RIVERSIDE COUNTY

EMS

EMERGENCY MEDICAL SERVICES AGENCY

TO: EMS System Participants

FROM: Humberto Ochoa, Medical Director HMO

RE: New policies for CHF/CPAP

DATE: Monday, November 22, 2010

Attached are these final policies:

- 7850 – DYSPNEA – SUSPECTED CONGESTIVE HEART FAILURE (revised treatment protocol)
- CPAP – Performance Standard (new performance standard)

These two policies take effect beginning November 23, 2010.

The full implementation of the revised Treatment Protocol 7850 and the Performance Standard for CPAP will require that you obtain supplies, and complete training. Paramedic providers must notify the EMS Agency when they are prepared to implement these policies so that the EMS Agency can alert other system participants to your progress.

All paramedic providers must complete implementation of these two policies by April 1, 2011.

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RIVERSIDE COUNTY EMS EMERGENCY MEDICAL SERVICES AGENCY

Performance Standard	CPAP

Effective	Expires
November 23, 2010	March 31, 2012

Performance Standard: **Continuous Positive Airway Pressure**	Approval: REMSA Medical Director **Humberto Ochoa MD**	Signature H Ochoa M.D.
Applies To: **PM**	Approval: REMSA Director **Bruce Barton, CCEMT-P**	Signature

Terminal Performance Objective

Decreased venous return, increased alveolar recruitment, and decreased pulmonary edema resulting in the restoration of adequate cardiac output, gas exchange, and tissue perfusion.

Before applying continuous positive airway pressure (CPAP) paramedics must:

1. Assess the patient's ABC's
2. Determine the patient is a candidate for CPAP:
    a. Confirm the patient is experiencing dyspnea with pertinent findings suggestive of CHF
    b. Confirm that patient is awake, alert and able to maintain their own airway
    c. Confirm that assisted ventilation and/or ETI is not indicated
    d. Recognize contraindications to CPAP:
        i. Apneic
        ii. Unconscious
        iii. Pediatric (14 years old or less *and* 80 pounds or less *and* length of Broselow Tape or less)
        iv. Suspected Pneumothorax
        v. Vomiting
        vi. Pump failure due to severe bradycardia or non-compensatory tachycardia (treat rate first)
        vii. Systolic blood pressure of 90 mmHg or less
3. Place the patient sitting upright with lower extremities dependent to encourage pulmonary function and venous pooling
4. Provide supplemental oxygen as clinically indicated
5. Provide clinically indicated treatment following the applicable treatment protocol
6. Continue clinically indicated treatment, including pharmacologic interventions, while preparing equipment
7. Explain to the patient what they can expect to experience, while avoiding delays in treatment

While applying continuous positive airway pressure (CPAP) paramedics must:

1. Prepare for application of the Pulmodyne™ O2-RESQ™ system
    a. Select and prepare the appropriate size mask
    b. Set pressure to 5 cmH_2O CPAP
    c. Prepare the head strap and circuit
    d. Attach the system to an oxygen supply
    e. Ensure the availability of suction, airway, and assisted ventilation supplies
    f. Prepare to slowly increase and titrate pressure in 2.5 cmH_2O increments as clinically indicated
2. Apply the oxygen charged Pulmodyne™ O2-RESQ™ system to the patient without securing the head strap
3. Coach the patient to:
    a. Hold the mask firmly to their own face
    b. Inhale through nose and exhale through mouth
    c. Continue to breathe evenly against the increasing pressure
4. Troubleshoot for leaks and adjust the mask to maintain a complete seal while applying the head strap
5. Confirm the integrity of the circuit, mask seal, and oxygen delivery to the patient
6. Immediately reassess the patient:
    a. Pulmonary assessment including: lung sounds, respiratory rate, and work of breathing
    b. Cardiovascular assessment including: blood pressure and heart rate
7. Consider the need to medicate for anxiety associated with CPAP

8. Slowly and sequentially increase CPAP in 2.5 cmH_2O increments, up to 15 cmH_2O maximum CPAP, as clinically indicated by the patient's response to therapy (see "Critical Success Targets for CPAP" below)
9. Immediately re-assess the patient following each change in pressure
    a. Pulmonary assessment including: lung sounds, respiratory rate, and work of breathing
    b. Cardiovascular assessment including: blood pressure and heart rate
10. Titrate CPAP in 2.5 cmH_2O increments to relief of dyspnea while continuously assessing patient's tolerance of CPAP
11. Provide clinically indicated treatment following the applicable REMSA Treatment Protocol(s)
12. Consult online medical direction if exceeding 15 cmH_2O CPAP is clinically indicated

Critical Success Targets for CPAP

1. Improvement in patient's perceived work of breathing
2. Resolution of, or improvement in, patient's dyspnea
3. Improved signs of perfusion
4. SPO2 greater than 94%

System Benchmark

Percentage of patients receiving CPAP with relief of, or improvement in, dyspnea

Applicable Protocols

7850 – DYSPNEA – SUSPECTED CONGESTIVE HEART FAILURE (CHF)

