

# 2007 ADVANCED LIFE SUPPORT TREATMENT PROTOCOLS

## CONTENTS

	<u>Policy Reference Number</u>
ADVANCED LIFE SUPPORT PROTOCOLS.....	600
UNIVERSAL ALGORITHM.....	601
ADULT HEMODYNAMIC INSTABILITY DEFINITIONS .....	602
ADULT SEIZURES .....	603
ADULT ALLERGIC REACTION/ANAPHYLAXIS .....	604
ADULT ALTERED LEVEL OF CONSCIOUSNESS.....	605
ADULT BRADYCARDIA.....	606
ADULT CARDIAC CHEST PAIN .....	607
ADULT HYPOTENSION/SHOCK/MECHANISM OF INJURY .....	608
ADULT INTRAVENOUS THERAPY/VASCULAR ACCESS .....	609
ADULT PULSELESS ARREST .....	610
ADULT RESPIRATORY DISTRESS .....	611
ADULT SUPRAVENTRICULAR TACHYCARDIA.....	612
ADULT VENTRICULAR TACHYCARDIA WITH PULSE.....	613
ADULT PAIN MANAGEMENT .....	614
SPINAL PRECAUTIONS .....	615
OBSTRUCTED AIRWAY .....	616
NEEDLE CRICOTHYROTOMY .....	617
PARAMEDIC BASE STATION REPORT .....	618
12-LEAD EKG .....	619
INTRAOSSEOUS INFUSION.....	620
PEDIATRIC HEMODYNAMIC INSTABILITY DEFINITIONS .....	621
PEDIATRIC SEIZURES .....	622
PEDIATRIC ALLERGIC REACTION/ANAPHYLAXIS .....	623
PEDIATRIC ALTERED LEVEL OF CONSCIOUSNESS .....	624
PEDIATRIC BRADYCARDIA .....	625
PEDIATRIC HYPOTENSION/SHOCK/MECHANISM OF INJURY .....	626

**Policy Reference Number**

PEDIATRIC INTRAVENOUS/VASCULAR ACCESS THERAPY .....627

PEDIATRIC PULSELESS ARREST.....628

PEDIATRIC RESPIRATORY DISTRESS .....629

PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA .....630

PEDIATRIC VENTRICULAR TACHYCARDIA WITH PULSE.....631

PEDIATRIC PAIN MANAGEMENT .....632

SUBJECT: ADVANCED LIFE SUPPORT PROTOCOLS

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I. PURPOSE:

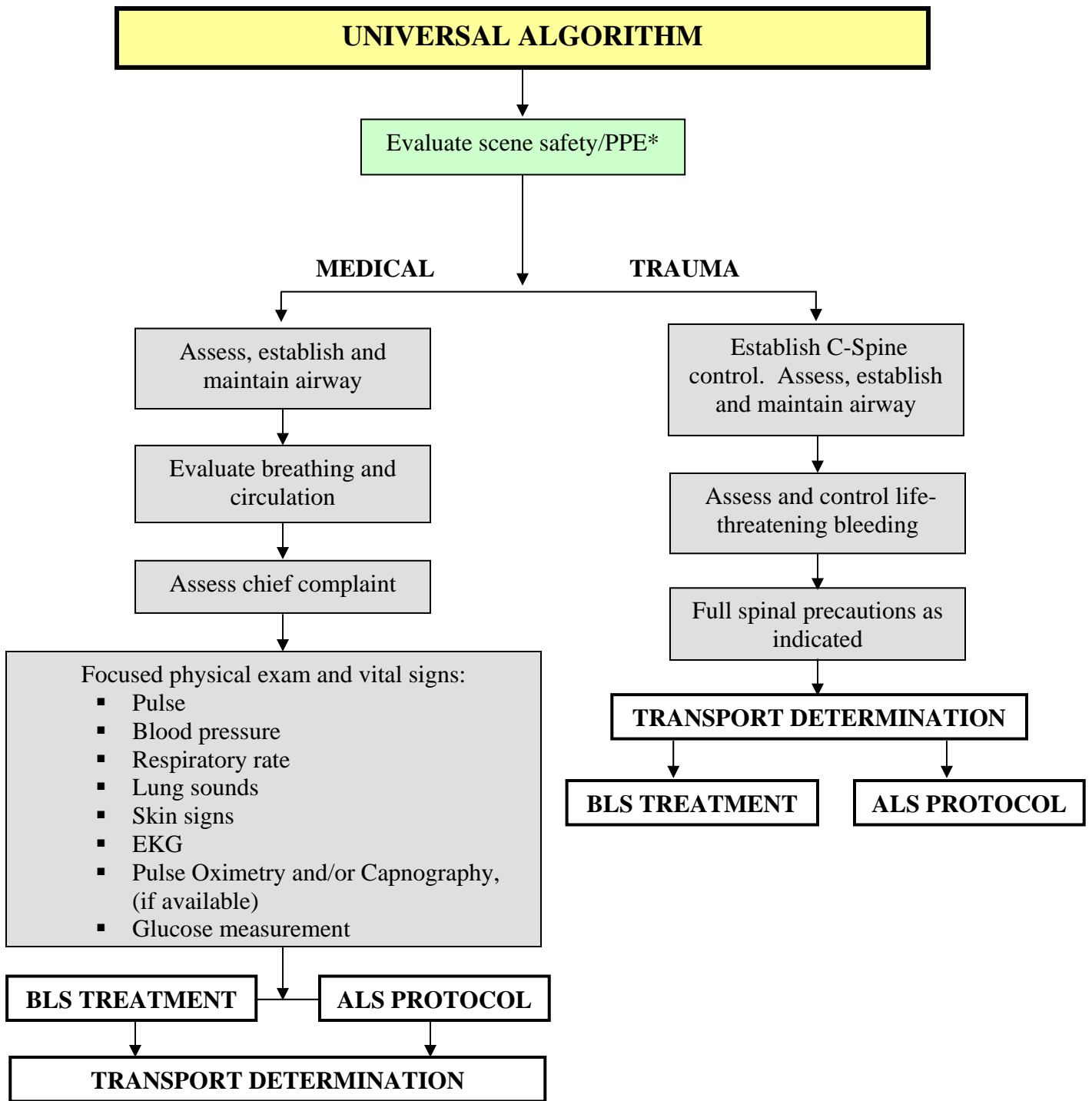
The Advanced Life Support (ALS) Adult and Pediatric Treatment Protocols provide uniform standards for ALS personnel to render prehospital medical care when responding to a medical incident or on an inter-facility transfer.

