County of Santa Cruz

HEALTH SERVICES AGENCY

POST OFFICE BOX 962, 1080 EMELINE AVENUE SANTA CRUZ, CA 95061-0962
(831) 454-4120 FAX: (831) 454-4488 TDD: (831) 454-4123

EMERGENCY MEDICAL SERVICES PROGRAM

Policy No. 5000
April 15, 2014

Emergency Medical Services Program

Approved

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Medical Director

Subject: ADVANCED AIRWAY MANAGEMENT

The following procedures are to be used in the care of patients for whom airway management is indicated. The equipment and procedures listed are provided as a guideline for managing airways in patients. Also listed are documentation standards that are to be utilized when charting these procedures.

Endotracheal Intubation (ETI)

Authority for this policy is noted in the California Administrative Code, T22, Div 9, Section 100145 (a) 1 (C). This policy outlines the criteria for use of this selected procedure in Santa Cruz County.

I. Indications For Endotracheal Intubation

Placement of an oral endotracheal tube in the adult or pediatric patient is a STANDING ORDER for paramedics and may be done prior to the establishment of contact with the Base Hospital according to the following indications:

1. Cardiac Arrest
2. Respiratory Arrest
3. Severe respiratory failure with impending respiratory arrest
4. Unstable airway or impending airway obstruction

II. Use of Versed

Versed may be used as an adjunct to intubation in those patients who are in need of advanced airway management, but are unable to be managed due to combativeness, clenching, trismus, etc. In these cases, Versed is a STANDING ORDER and may be used without first contacting the Base Hospital. Nevertheless, in ALL CASES where Versed is used, early notification of the Base Hospital is advised. If unable to manage a patient's airway after initial dose of Versed, consider Base Hospital contact for subsequent doses. Maximum initial dose 5mg IVP/IO or 10mg IM. Pediatric dosing is 0.1mg/kg IVP/IO or 0.2mg/kg IM with a maximum initial dose of 3mg.

III. Notes

* No more than three (3) intubation attempts per patient.

* Intubation of cardiac arrest patients should be performed during continuous compression. For patients with pulses, no more than 15 seconds is allowed for an intubation attempt. If endotracheal intubation is unsuccessful after 15 seconds, ventilate before next attempt.

* If a patient should regain consciousness while intubated, extubate if such treatment is deemed medically safe and appropriate. Contact Base Hospital for chemical restraint if needed.

* NASOTRACHEAL intubation is NOT authorized and will not be performed.

* Placement of a c-spine immobilization collar is required on all patients who have been intubated.

IV. Definitions of Intubation Procedure

*** ATTEMPT:** An ETI attempt is when you place the tip of the endotracheal tube (ETT) past the plane of the patient's teeth. Until such time as the tip of the ETT has passed the plane of the teeth there has been no attempt made. Once an attempt is made, it must be documented in the PCR as SUCCESSFUL ("S") or UNSUCCESSFUL ("U"). An *examination* of the airway is NOT an attempt. In most cases it is simply an examination, or in some cases, a useful method of assisting with suctioning of the airway.

*** SUCCESSFUL-** "S": A successful ETI is one in which you witness:

1) The ETT pass through the vocal cords.
2) Upon ventilation no abdominal or epigastric sounds are heard, and
3) Upon auscultation, bilateral breath sounds are heard.

You must document why your ETI is successful. An example of this would be "ETI successful after seeing the ETT pass through the vocal chords, confirmed with good bilateral lung sounds and end-tidal CO2 device applied." *In all cases of ETI, documentation of end-tidal CO2 use is mandated.*

*** UNSUCCESSFUL-** "U": An unsuccessful ETI attempt is when you are unable to place the ETT. Common reasons for inability to intubate include:

1) Inability to visualize landmarks.
2) Intubation attempt exceeds 15 second time limit.

You must document why your ETI was unsuccessful. An example of this would be: "unable to visualize cords secondary to: emesis; negative end-tidal CO2 confirmation; clenched teeth, or esophageal placement."

