reasons other than pneumothorax.

B. Is awake and oriented.

C. Has the ability to maintain an open airway.

D. Has a respiratory rate greater than 25 breaths per minute.

E. Has a systolic blood pressure above 90 mmHg.

F. Uses accessory muscles during respirations.

Contraindications

1. Pneumothorax
2. Respiratory arrest
3. Agonal respirations
4. Unconscious or unable to follow commands
5. Shock associated with cardiac insufficiency.
6. Penetrating chest trauma.
7. Persistent nausea/vomiting.
8. Facial anomalies / stroke obtundation / facial trauma /burns.
9. Has active upper GI bleeding or history of recent gastric surgery.
10. Less than 12 years old.

Procedure

1. Explain the procedure to the patient.
2. Continuously monitor patient.
   a. Check and document vital signs every five (5) minutes.
   b. Observe for decrease in level of consciousness.

c. Observe for gastric distention.

3. Continuously monitor pulse oximeter.

4. Ensure adequate oxygen supply to the CPAP device.

5. Turn CPAP device on

6. Have the patient sit up as much as possible.

7. Apply the device as per manufacturer's directions.

8. Initially assist the patient in holding the mask tightly to their face and evaluate their tolerance of the mask.

9. Reevaluate patient's condition and tolerance of the mask:

   a. Coach the patient to keep mask in place and readjust as needed.

   b. If respiratory status or level of consciousness deteriorates, then remove device, assist respirations, and utilize appropriate airway management modality as per protocol.

   c. If patient tolerates mask and condition does not deteriorate then secure the mask with straps.

10. Check for air leaks.

11. Continue to monitor the patient during transport.

12. Contact Medical Control as early as possible so the receiving hospital can be prepared for the patient.

13. Documentation on the patient care record should include:

    a. CPAP level (10cmH2O)

    b. F_iO_2 (100%)

c. SpO2 q5 minutes

d. Vital Sign q5 minutes

e. Response to treatment

f. Any adverse reactions

Procedure (Albuterol Nebulizer Use)

(A) Use of Albuterol with the Nebulizer/Acorn is allowed.

(B) All other elements of the procedures should be followed with this application of the CPAP system. With the acorn in use the initial setting should be 2.5-3.0cmH2O giving approximately 30% more medication delivered.

(c) To utilize the nebulizer it requires placing the T-piece from a nebulizer setup inline with the mask and the valve as shown on the previous page.

The acorn does require an O2 source connection in order not to "percolate" the Albuterol out of the oxygen connection port. Medication efficacy or delivery is supposed to be improved approximately 30% with this delivery method verses the normal configuration.

Special Notes

1. CPAP should not be used in children under 12 years of age.

2. Advise receiving hospital as soon as possible so they can prepare for the patient's

arrival.