II. AUTHORITY:

- A. California Health and Safety code, Division 2.5, Section 1797.220
- B. California Code of Regulations, Title 22, Section 100144

III. POLICY:

- A. Licensed paramedics, either currently accredited, or while acting as a candidate for accreditation by the San Luis Obispo County Emergency Medical Services Agency, shall follow the ALS Treatment Protocols while on duty and rendering medical care.
- B. Paramedic personnel shall utilize ALS principles and skills as indicated in these protocols.
- C. Only on-duty paramedics, under the direction of an on-duty base station physician, may make deviations from these protocols.
- D. Paramedics shall use the protocol that is most closely associated with the patient's condition. Some situations may indicate the use of more than one protocol. Paramedics shall use their best judgment and consultation with the base station physician to determine which protocols to use.
- E. Arrows within the algorithms indicate instructions that optimally should be followed in sequential order, while lines without arrows indicate potential or concurrent use.
- F. After paramedic assessment, a paramedic may elect to have an EMT attend a stable BLS patient.



\*PPE= Personal Protective Equipment

## ADULT HEMODYNAMIC INSTABILITY DEFINITIONS

ANY OF THESE SIGNS OR SYMPTOMS MAY INDICATE AN UNSTABLE PATIENT:

### MEDICAL

- Blood pressure < 100 systolic
- Poor skin signs
- Altered level of consciousness
- Shortness of breath
- Pulmonary edema
- Chest pain

### TRAUMA

- Blood pressure < 100 systolic
- Poor skin signs
- Altered level of consciousness
- Shortness of breath
- Pulse > 120 BPM
- Poor capillary refill

TREATABLE/REVERSIBLE CONSIDERATIONS FOR CRITICAL PATIENTS:

- 1) Hypoxemia
- 2) Tachycardia
- 3) Bradycardia
- 4) Hyper/Hypothermia
- 5) Hyper/Hypovolemia
- 6) Altered Mental Status
- 7) Fractures/Bleeding/Tension Pneumothorax
- 8) Anaphylaxis
- 9) Chest Pain
- 10) Overdose

**ADULT SEIZURES**

- UNIVERSAL ALGORITHM**
- Identify and treat reversible causes
  - Establish vascular access

**IV ESTABLISHED**

**NO IV ESTABLISHED**

- **Diazepam** 0.3 mg/kg slow IVP, titrated to terminate seizure activity, not to exceed 20 mg

- **Diazepam** 0.3 mg/kg per rectum (PR) via a lubricated 3 ml syringe without a needle, titrated to terminate seizure activity, not to exceed 20 mg

# ADULT ALLERGIC REACTION/ANAPHYLAXIS

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein

STABLE

UNSTABLE

OBSERVE/MONITOR

Rash/Itching:

- Consult base station

### Dyspnea/Wheezing/Shock:

- **Albuterol** 2.5-5 mg via HHN/mask/BVM with adjunct, over 5-10 min, repeat as needed
- **Epinephrine 1:1,000** 0.01 mg/kg IM, not to exceed 0.5 mg, may repeat every 5 min, not to exceed 3 doses
- **Diphenhydramine** 2 mg/kg IVP/IM, not to exceed 50 mg

### Severe Shock/Extremis:

- **Epinephrine 1:10,000** 0.01 mg/kg slow IVP titrated, not to exceed 0.5 mg without base physician order

OR

If patient is in extremis and no IV access, administer:

- **Epinephrine 1:1,000** 0.01 mg/kg SL injection, not to exceed 0.5 mg, may repeat every 5 min, not to exceed 3 doses