V. Principles Regarding Successful Placement and Confirmation of ET Placement

Any four of the following airway verification checks will be reviewed prior to, and checked after all intubation attempts. **These checks will be used in conjunction with waveform capnography, which is mandated on all intubated patients**.

Manual checks:

1. Visualizing the tube passing through the patient's vocal cords.
2. Noting tube condensation or fog with ventilation.

3. Noting chest rise and fall with ventilation.
4. Noting the presence of breath sounds bilaterally.
5. Noting the absence of gastric sounds with ventilation.
6. Use of an esophageal detection device.

- Reconfirmation of ETT position should be done in all patients when their clinical status changes, or when there is any concern about proper tube placement.

- Pulse oximetry and esophageal detector devices are not as reliable as end-tidal CO2 devices in patients who have adequate tissue perfusion.

- Placement of a c-spine immobilization collar on all patients who have been intubated is required in instances where the collar fits correctly.

VI. Documentation

All attempts to intubate (successful or unsuccessful placement) will be reported on the PCR. The PCR must also include documentation of the manual checks listed above, along with waveform capnographic readings.

VII. Skill Maintenance

Maintaining a high level of ETI skill proficiency is a priority in Santa Cruz County's CQI Program. Periodic reviews of paramedic intubations are ongoing and include documentation of ETI attempts and successes. Annual manikin training may be required to maintain County accreditation.

King Laryngeal Tube (LTD)

I. Indications for an LTD.

The LTD is to be used in instances where endotracheal intubation is indicated, but cannot be performed successfully in a timely fashion. Placement of an LTD in an adult or pediatric patient is a STANDING ORDER for EMTs and medics trained in its use. It may be done prior to establishing contact with the Base Hospital according to the following indications:

1 Cardiac Arrest.
2. Respiratory Arrest.
3. Severe respiratory failure with impending respiratory arrest.
4. Unstable airway or impending airway obstruction.

II. Use of Versed (Paramedics only)

Versed may be used as an adjunct to LTD placement in those patients who are in need of advanced airway management, but are unable to be managed due to combativeness, clenching, trismus, etc. In these cases, Versed is a STANDING ORDER and may be used without first contacting the Base Hospital. Nevertheless, in ALL CASES where Versed is used, early notification of the Base Hospital is advised. If unable to manage a patient's airway after initial dose of Versed, Base Hospital contact is required for subsequent doses. The maximum initial dose 5mg IVP/IO or 10mg IM. Pediatric dosing is 0.1mg/kg IVP/IO or 0.2mg/kg IM with a maximum initial dose of 3mg.

III. Principles Regarding Successful Placement and Confirmation of LTD Placement

The following four airway verification checks will be reviewed prior to, and checked after all LTD placement attempts. **These checks will be used in conjunction with waveform capnography, which is mandated on all patients in whom an LTD is placed.**

Manual checks:

1. Noting tube condensation or fog with ventilation
2. Noting chest rise and fall with ventilation
3. Noting the presence of breath sounds bilaterally
4. Noting the absence of gastric sounds with ventilation

- Reconfirmation of LTD position should be done in all patients when clinical status changes, or when there is any concern about proper tube placement.

- Pulse oximetry is not as reliable as end-tidal CO2 devices in patients who have adequate tissue perfusion.

- Placement of a c-spine immobilization collar on all patients who have been intubated is required in instances where the collar fits correctly.

IV. Notes

- Use of oxygen powered ventilation devices to ventilate patients is EXPRESSLY PROHIBITED.

- Placement of the LTD shall follow all approved County procedural steps.

- The LTD may be placed initially, even without an actual endotracheal attempt, if the paramedic deems this is the timeliest way to manage the patient's airway.

V. Documentation

All attempts to place an LTD will be reported on the PCR. The PCR must also include documentation of the manual checks listed above, along with waveform capnographic readings.

VI. Skill Maintenance

Periodic audits and regular training reviews will insure LTD skill maintenance.