Core Competency Requirements to be Covered during Education and Training on CPAP

1. Pulmonological and Cardiovascular Anatomy & Physiology
2. Pulmonology and Cardiology – Pathophysiology of congestive heart failure
3. Assessment of respiration and recognition of respiratory instability
4. Assessment of circulation and recognition of hemodynamic instability
5. Identification of need for CPAP and contraindications to its application
6. Proper application of device on patient
7. Patient communication techniques
8. Concurrent medication for anxiety associated with CPAP
9. Demonstrates proper technique for use of the Pulmodyne™ O2-RESQ™ system
10. Post application recognition of deterioration and appropriate alternative treatment
11. Reassessment of patient

Adjunctive Performance Standards

Currently, no adjunctive performance standards have been created.

Equipment Requirements

1. PPE
2. Model patient
3. Stethoscope
4. Blood pressure cuff
5. Oxygen equipment (tank, regulator with DISS, nasal cannula, non-rebreather mask, Pulmodyne™ O2-RESQ™ system)
6. Versed
7. Medication equipment (IV access, IM equipment)
8. Intubation equipment (BVM, suction, laryngoscope with selection of blades, ET tubes, etc.)

Instructor Resource Materials

1. Pulmodyne™ O2-RESQ™ training materials
2. Applicable REMSA Treatment Protocols
3. NHTSA EMS Educational Instructor Guidelines for EMT and Paramedic

RIVERSIDE COUNTY EMS
EMERGENCY MEDICAL SERVICES AGENCY

Treatment Protocol	7850

Effective	Expires
November 23, 2010	March 31, 2012

Treatment Protocol: **Dyspnea – Suspected CHF**	Approval: REMSA Medical Director **Humberto Ochoa MD**	Signature H Ochoa M.D.
Applies To: **PM**	Approval: REMSA Director **Bruce Barton, CCEMT-P**	Signature

Pertinent Findings

History may include: Coronary artery disease, prescribed NTG, history of CHF, orthopnea, fluid retention and/or recent weight gain, paroxysmal nocturnal dyspnea (PND)

Medications may include: Oxygen, Vasodilators, Diuretics, ACE Inhibitors, Digitalis

Physical findings may include: Tachypnea, anxiety and dyspnea, tripoding and accessory muscle use, peripheral and sacral edema, cough, increased clear/pink sputum, pallor, mottling, cyanosis, fine or coarse crackles, wheezes, diminished breath sounds, chest pain or discomfort, elevated diastolic blood pressure

Differential diagnosis may include: MI, COPD, new onset CHF, pulmonary embolism, and pneumonia

PRIOR TO CONTACT ORDERS

These orders are to be completed as clinically indicated and, while presented sequentially, may be completed simultaneously.

1. OXYGEN
   Give oxygen as clinically indicated.

2. POSITION
   Sit upright with lower extremities dependent.

3. MONITOR
   Treat rhythm as appropriate. Perform and interpret 12 Lead ECG.

4. VENOUS ACCESS
   Initiate venous access as clinically indicated. (Do not delay administration of Nitroglycerin.)

5. NITROGLYCERIN
   0.4 mg sublingual (SL) spray or tablet
   Repeat every 3 to 5 minutes up to 1.2 mg total
   As clinically indicated for dyspnea with suspected congestive heart failure
   While systolic BP remains greater than 90 mmHg prior to each administration
   Administration of Nitroglycerin following the patient's use of a PDE5 inhibitor requires online medical direction (OMD)

6. NITROGLYCERIN PASTE
   1 inch transdermal 2% ointment
   For dyspnea with suspected acute congestive heart failure
   While systolic BP remains greater than 90 mmHg
   Remove and wipe away excess if systolic BP falls below 90 mmHg
   Administration of Nitroglycerin following the patient's use of a PDE5 inhibitor requires online medical direction (OMD)

7. CPAP
    For dyspnea with suspected congestive heart failure
    Begin at 5 cmH_2O
    Slowly increase pressure in 2.5 cmH_2O increments
    Titrate to relief of dyspnea while continuously assessing patient's tolerance of CPAP
    Up to 15 cmH_2O maximum
    While systolic BP remains greater than 90 mmHg
    Contact OMD for direction if systolic BP falls below 90 mmHg
    Pediatric application is contraindicated

8. VERSED
    1 mg slow IV push or IM
    For relief of anxiety related to CPAP
    While systolic BP remains greater than 90 mmHg prior to administration
    Any additional dose requires online medical direction (OMD)