## BASE PHYSICIAN ORDER ONLY

- **Diphenhydramine** 2 mg/kg slow IVP/IM for stable patient

# ADULT ALTERED LEVEL OF CONSCIOUSNESS

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access

STABLE

UNSTABLE

### OBSERVE/MONITOR

If blood glucose is < 60 mg/dl and patient can self administer:

- **Oral Glucose** 15 Gm (1 tube), repeat as needed

If blood glucose is < 60 mg/dl, administer:

- **Dextrose 50%** 25 Gm (50 ml) slow IVP

If blood glucose is < 60 mg/dl and no success with two (2) IV attempts, administer:

- **Glucagon** 1 mg IM

If narcotic overdose is suspected and respirations are inadequate, administer:

- **Narcan** not to exceed 2 mg initial dose IVP/IM, titrated to maintain adequate respirations

**OR**

If patient is in extremis and no IV access, administer:

- **Narcan** 0.4 mg **SL** injection, titrated to maintain adequate respirations

### BASE PHYSICIAN ORDER ONLY

- **Diazepam** with agitated or combative ALOC patient
- **Charcoal** 1Gm/kg, not to exceed 50 Gm

# ADULT BRADYCARDIA

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access

STABLE

UNSTABLE

### OBSERVE/MONITOR

- Obtain 12-lead EKG, if available

- Consider **Atropine** 0.5 mg IVP, repeat every 3-5 min, not to exceed 3 mg

- Obtain 12-lead EKG, if available

### BASE PHYSICIAN ORDER ONLY

- **Dopamine** 5-20 mcg/kg/minute
- **Sodium Bicarbonate** for tricyclic antidepressant OD
- **Calcium Chloride** for suspected hyperkalemia, suspected renal failure or calcium channel blocker OD
- **Glucagon** for beta blocker OD
- Higher doses of **Atropine** for organophosphate OD
- **Fluid Bolus** 500 ml NS

# ADULT CARDIAC CHEST PAIN

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access

BP < 100 SYSTOLIC

BP > 100 SYSTOLIC

- **Aspirin** 162 mg (non-enteric coated) tablets chewed and swallowed

- Obtain 12-lead EKG, if available

- **Nitroglycerin** 0.4 mg SL tablets or spray, may repeat every 5 min, not to exceed 3 doses
- Do not administer if BP drops < 100

- **Aspirin** 162 mg (non-enteric coated) tablets chewed and swallowed

- If no base contact and/or no significant change in patient condition:
- **Morphine** 2-10 mg slow IVP titrated to pain improvement

- Obtain 12-lead EKG, if available

## BASE PHYSICIAN ORDER ONLY

- **Dopamine** 5-20 mcg/kg/minute for persistent hypotension
- **Fluid Bolus** 500 ml NS

# ADULT HYPOTENSION/SHOCK/MECHANISM OF INJURY

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein

STABLE

UNSTABLE

OBSERVE/MONITOR

- **Normal Saline (NS) 500-1,000 ml Fluid Bolus** as rapidly as possible

If no base contact and/or no significant change in BP:

- **Second 1,000 ml Fluid Bolus** as rapidly as possible

- Consider second IV access
- Notify base station early for patient in extremis

## BASE PHYSICIAN ORDER ONLY

- Further infusion of NS after 2 fluid challenges

## ADULT INTRAVENOUS THERAPY/VASCULAR ACCESS

### UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access as indicated by patient condition

- Any instance in which the paramedic feels the need for a therapeutic or prophylactic IV (peripheral IV access only)

- For lifeline, utilize NS (0.9%) TKO or saline lock

- Consider second IV access

- Consider external jugular IV access for patients in need of IV fluid or medications without obvious peripheral IV sites

- Sublingual (SL) injection of select medications is permissive if patient is in extremis without rapid IV access
- Consider an IM/IO route in patients in extremis with no peripheral IV access



# ADULT RESPIRATORY DISTRESS

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access

### ASTHMA

#### Dyspnea/Wheezing/Shock:

- **Albuterol** 2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 min, repeat as needed
- **Epinephrine 1:1,000** 0.01 mg/kg **IM**, not to exceed 0.5 mg, may repeat every 5 min, not to exceed 3 doses

#### Severe Shock/Extremis:

- **Epinephrine 1:10,000** 0.01 mg/kg slow IVP titrated, not to exceed 0.5 mg without base physician order

**OR**

If patient is in extremis and no IV access, administer:

- **Epinephrine 1:1,000** 0.01 mg/kg **SL** injection, not to exceed 0.5 mg, may repeat every 5 min, not to exceed 3 doses

### PULMONARY EDEMA

- **Nitroglycerin** 0.4 mg SL tablets or spray, may repeat every 5 min, not to exceed 3 doses
- Do not administer if BP < 100 systolic

If no base contact or no significant change in patient condition (and BP > 100):

- **Morphine** 1-3 mg slow IVP

- **Furosemide** 0.5-1 mg/kg slow IVP

### COPD

- **Albuterol** 2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 min, repeat as needed