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1080 EMELINE AVENUE, SANTA CRUZ, CA 95060
(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

EMERGENCY MEDICAL SERVICES PROGRAM

Policy No. 5100
Reviewed 07-07

Emergency Medical Services Program

Approved

Medical Director

Subject: INTRAOSSEOUS INFUSION

I. Purpose:

Gaining vascular access on critical patients of all ages can be very challenging. Difficulties in gaining timely access delay the administration of fluids and medications necessary to appropriately manage these patients. Intraosseous access provides a safe, timely, and effective alternative vascular access route.

II. Indications

A. IO access should be utilized in those critical (status 4 or 5) patients requiring vascular access for the immediate administration of fluids or medications when venous access attempts have failed, or are deemed likely to lead to significant treatment delays. In addition, patients must have at least one of the following:
• An altered mental status.
• Respiratory compromise.
• Hemodynamic instability.

B. Intraosseous access using the EZ-IO Drill is authorized for use on adults weighing >40 kg utilizing the EZ-IO adult needle. Pediatric patients weighing 3 kg to 39 kg the EZ-IO PD needle will be used.

III. Contraindications

A. IO administration is not allowed in patients who do not require *immediate* fluid or medication therapy, or in whom an intravenous line can be established in a timely fashion. IO insertion will never be performed for prophylaxis.

B. Fracture of the bone selected for IO infusion (*consider alternate site*)

C. Previous orthopedic procedures (IO within 24 hours, knee or shoulder replacement, etc.)

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(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5300
April 1, 2012

Emergency Medical Services Program

Approved

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Medical Director

Subject: NEEDLE THOROCOSTOMY

A. This procedure is indicated for the patient who is *in extremis* and has clinical signs of a tension pneumo-thorax.

B. Patient must have sufficient anatomical landmarks to identify structures needed to perform procedure.

C. Base Station contact is not required prior to procedure. Base Station contact shall be made, as soon as possible, after the procedure is performed.

D. Paramedics are only authorized to establish needle thorocostomy using the anterior, midclavicular approach. Lateral chest wall needle thorocostomy is prohibited.

E. All patients with needle thoracostomy are considered *in extremis* and will be transported to the closest receiving hospital.

D. Pre-existing medical condition (tumor at the insertion site, significant peripheral vascular disease, etc.)

E. Infection at the insertion site.

F. Inability to identify landmarks required to perform procedure.

IV. Procedure

A. Intraosseous access is approved in the tibial, medial malleolar, or humeral sites, although the tibial or medial malleolar sites are preferable."

B. Paramedics will follow the approved insertion method as outlined in the County-mandated training curriculum.

C. If conscious, the patient will be administered Lidocaine IO, 40mg in adult patients and 0.5mg/kg (max 40mg) in pediatric patients, for local anesthesia prior to fluid administration.

V. Training/QA

A. In order to perform this skill a paramedic must complete a County-approved IO 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 intraosseous insertion cases will be subject to audit as deemed appropriate by the County EMS Quality Improvement Committee.

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(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5400
Reviewed 4/2009

Emergency Medical Services Program

Approved

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Medical Director

Subject: PROCEDURE FOR EMS PERSONNEL REGARDING DO NOT RESUSCITATE (DNR) ORDERS/DIRECTIVES

I. Procedure:

A. All patients with absent vital signs who do not meet criteria for pronouncement or determination of death as defined in Santa Cruz EMS Agency Policy #1140 shall be treated with resuscitative measures. A prehospital provider may withhold or discontinue resuscitative measures under the following circumstances:

1. The provider sees a signed (by both patient and physician) CMA/EMSA-approved Emergency Medical Services Prehospital DNR Request Form (original or copy) or signed Physician Orders for Life-Sustaining Treatment (POLST) form, or
2. The provider sees that the patient is wearing an EMSA/CMA-approved DNR medallion, or
3. During transports between licensed medical/nursing facilities (between hospitals, nursing homes, clinics, etc.) the provider sees a DNR order signed by a physician in the patient's medical record, or
4. If the patient is at a licensed medical/nursing facility, the provider sees a DNR order signed by a physician in the patient's medical record and/or the facility's staff orally confirms a DNR order to the provider, or
5. The provider sees a signed Durable Power of Attorney for Health Care (DPAHC) that specifies withholding resuscitative measures, as described in Policy #1190, Guidelines for EMS Personnel Regarding DNR Orders/Directives, and the attorney in fact is present, or
6. The provider directly receives an order over the telephone from the patient's physician or from the Hospice Caring Project medical director.
(Note: The provider must be convinced that the physician is the patient's physician).