3. Do not remove CPAP until hospital therapy is ready to be placed on the patient.

4. Monitor patient for gastric distension which may lead to vomiting.

5. Use nitroglycerine tablets to avoid nitroglycerine spray from being dispersed on patient/EMS crew.

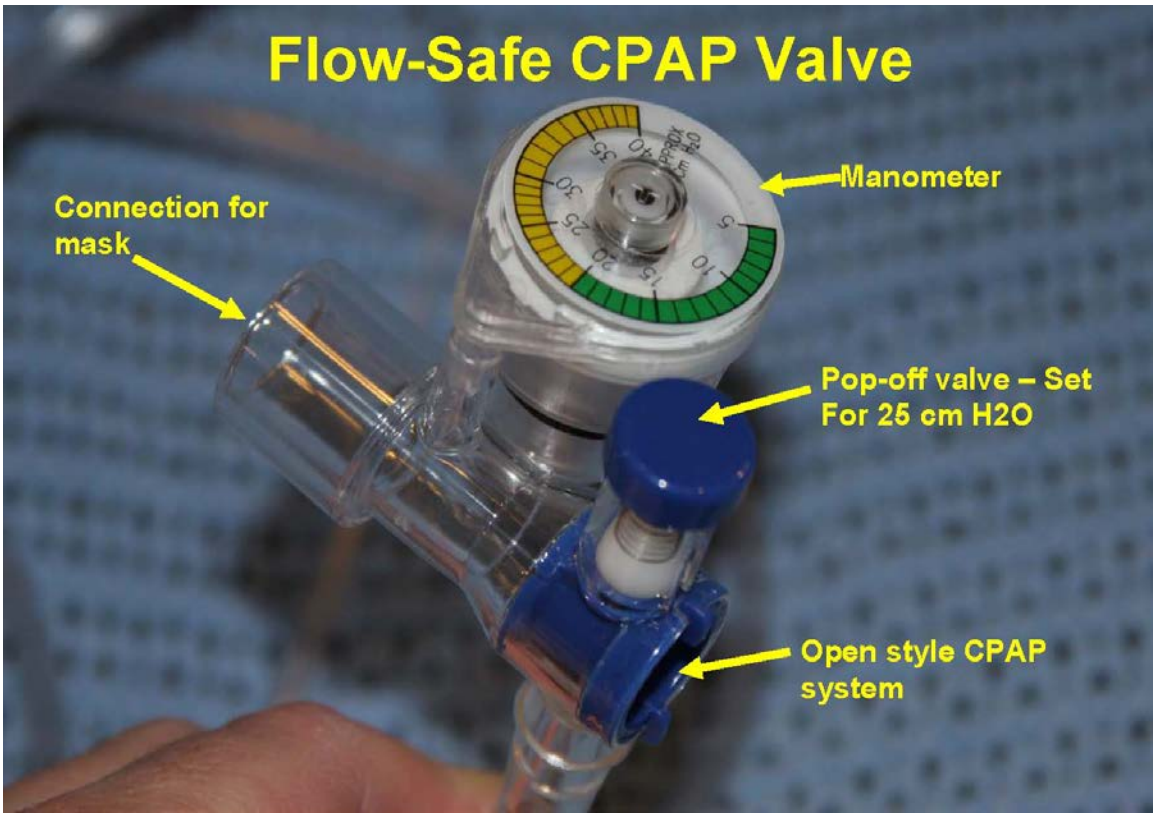
6. CPAP may be considered for non-cardiogenic pulmonary edema use as well, i.e. drowning and near drowning.

7. This procedure may be performed on a patient with a Do Not Resuscitate order.

8. CPAP pressure should be started at 3-5 cm of H20. Most patients will only require 5 cm H20. Pressure may be slowly titrated upward depending on patient response, BUT NEVER ABOVE 10 cm H2O.

9. Do not force CPAP use on patients who have failed at past attempts to utilize noninvasive ventilation techniques, and request that it not be applied.

Lightweight and Portable	75 grams nominal (less mask and harness) 61 mm X 60 mm X 50 mm (unit only)
Flow (LPM)	CPAP/PEEP (cm H_2O)
10	1.5 - 2.0
15	3.0 - 4.0
20	6.0 - 7.0
25	8.5 - 10



Flow vs Pressure

Lightweight & Portable Flow (LPM)	80 grams nominal (less mask & harness) 90mm x 53mm x 65mm (unit only) CPAP/PEEP (approx. cm H2O))
6	2.0 - 3.0
10	6.0 - 7.0
12	8.0 - 9.0
15	11.0 - 12.0
8-9	5.0
10-12	7.5
13-14	10.0
Flush	13.0 (Max.)

MINUTES OF OXYGEN BY CYLINDER SIZE USING DIFFERENT FLOW RATES (BASED ON A FULL CYLINDER WITH 2200 PSI)

	Cylinder		
FLOW	***"D"***	***"E"***	***"M"***
5	***70***	***123***	***703***
6	***58***	***102***	***598***
8	***44***	***77***	***498***
10	***35***	***61***	***374***
12	***29***	***51***	***299***
15	***23***	***41***	***199***
20	***16***	***29***	***175***

******WARNING******

USE OF ANY CPAP DEVICE REQUIRES CONSIDERABLE AMOUNTS OF OXYGEN. (Understand that the device uses 100psi per minute of a D cylinder at 15LPM. Be mindful of how much oxygen you have available.)

PATIENTS IN SEVERE DISTRESS CANNOT TOLERATE A LAPSE IN CPAP OR OXYGEN DELIVERY WHILE CHANGING OXYGEN CLYNDERS.