# ADULT SUPRAVENTRICULAR TACHYCARDIA

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein
- QRS < 0.12 seconds typical for SVT

**STABLE**

**UNSTABLE**

Attempt vagal maneuvers

Consider administration of **Adenosine**

If rhythm and symptoms remain unchanged:

- **Adenosine** 6 mg rapid IVP, followed immediately by a 20 cc NS bolus

If no conversion:

- **Adenosine** 12 mg rapid IVP, followed immediately by a 20 cc NS bolus, may repeat once

**SYNCHRONIZED / UNSYNCHRONIZED  
CARDIOVERSION SEQUENCES:**

Consider pre-medication if possible:

- **Diazepam** 2.5-10 mg IVP

### MONOPHASIC

100 J  
200 J  
300 J  
360 J  
or equivalent

### BIPHASIC

50 J  
70/75 J  
120 J  
150 J  
200 J  
or equivalent

## CONSIDERATIONS

- Vascular access may be omitted prior to cardioversion if in extremis
- If synchronized mode is unable to capture, then use unsynchronized defibrillation.
- Obtain 12-lead EKG, if available, before and after cardioversion

# ADULT VENTRICULAR TACHYCARDIA WITH A PULSE

**UNIVERSAL ALGORITHM**

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein
- QRS > 0.12 seconds typical for VT

**STABLE**

**UNSTABLE**

**Lidocaine: 1.5 mg/kg IVP**

**SYNCHRONIZED / UNSYNCHRONIZED  
CARDIOVERSION SEQUENCES**

If arrhythmia persists:

- Repeat **Lidocaine** 0.75 mg/kg IVP every 5-10 minutes, not to exceed 3 mg/kg

Consider pre-medication if possible:

- **Diazepam** 2.5-10 mg IVP

**MONOPHASIC**  
100 J  
200 J  
300 J  
360 J  
or equivalent

**BIPHASIC**  
50 J  
70/75 J  
120 J  
150 J  
200 J  
or equivalent

**Lidocaine 1.5 mg/kg IVP**

If arrhythmia persists:

- Repeat **Lidocaine** 0.75 mg/kg IVP every 5-10 minutes, not to exceed 3 mg/kg

**CONSIDERATIONS**

- Vascular access may be omitted prior to cardioversion if in extremis
- If synchronized mode is unable to capture, then use unsynchronized defibrillation.
- Obtain 12-lead EKG, if available, before and after cardioversion

# ADULT PAIN MANAGEMENT

## UNIVERSAL ALGORITHM

- Establish vascular access

For acute pain from the following:

- Isolated, single extremity, orthopedic injuries (significant fracture or dislocation only)
- OR**
- Significant burns without multi-system trauma or potential airway compromise

- **Morphine** 5 mg slow IVP titrated, not to exceed 10 mg

Notify the base physician of the **Morphine** administration

## BASE PHYSICIAN ORDER ONLY

- For other conditions and/or additional **Morphine** administration

## SUBJECT: SPINAL PRECAUTIONS

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- I. In general, all patients with blunt trauma, head trauma or axial spine trauma require that spine immobilization be implemented.
- II. Cervical spine precautions, in particular, **may be omitted** by paramedic personnel when all of the following conditions apply:
  - A. Normal neurological exam
    1. Alert
    2. Fully oriented to person, place, time and circumstances, or behavior appropriate to patient age and circumstances
    3. Baseline normal sensory and motor function in all extremities
  - B. Absence of midline neck and spinal pain by patient report for age < 65
  - C. Absence of neck or spinal tenderness elicited on palpation
  - D. No evidence of intoxication or impairment by any drug, including alcohol
  - E. Normal vital signs
  - F. Absence of any major painful injury that could distract the patient's ability to appreciate spinal pain
- III. ALS personnel **may release cervical spine precautions** applied by first responders when:
  - A. The physical exam and patient history have been completed
  - B. The patient meets the above criteria for omission

## SUBJECT: ADVANCED LIFE SUPPORT OBSTRUCTED AIRWAY PROTOCOL

---

### I. PURPOSE:

To establish an Advanced Life Support (ALS) protocol and policy for the assessment and treatment of the patient with partial or complete airway obstruction.

### II. POLICY

Certified paramedics, either accredited, or while acting as a candidate for accreditation by the San Luis Obispo County Emergency Medical Services Agency, shall follow this ALS treatment protocol while on duty and rendering medical care.

- A. Paramedic personnel shall utilize ALS principles and skills as indicated in this protocol.
- B. Deviations from this protocol shall be made by only on-duty paramedics only under the direction of an on-duty base station physician.