B. Positive identification of the patient is required. A witness who can positively identify the patient must be present, except in cases of interfacility transfers where the patient is assumed to have been positively identified by the transferring facility. The witness shall also be positively identified by the provider. The provider shall document the witness's name on the patient care record.

C. If the patient is conscious and states he/she wishes resuscitative measures, the DNR order shall be ignored.

D. If the patient is transported, the DNR form (original or copy), POLST form, DNR medallion, DPAHC form, or a copy of the valid order from the patient's medical record shall be taken with the patient to the receiving facility.

E. Contact the Base Hospital as needed.

F. If resuscitative measures have been initiated and a valid DNR order, POLST form, or DPAHC with the presence of the attorney in fact is later presented, resuscitative measures may be discontinued without base hospital contact.

G. The California EMS Authority must approve manufacturers of DNR medallions. These medallions are imprinted with the toll-free information telephone number and a unique patient identification number.

II. Special Circumstances

A. Whenever doubt exists as to the validity of a DNR or POLST order, paramedics should contact the Base Hospital and request direction from the Base Hospital physician.

B. In the event the patient expires while being transported, the following should be considered:

1. Unless specifically requested, the patient should not be returned to a private residence or skilled nursing facility.
2. Continue to the destination hospital or return to the originating hospital if time is not excessive.

C. In the event of a suicide attempt by a patient with a valid DNR, POLST, or DPAHC, the patient shall be treated with full resuscitative efforts.

III. Conflicting Orders

A. DNR Orders – in the event that any individual on scene disagrees with a DNR/POLST order, resuscitation should <u>not</u> be withheld.

B. DPAHC – Any orders given by an attorney in fact should be followed unless another individual named as attorney-in-fact in the DPAHC and present on scene disagrees with the order given. In such cases, resuscitation should <u>not</u> be withheld.

C. In the event that personnel are presented with multiple documents regarding the patient's resuscitation status, the document with the most recent dating and signatures will be honored.

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EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5500
Reviewed 01/07

Emergency Medical Services Program

Approved

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Medical Director

Subject: ACCESSING PRE-VASCULAR ACCESS DEVICES (PVAD)

I. Purpose:

Considerable healthcare previously only done in the hospital is now being provided in the home setting. Therefore the EMS system is more often encountering patients out of the hospital who have various permanent or semi-permanent venous access devices. This policy attempts to provide guidance when paramedics should consider the use of these devices when contemplating resuscitation.

II. Policy:

A. PVAD should be considered as the vascular access of last choice.

B. In every case, these persons should be acuity levels 4 or 5 only.

C. In every case, Base Hospital contact must be made in advance.

D. Documentation should clearly note the use of PVAD after base contact. Notation should include at a minimum:

1) Route.

2) Complications of procedure.

3) Effect of treatment.

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(831) 454-4120 FAX: (831) 454-4488 TDD: (831) 454-4123

EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5600
Reviewed 4/1/2014

Emergency Medical Services Program

Approved

Medical Director

Subject: PAIN MANAGEMENT

I. Purpose:

To provide monitored pain reduction to patients having moderate to severe pain using BLS measures, Fentanyl Citrate, Morphine Sulfate, and in some instances, Versed. In addition to relieving suffering, pain reduction has been shown to facilitate more accurate patient assessments, ease extrications, calm patients and allow field personnel to give better patient care. The purpose of this policy is to provide *pain management*, not to eliminate pain altogether.