***** ***** BASE HOSPITAL PHYSICIAN ORDERS ***** *****

1. CPAP
    As ordered
    For dyspnea with suspected congestive heart failure
    Up to 20 cmH_2O maximum

2. VERSED
    As ordered
    For relief of anxiety related to CPAP

PUBLIC COMMENTS to Proposed New Policy: CPAP-Performance Standard

Section Referenced	Comment	Agency Response
1, vi	**Suggest slight reword to: "Pump failure due to severe non-compensatory tachycardia (treat rate problem first)"** (this clarification is to help exclude the normal tachycardia that is compensatory, <150bpm, which accompanies any mod-severe case of CHF) from the pathologic tachycardias that may in themselves cause CHF (e.g. severe a-fib/flutter, WPW, Vtachs, etc.)	Changed.
While applying continuous positive airway pressure (CPAP) paramedics must: # 3 c	Change **breath** (noun) to **breathe** (verb) :-)	Changed.
While applying continuous positive airway pressure (CPAP) paramedics must: #12	I may be missing something subtle (or obvious!) but would this be better described as **"Request"** since this is an action the savvy medic would make? Unless I'm missing something, suggest reword to: **"Request a Base Hospital Physician Order to exceed 10 cmH_2O CPAP when clinically indicated"**	Noted, changed to: Consult online medical direction if exceeding 15 cmH_2O CPAP is clinically indicated
Core Competency Requirements to be covered during education/training on CPAP #1	Pulmonary would be clearer and consistent versus the mouthful of "pulmonological"; moreover pulmonological refers more to a knowledge of the lungs whereas pulmonary is more of an attribute or sourcing to the lungs. Sort of like making "cardiological" the adjective instead of "cardiac". The former is more a reference to the area of study whereas the cardiac is more indicative of relationship. Recommend Changing to: **"Pulmonary and Cardiovascular A&P"**	"Pulmonological" is correct in reference to the study of anatomy and physiology.
Core Competency Requirements to be covered during education/training on CPAP #2	Ditto: Pulmonology & Cardiology --> Pathophysiology (consistent relationship of terminology). Recommend changing to: **"Pulmonology and Cardiology—Pathophysiology of Congestive Heart Failure"** Yeah, I can't help myself :-) I believe these subtle changes create a medically professional and precise standard consistent with the meaning and intent of the words while avoiding	Changed.

	the vocabulary "drift" common in medicine and other technical fields…the accidental tendency to "cross-dress" words while missing the meaning.	

PUBLIC COMMENTS to Proposed New Policy: 7850-RESPIRATORY DISTRESS WITH SIGNS OF CONGESTIVE HEART FAILURE (CHF)

Section Referenced	Comment	Agency Response
Title	We have protocols for dealing with shortness of breath (or dyspnea), and the protocols change depending on the cause of the dyspnea. For the sake of consistency, would it be possible to standardize the wording? I like the word "Dyspnea" because it's all inclusive and acceptable medical terminology familiar to EMT-Basic and above. Second, in one word it replaces "Shortness of Breath" and allows space on a tight form. Dyspnea—Suspected Acute Pulmonary Edema [covers LEFT-sided CHF/MI-induced failure, toxicity induced edema] Most importantly, the complaint (Dyspnea) is now attributed to an identified pathophysiologic state without attributing it to an end-diagnosis. The differentiation doesn't trivialize or simplify treatment to where the medic dumbly responds one of two ways, while allowing the medic to make a provisional/presumptive diagnosis (much as an ER physician does until labs/x-rays/CT comes back) and treat the condition. I'm fine leaving out the "Suspected" because that's implied and space is limited Tony Ricci	Title changed to: Dyspnea with Suspected CHF. Orders include the wording: dyspnea with suspected acute pulmonary edema.
	Looks quite good! Recommended modification: make application of CPAP for BP <90mmHg an OMD option rather than excluding it. Dr. V's input on the actual results with hypotensive patients seems to indicate that the hypothetical BP drop hasn't borne out in actual fact. A rewrite might look like this (under CPAP PTC section, in place of "While Systolic BP remains greater than 90mmHg"): "Application of	Line added to prior to contact CPAP order: "Contact OMD for direction if systolic BP falls below 90 mmHg". Line regarding systolic BP removed from BHPO.

	CPAP for patients with systolic BP less than 90mmHg requires online medical direction (OMD)" Having the above modification allows a measure of flexibility for the Base Hospital in dealing with potentially unusual or transient situation (BP-wise) while maximizing protection for the patient from egregious application of CPAP technology. Tony Ricci	
Base Hospital Order Section 1	**BASE HOSPITAL PHYSICIAN ORDERS ***** ***** **1. CPAP For respiratory distress with signs of CHF** **Continue to increase pressure in 2.5 cmH_2O or 5 cmH_2O increments** **Up to 20 cmH_2O maximum** **Titrate to relief of respiratory distress while balancing patient tolerance** **While systolic BP remains greater than 90 mmHg** Base Hospital Order should be reworded to clearly indicate what range of pressure requires Base Physician Order. Current format has potential to be confusing. Also, based on Physician discussion at PMAC, ICEMA is using pressures above 10cmH20 with success prior to contact. Recommend mirroring ICEMA protocol up to 15cmH20. Contact required for pressures above 15cmH20 up to 20cmH20. Robert Fish	Line changed in prior to contact orders: "Up to 15 cmH2O maximum". Lines changed in BHPOs: "Up to 20 cmH2O maximum".
Page 1	Should read, "Differential *diagnosis* may include . . ." Laura Wallin	Added "diagnosis".