### III. ADULT OBSTRUCTED AIRWAY

#### A. CRITERIA/INDICATIONS

1. Universal sign of choking distress (hands grasping throat)
2. Absence of breath sounds and inability to ventilate
3. Observe for the presence of cyanosis and respiratory retractions
4. Inability to speak
5. Assess respiratory effort, i.e., crowing respirations, stridor, etc
6. Consider transport as early as possible

### IV. AUTOMATIC ORDERS:

#### A. CONSCIOUS

1. Assess ability to speak or cough. If able to speak or cough, obtain pulse oximetry reading and administer oxygen as necessary.
- ~~2. Administer abdominal/chest thrusts as appropriate until foreign body becomes dislodged and expelled or until patient becomes unconscious.~~
2. [Perform procedures for foreign-body airway obstruction according to current BLS training \(abdominal/chest thrusts, finger sweep\). \[Updated 7/12/07\]](#)

3. If obstruction is relieved, reassess and maintain airway as appropriate.
4. Obtain pulse oximetry reading.
5. Administer oxygen as appropriate.
6. Attempt base contact.

## B. UNCONSCIOUS

1. Place patient in supine position. Maintain in-line axial spine stabilization for suspected spinal injury.
2. Open airway and assess for respiratory effort.
3. If apneic, attempt to ventilate with BVM. If unable to ventilate, reposition and reattempt ventilation.
- ~~4. If unable to ventilate, perform five abdominal thrusts, finger sweep and reattempt ventilation.~~
4. [Perform procedures for foreign-body airway obstruction according to current BLS training \(abdominal/chest thrusts, finger sweep\). \[Updated 7/12/07\]](#)
5. If obstruction persists, attempt direct laryngoscopy and remove foreign body with Magil forceps, if visible.
6. If unable to relieve obstruction, perform percutaneous needle cricothyrotomy in accordance with EMS Agency Policy No. 617.
7. Upon securing an airway, ventilate and assess lung sounds. Obtain pulse oximetry reading and assess end-tidal CO<sub>2</sub>.
8. Attempt base contact.

## V. PEDIATRIC OBSTRUCTED AIRWAY

### A. CRITERIA/INDICATIONS

1. Inabilities to cry, speak, or cough
2. If unconscious, absence of breath sounds, inability to ventilate
3. Assess respiratory effort, e.g., stridor, nasal flaring, retractions
4. Altered level of consciousness
5. Assess for presence of cyanosis and drooling

6. Observe for grunting, tachypnea, and/or bradycardia
7. Consider transport as early as possible

## VI. AUTOMATIC ORDERS:

### A. CONSCIOUS

Assess for ability to cry, speak, or cough.

- ~~1. Administer abdominal thrusts (5 back thrusts and 5 chest thrusts for infant less than 1 year of age) until the foreign body becomes dislodged and expelled or until patient becomes unconscious.~~
1. [Perform procedures for foreign-body airway obstruction according to current BLS training \(abdominal/chest thrusts, finger sweep\). \[Updated 7/12/07\]](#)
2. If obstruction is relieved, reassess and maintain airway as appropriate.
3. Obtain pulse oximetry reading.
4. Administer oxygen as appropriate.
5. Attempt base contact.

### B. UNCONSCIOUS

1. Place patient in supine position. Maintain in-line axial spine stabilization for suspected or possible spinal injury. Infants and children may require under-shoulder support to achieve neutral cervical spine position.
2. Open airway and assess for presence of respirations and/or effort.
3. If apneic, attempt to ventilate with BVM. If unable to ventilate, reposition and reattempt ventilation.
- ~~4. If unable to ventilate, perform 5 abdominal thrusts (5 back thrusts and 5 chest thrusts for infant less than 1 year of age) and reattempt to ventilate.~~
4. [Perform procedures for foreign-body airway obstruction according to current BLS training \(abdominal/chest thrusts, finger sweep\). \[Updated 7/12/07\]](#)
5. If obstruction persists, attempt direct laryngoscopy and remove foreign body with Magil forceps if visible.
6. If unable to relieve obstruction, perform percutaneous needle cricothyrotomy in accordance with EMS Agency Policy No. 617.

7. Upon securing an airway, ventilate and assess lung sounds. Obtain pulse oximetry reading and assess end-tidal CO<sub>2</sub>.
8. Attempt base contact.

SUBJECT: ADVANCED LIFE SUPPORT, NEEDLE CRICOTHYROTOMY PROTOCOL

---

I. PURPOSE:

To establish an Advanced Life Support (ALS) protocol and policy for the use of needle cricothyrotomy as part of the San Luis Obispo County's Basic Scope of Practice as defined by the California Code of Regulations, Title 22, Chapter 4, Section 100145.

II. POLICY:

- A. Certified paramedics, either accredited, or while acting as a candidate for accreditation by the San Luis Obispo County Emergency Medical Services Agency, shall follow this ALS treatment protocol while on duty and rendering medical care.
- B. Paramedic personnel shall utilize ALS principles and skills as indicated in this protocol.
- C. Deviations from this protocol shall be made only by on-duty paramedics under the direction of an on-duty base station physician.

III. PERCUTANEOUS NEEDLE CRICOTHYROTOMY CRITERIA/INDICATIONS

- A. Complete upper airway obstruction resulting in severe respiratory distress which cannot be ventilated by conventional airway maneuvers in accordance with EMS Agency Policy No. 616
- B. This procedure is a temporary, non-definitive airway. Rapid transport and early notification is imperative.