II. Guidelines:

A. Prior to administering Fentanyl or Morphine gather a thorough patient description of the pain. This should include an accurate PQRST and 1-10 scale rating or other, age appropriate assessment tools. Gather a thorough physical assessment of the patient including vital signs, oxygen saturation, capnography, and EKG (when appropriate).

B. **Fentanyl is the preferred medication for controlling pain in both adult and pediatric patients. It is preferred over Morphine because it has a much shorter duration of action, induces less nausea, and is less likely to cause a histamine reaction in the patient. Fentanyl at a dose of 100 mcgs provides the same analgesia as Morphine 10 mg.**

Fentanyl Citrate is not indicated for cardiac chest pain because it does not create the histamine release that dilates vessels. This is the mechanism that reduces cardiac workload.

C. Versed is to be used ***only*** as an adjunctive medication to Morphine, not as the primary medication for managing pain. Versed can help to reduce both the psychological and physiological response to particularly severe pain, reducing the patient's suffering and allowing responders to more easily and effectively manage the patient. **Versed is NOT to be used adjunctively with Fentanyl due to the risk of severe respiratory depression.**

The goal of Versed use is ***not*** to induce heavy sedation, but rather to improve pain management. To this end, only small doses of Versed will be used after initial Morphine administration is found not to provide adequate pain relief. In particular, Versed can be helpful in managing those patients who exhibit an extreme anxiety and fear response to their pain.

Responders should be aware that Versed may cause respiratory depression and hypotension, particularly when used with Morphine, and should be used only in situations which truly warrant its administration. In these instances, patients should be carefully monitored for adverse reactions or over sedation.

When a patient has received both Morphine and Versed, two EMS providers (EMT/paramedic or two paramedics) must accompany the patient in the ambulance to the hospital. This will insure that the patient will be properly managed should severe respiratory depression occur.

D. **BLS measures should always be used prior to medication to reduce pain. BLS measures include, but are not limited to, cold packs, repositioning, elevation, splinting/immobilizing, psychological coaching, and bandaging.**

E. When administering Fentanyl, Morphine and Versed, monitor the patient closely. Have Narcan readily available to reverse any respiratory depression that may occur. **The patient should be monitored with continuous pulse oximetry as well as with end tidal capnography.** Remember that capnography provides better real time monitoring of the patient's ventilation status, and will alert you more quickly than pulse oximetry should respiratory depression occur.

F. Carefully document all medication responses in your PCR; this should include any changes in the patient's pain status, as well as reassessments of vital signs.

G. The preferred route of administration is IV or IO; however, if an IV or IO cannot be established, administer the medication IM (except for cardiac chest pain patients).

H. Measurement of a patient's pain is largely subjective; therefore s/he is the best determinant of the presence and severity of pain. All patients expressing verbal or behavioral indicators of pain shall have an appropriate assessment and management as indicated and allowed by this policy.

I. This policy is specifically indicated for patients with moderate to severe pain. Make base station contact if there is any question about whether or not the patient meets inclusive criteria. Co-morbid factors such as extremes in age and significant medical problems can affect the patient's ability to tolerate pain medication. In these cases, dosing should be adjusted accordingly.

III. Pain Management and Medication Administration

Pain Management Criteria	Base Station Contact	Treatment
A. Significant Burns	**No**	**Morphine Sulfate for adults:** 3 – 5 mg IVP/IO, or 10 mg IM to a total of 20 mg. **Morphine Sulfate for pediatrics:** 0.1 mg/kg IV/IM (no more than 5 mg per dose) to a total of 10 mg. **Fentanyl Citrate for adults:** 50- 100 mcg IVP, IO, IM, or IN to a total of 200 mcg **Fentanyl Citrate for pediatrics:** 1mcg/kg IV/IO, IM or IN; may repeat 1 mcg/kg in 10-15 minutes prn pain for a total of 2 mcg/kg; max of 100 mcg total.
B. - Significant extremity injuries (including hips) - Crush Injuries - Snake Bites - Back Pain - IO fluid administration	**No** (unless more than 10mg needed)	**Morphine Sulfate for adults:** 2 – 5 mg IVP/IO or 5 mg IM up to a total of 10 mg. **Morphine Sulfate for pediatrics:** 0.1mg/kg IV/IM to max of 5 mg. **Fentanyl Citrate for adults:** 50- 100 mcg IVP, IO, IM, or IN up to a total of 100 mcg. **Fentanyl Citrate for pediatrics:** 1mcg/kg slow IV/IO, IM or IN; may repeat 1 mcg/kg in 10-15 minutes prn pain for a total of 2 mcg/kg; max of 50 mcg total.

Pain Management Criteria	Base Station Contact	Treatment
C. - Cardiac Chest Pain (adults only)	**No** (unless more than 5mg needed)	**Morphine Sulfate for adults:** 2 – 5 mg IVP/IO (no IM with cardiac chest pain).
D. - Increased dosing for patients listed above - Critical thoracic trauma - Critical abdominal trauma - Head trauma (superficial) - Women in labor - Abdominal Pain - Headache without focal symptoms - Patients with pain not listed above	**YES**	Contact base MD prior to administering morphine sulfate or Fentanyl Citrate. Dosing per MD order only. **Adult Morphine Sulfate Range:** 2-5mg IV/IM to a total of 10mg. **Pediatric Morphine Sulfate Range** 1-3mg IV/IM to a total of 5mg. **Adult Fentanyl Citrate Range** 50- 100 mcg IVP, IO, IM, or IN to a max of 100mcg. **Fentanyl Citrate for pediatrics:** 1mcg/kg IV/IO, IM or IN; may repeat 1 mcg/kg in 10-15 minutes prn pain for a total of 2 mcg/kg; max of 50 mcg total.

E. Versed (adjunctive to Morphine – <u>not to be used adjunctive to Fentanyl</u>)

Adults:

- Versed 1 – 2.5 mg IV/IO, or 2.5 – 5 mg IM. Make base station contact for further dosing. Monitor the patient carefully for hypotension and hypoxia.

Pediatrics:

- Versed 0.1 mg/kg IV/IO to a maximum of 2 mg total, or 0.2 mg/kg IM to a maximum of 3 mg total. Make base station contact for further dosing. Monitor the patient carefully for hypotension and hypoxia.

F. Relative Contraindications:

-Closed head injury	-Patients with decreased respirations
-Inadequate perfusion	-Evidence of hypoxia
-Altered mental status	-Sudden onset acute headache

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EMERGENCY MEDICAL
SERVICES PROGRAM

Policy No. 5700
Reviewed 4/2009

Emergency Medical Services Program

Approved

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Medical Director

Subject: PEDIATRIC FAST PACK

I. Purpose:

Critically ill and injured pediatric patients occur infrequently in pre-hospital EMS. They constitute a high hazard, low frequency event in the field. These calls require EMS crews to perform rapid assessments and provide timely critical interventions. These tasks are complicated by the varying statures and weights of children which require crews to quickly size equipment, and compute drug dosages and defibrillation settings.

The Pediatric Fast Pack (PFP) has been designed to assist EMS crews in providing accurate BLS and ALS care to children utilizing a length-based system that incorporates all Santa Cruz County EMS pediatric policies and protocols.

II. Indications / Requirements

The PFP may be used on all relevant pediatric calls. It is a mandated piece of prehospital equipment, and as such, will be carried by all frontline ALS ambulances and fire apparatus in the County. While its use is highly encouraged, crews may also utilize other computation and measurement methods for arriving at correct equipment sizing, drug dosing, and defibrillation/cardioversion settings.

The PFP uses accepted numerical rounding techniques for some small volume drug dosages on low weight patients. These have been approved by the Santa Cruz County EMS Medical Director.

III. Contraindications:

None.