IV. INDICATIONS

- A. Complete upper, unrelieved, airway obstruction possibly due to the following conditions:
  - 1. Epiglottitis
  - 2. Fractured larynx
  - 3. Foreign body aspiration
  - 4. Facial burns involving the upper airway
  - 5. Laryngeal edema
  - 6. Laryngospasm
  - 7. Massive facial trauma

V. AUTOMATIC ORDERS:

- A. Position the patient supine with head and neck in neutral position, maintaining in-line axial stabilization as indicated. Procedure is ideally performed facing the patient.

- B. Locate the cricothyroid membrane by palpating the space between the thyroid cartilage and the cricoid cartilage. Cleanse the area with providone-iodine solution and alcohol.
- C. Place the index finger of the non-dominant hand on the patient's thyroid cartilage and run the tip of the finger down the midline until the soft depression of the cricothyroid membrane is felt between the thyroid and cricoid cartilages. Keep the index finger in place on the cricothyroid membrane to positively mark the location.
- D. With the index finger in place on the cricothyroid membrane, use the thumb and middle finger of the same hand to stabilize the trachea from lateral movement. Move the tip of the index finger just enough to place the point of the needle directly over the cricothyroid membrane.
- E. Using a maximum 10 gauge, or smaller catheter over needle IV device, angle the needle about 45 degrees, pointing toward the patient's feet. Advance the needle through the cricothyroid membrane while aspirating the syringe. Aspiration of air indicates entry into the trachea. Stop advancing the needle as soon as air is aspirated.
- F. Advance the catheter over the needle, avoid bending the catheter while placing the catheter well into the trachea and angled downward. Withdraw the needle.
- G. Attach distal end of pre-cut, 3 mm endotracheal tube into catheter hub and ventilate using the appropriate size ambu-bag.
- H. Use tape and gauze to secure catheter to the neck as well as a dedicated individual who must maintain constant manual stabilization of catheter while ventilating the patient.
- I. Reassess lung sounds for presence of expanding hematoma or SQ air.
- J. In the event of above complications, consider removing catheter, sealing the opening, and repeating the procedure with rapid transport and early notification of base station of any difficulties.

## SUBJECT: PARAMEDIC BASE STATION REPORT POLICY

---

### I. PURPOSE:

To provide paramedics with a guideline to give a brief, clear report that provides pertinent information to base hospital personnel.

### II. POLICY:

Radio and telephone communications between paramedics and base hospital personnel shall conform with this policy. The presentation of information shall follow the algorithm format listed on Attachment A.

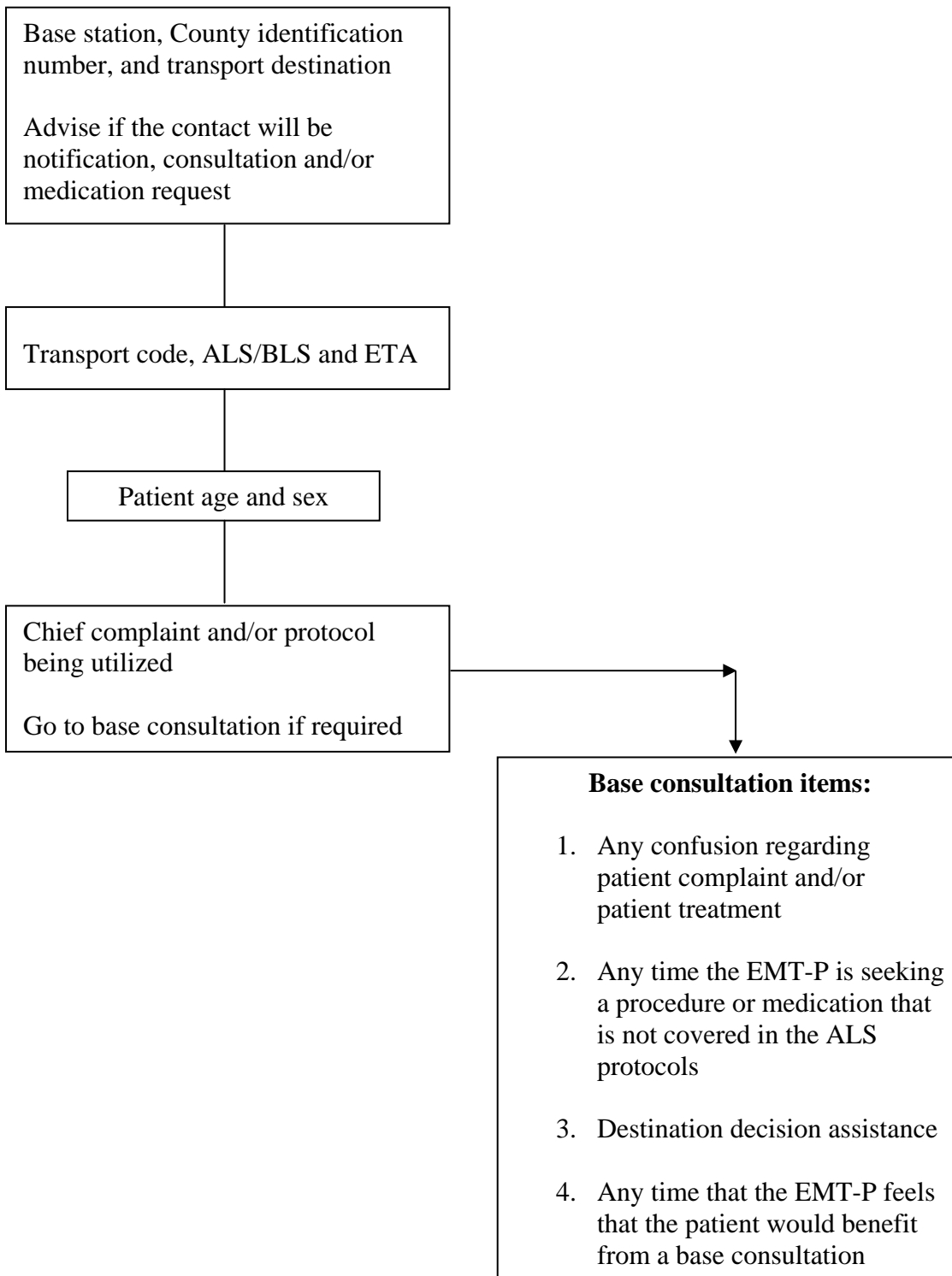
### III. ROUTINE BASIC LIFE SUPPORT NOTIFICATION