IV. Procedure

A. Size the patient using the Pediatric Fast Pack Tape.

B. Establish the child's weight in kilograms, and choose the correct colored divider.

C. Refer to the enclosed protocol-based reference cards and airway adjuncts as appropriate.

D. Utilize other equipment – BVMs, OB Kits, etc. – found in the Pack's side pouches and other sub-compartments as needed.

E. EZ-IO, medications, and other medical supplies will be carried in separate carry-on bags/cases.

V. Documentation

Paramedics should document use of the Pediatric Fast Pack in their PCRs when appropriate. (example: "Drug dosing was arrived at using the Pediatric Fast Pack.")

VI. Training/QA

All paramedics using the Pediatric Fast Pack will complete a County-approved training program, and will review its use at the annual mandatory skills review required for continued County paramedic accreditation.

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(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

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.

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(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

EMERGENCY MEDICAL SERVICES PROGRAM

Procedure No. 5900
Reviewed 04/01/2010

Emergency Medical Services Program

Approved

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Medical Director

Subject: 12 LEAD ECG PROCEDURE

I. Purpose

The application and interpretation of 12 Lead ECGs is a critical skill needed to identify ST Elevation MI (STEMI), cardiac ischemia, cardiac conduction abnormalities, and arrthymias. This procedure outlines the inclusion criteria for use of the 12 Lead ECG, and the procedure for implementing it.

II. 12 Lead ECG Inclusion Criteria

A. Chest pain /anginal equivalent symptoms

1. Chest pain consistent with Acute Coronary Syndrome (ACS). Suspicion of ACS is primarily based upon patient history: chest discomfort, jaw pain, arm pain, neck pain, etc.
2. Be alert to patients likely to present with atypical symptoms or "silent AMIs": women, the elderly, and diabetics. Atypical symptoms may include non-pulmonary shortness of breath, syncope, dizziness, diaphoresis, nausea/vomiting, or altered level of consciousness.
3. Patients with chronic SOB such as a COPD may be included if there are additional new symptoms such as dizziness, weakness, diaphoresis, nausea/vomiting or ALOC.

B. Consider 12-lead when the following conditions are present:

1. Arrhythmias
2. Cardiogenic pulmonary edema
3. Cardiogenic shock
4. Post cardiac arrest (ROSC)

III. 12 Lead ECG Transmission Criteria

ECGs should be transmitted to the appropriate hospital when a confirmed or suspected STEMI has been identified, or whenever paramedics need consultation regarding the interpretation and treatment of any 12 Lead ECG rhythm.

IV. 12 Lead ECG Procedure

1) Expose Chest. Remove excess chest hair, prep skin. May leave bra in place if not interfering with lead placement.
2) Place electrodes on chest and limbs. See section below (12-lead placement).

3) Acquire ECG tracing as per manufacturer's directions. ECG can be done prior to medication administration if it can be done in a timely fashion. Paramedics may acquire ECG at incident location or in vehicle prior to beginning transport.
4) When indicated, transmit the ECG to the receiving hospital and complete a call-in.
5) Observe patient identification conventions for labeling the ECG prior to transmission.
6) Leave electrodes in place unless defibrillation or cardioversion is required.
7) Make hard copy of ECG and keep with PCR.

V. Documentation

PCR documentation should reflect findings of 12-lead ECG.

VI. 12-Lead Electrode Placement

1) Limb leads should be placed lateral deltoids and mid-thighs if possible. May be moved onto trunk if needed.
2) Chest leads should be placed:
    a. V1 – 4th intercostal space at the right sternal border
    b. V2 – 4th intercostal space at the left sternal border
    c. V3 – Directly between V2 and V4
    d. V4 – 5th intercostal space at left midclavicular line
    e. V5 – Level of V4 at the left anterior axillary line
    f. V6 - Level of V4 at left mid-axillary line

County of Santa Cruz

HEALTH SERVICES AGENCY

POST OFFICE BOX 962, 1080 EMELINE AVENUE SANTA CRUZ, CA 95061-0962
(831) 454-4120 FAX: (831) 454-4272 TDD: (831) 454-4123

EMERGENCY MEDICAL
SERVICES PROGRAM

Procedure No. 6000
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Emergency Medical Services Program

Approved

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Medical Director

Subject: **TRANSCUTANEOUS CARDIAC PACING**

I. Definition:
Transcutaneous pacing is a technique of electronic cardiac pacing accomplished by using skin electrodes to pass repetitive electrical impulses through the thorax.