- A. Paramedics may directly notify any designated receiving hospital, if the patient has required only basic life support interventions.
- B. Provide the following information:
  - 1. Age
  - 2. Sex
  - 3. Chief complaint/mechanism of injury
  - 4. ETA
- C. Non-base hospitals shall not attempt to provide medical direction to paramedics. Non-base hospital personnel requesting additional interventions shall direct those requests to the appropriate base hospital and request that the paramedics contact that base hospital.

### IV. ADDITIONAL INFORMATION:

- A. Use simple language to avoid confusion caused by codes, e.g., “I copy” rather than “10-4.”
- B. Base hospital personnel should avoid requests of paramedics for information that is not essential in decision making.
- C. MICNs shall state their MICN identification number when receiving base station reports.
- D. Paramedics shall state their County identification number when making base station contact.

**BASE STATION REPORT FORMAT**



SUBJECT: PREHOSPITAL 12-LEAD EKG ACQUISITION, TRANSMISSION AND  
ALERT PROTOCOL FOR ACUTE CORONARY SYNDROME

---

I. PURPOSE:

To establish an operating policy for the acquisition, interpretation and transmission of a 12-lead EKG in the prehospital setting as well as to facilitate early notification of possible Acute Coronary Syndrome (ACS).

II. COMPETENCY:

**Only ALS personnel who are employed by an agency with an approved 12-lead EKG program and who have received the required training may perform a 12-lead EKG (see EKG Training Program Curriculum).** 12-lead EKG is an optional skill at this time.

III. PROCEDURE:

A. **Begin treating the patient utilizing the appropriate San Luis Obispo (SLO) County Emergency Medical Services Agency (EMSA) Protocol.** 12-lead EKG should be used in conjunction with, and not delay the use of the appropriate protocol.

B. INDICATIONS:

Medical history and/or presenting complaints consistent with possible Acute Coronary Syndrome (ACS). Patients may have one or more of the following:

1. Chest, upper abdominal or back pain suggestive of ACS, which is not relieved by the medications from the Chest Pain Protocol.
2. New onset cardiac dysrhythmia.
3. Unexplained syncope or near syncope.
4. Unexplained, acute generalized weakness with or without diaphoresis.
5. Acute onset of dyspnea suggestive of congestive heart failure (CHF).
6. Other signs or symptoms suggestive of ACS.

C. CONTRAINDICATIONS:

**Do not perform 12-lead EKG on these patients:**

1. Trauma. **There must be no delay in transport!**
2. Cardiac arrest.
3. Respiratory arrest.

D. TIMING:

1. **Do not delay transport to obtain a 12-lead EKG.**
2. If there will be **no** delay in transport obtain the first 12-lead while on-scene.
3. If there **would** be a delay in transport if a 12-lead EKG was performed prior to transport, attempt to obtain the first 12-lead EKG in the ambulance **prior** to moving.
4. Subsequent 12-lead EKGs should be obtained while transporting to the hospital. Serial 12-lead EKGs, en route, are encouraged.

E. BASE HOSPITAL COMMUNICATION:

1. Identify yourself, the form of base report that you are about to give (notification, consultation and/or medication request) and that this patient has possible ACS.
2. Notify the base station that a 12-lead has been acquired and if the EKG analysis indicates "MI SUSPECTED."
3. Notify the base station if the patient's chest pain has responded to prehospital interventions.
4. Advise the base station that you are going to transmit the 12-lead EKG. Please make every attempt to enter the patient's name and age prior to transmitting the 12-lead EKG so that the hospital can obtain an old chart. For reasons of confidentiality, do not give the name of the patient during the base hospital radio contact.
5. Transmit the 12-lead EKG.
6. MICN will expeditiously consult or notify the base physician of suggestive EKG and paramedic assessment, and verbalize/initiate ACS activation as appropriate.