II. Indications
Transcutaneous pacing should be considered in those pediatric and adult patients experiencing substantially symptomatic bradycardia, no matter the etiology. In general, symptomatic bradycardia is defined as a patient with a heart rate of less than 60 bpm with significant hypotension/signs of shock.

Non-cardiac origins of symptomatic bradycardia in adults include hypoxia, trauma, drug overdose, electrolyte imbalances and hypothermia. Symptomatic bradycardia in children is usually secondary to hypoxia, and less commonly, due to a toxic ingestion. *In both adults and children, effort should be made by care providers to correct these causes of bradycardia prior to pacing, when possible.*

Transcutaneous pacing of pediatric patients should be reserved for children with profound symptomatic bradycardia refractory to BLS and ALS interventions and by Base Physician order unless the child is ***in extremis***. Use pediatric pacing electrodes for children less than 15 kg.

III. Contraindications
- Asystole or brady-asystolic arrest
- Non-intact skin at the electrode site
- Patients with signs of serious blunt or penetrating trauma

IV. Procedure

a. Explain procedure to patient and consider sedation.[1] Sedation is not mandatory.
b. Establish IV/IO access if possible. Do not delay pacing in grossly unstable patients to do so.
c. Place monitoring and pacing electrodes. Anterior/posterior pacing electrode placement is preferred, though anterior/lateral placement is also acceptable. Verify that the pacing and monitoring electrodes are adequately spaced from one another to prevent ECG interference.
d. Set initial pacing rate at 80 bpm. ECG monitor should be set to the **demand** pacing mode.
e. Begin output current at 0 milliamps (mA). Increase output in 10 mA increments until electrical capture is noted. Following this, confirm that mechanical capture (pulses) has also been achieved. Assessment of capture should show pacer spikes that are followed by QRS complexes, with corresponding pulses.
f. If capture is maintained but the patient still remains symptomatic (BP of less than 90 systolic, poor skin signs, delayed capillary refill, weak pulses, ALOC), consider increasing the rate in 10 bpm increments until 100 bpm is achieved.
g. If patient comfort is maintained, continue pacing. If the patient is uncomfortable, consider sedation. Another option is to reduce current output in 5 mA increments to a point just above electrical and mechanical capture.
h. If perfusion remains problematic, make base station contact to discuss an order for dopamine with the base station physician.
i. If the patient remains unconscious during pacing, monitor vital signs carefully. In cases where electrical capture is achieved with no palpable pulses, consider following Protocols C2 or C2-P, Pulseless Electrical Activity (PEA).
j. A paper copy of the ECG obtained during this procedure should be delivered to the receiving hospital, and should be attached to the patient's PCR.

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[1] **Sedation for Patients Being Paced**

Sedation may include the use of Versed and Morphine Sulfate to reduce the discomfort.

Adults:

- Versed 1 – 2.5 mg IV/IO, or 2.5 – 5 mg IM. May be repeated to a total of 5 mg IV/IO, 10 mg IM.

- Morphine Sulfate: 2 – 5 mg IV/IO, or 10 mg IM. Morphine Sulfate should only be used if treatment with Versed is not adequate to control the discomfort caused by this procedure. Monitor the patient carefully for worsened hypotension and hypoxia.

Pediatrics:

- Versed : 0.1 mg/kg IV/IO to a maximum of 2 mg total, or 0.2 mg/kg IM to a maximum of 3 mg total.

- Morphine Sulfate: 0.1 mg IV/IO/IM to a maximum of 5 mg. Morphine Sulfate should only be used if treatment with Versed is not adequate to control the discomfort caused by this procedure. Monitor the patient carefully for worsened hypotension and hypoxia.