F. DOCUMENTATION:

1. Document all of the patient findings on the Patient Care Report (PCR) and include a copy of the 12-lead EKG(s) for the emergency room staff.

IV. QUALITY IMPROVEMENT PLAN:

A. DATA COLLECTION:

Data must be collected on each 12-lead EKG performed. The ALS provider should develop a method for collecting the data that is compatible with their existing data collection process. The data collected must include at a minimum:

1. A copy of the 12-lead EKG.
2. Date and time of the call.
3. SLO County PCR number.
4. Crew member names.
5. Unit number.
6. Hospital destination (if applicable).
7. 12-lead EKG transmitted to the hospital (yes/no).
8. ST elevation (yes/no).
9. The interpretation of the EKG as read by the ALS personnel and MD.

B. DATA REPORTING:

The provider agency is responsible for submitting a quarterly report, corresponding with the timing of the EMSA Clinical Advisory Committee (CAC) meeting, which includes at a minimum:

1. The total number of 12-lead EKGs performed during the quarter.
2. The total number of 12-lead EKGs transmitted to the hospital during the quarter.
3. The interpretation of the 12-lead EKG as read by the provider agencies' Quality Improvement Committee (QIC).
4. The total number of "false positives" (12-lead EKGs read as having ST elevation by the ALS personnel, but determined by the provider agency QIC as **not** showing ST elevation).
5. The total number of "false negatives" (12-lead EKGs read as **not** having ST elevation by the ALS personnel, but determined by the provider agency QIC as showing ST elevation).
6. Copies of all 12-lead EKGs read as having ST elevation for review by the CAC and EMSA Medical Director.

C. OUTCOME DATA:

The provider agency will assist the EMSA CAC in obtaining outcome data from the receiving hospitals. The outcome data should include at a minimum:

1. Patient outcome (lived, transferred, died).
2. Type of intervention, if applicable (catheterization, fibrinolysis, conservative management, etc.).
3. Time of onset of symptoms to activation of 911.
4. Time from pre-hospital contact to EMS EKG and intervention.
5. Time of emergency room arrival to intervention (balloon inflation or fibrinolysis).
6. Any other input from the receiving hospitals.
7. Hospital ACS committee feedback and report of 12-lead interpretation/intervention for all ACS activations.

V. 12-LEAD EKG TRAINING PROGRAM CURRICULUM:

A. ALS personnel authorized to perform 12-lead EKGs must complete an eight-hour training program. The curriculum must include at a minimum:

1. Anatomy
2. Basic electrophysiology
3. Leads and lead placement
4. EKG boxes, sizes, and temporal relationships
5. Waves, complexes, intervals, and segments
6. Rate analysis
7. Rhythm interpretation
8. ST segments
9. ST elevation imposters
10. Acute MI and acute coronary syndrome
11. Bundle branch blocks
12. Case studies
13. Technical and protocol considerations

## SUBJECT: INTRAOSSEOUS INFUSION POLICY

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### I. PURPOSE:

To establish an Advanced Life Support (ALS) protocol and policy for the treatment of the adult and pediatric patient with intraosseous infusion (IO).

### II. POLICY:

Certified paramedics, either accredited, or while acting as a candidate for accreditation by the San Luis Obispo County Emergency Medical Services Agency, shall follow this ALS treatment protocol while on duty and rendering medical care.

- A. Paramedic personnel shall utilize ALS principles and skills as indicated in this protocol.
- B. Deviations from this protocol shall be made by only on-duty paramedics only under the direction of an on-duty base station physician.

### III. INDICATIONS:

- ~~▪ Tibial plateau location only, and~~
- ~~▪ Unconscious (GCS < 8), and~~
- ~~▪ Patient in extremis, hemodynamically unstable, respiratory arrest/cardiac arrest without peripheral IV access, and~~
- ~~▪ Unable to establish an IV after a total of 3 attempts and EJ evaluation, and~~
- ~~▪ For use only when above criteria are met and hospital arrival time >15 minutes~~
  
- For use only when the following criteria are met:
  - Unconscious (GCS < 8), and
  - Patient in extremis with hemodynamic instability or respiratory arrest/cardiac arrest, and
  - Unable to establish an IV after a total of 3 attempts and EJ evaluation.
- Tibial plateau location only. [Updated 7/12/07]

### IV. CONTRAINDICATIONS:

- Tibial or femur fx (consider alternate side)
- Knee replacement or previous IO attempt at site within 24 hrs
- Infection at insertion site
- Inability to locate landmarks
- Hypoglycemic patients needing D50 (unless in cardiac arrest)
- Suspected narcotic overdose patient requiring Narcan (unless in cardiac arrest)

### V. QA/QI:

- EMS QA representative for each agency will assure compliance with policy
- Document initial and ongoing training with FDA approved IO device according to EMS Agency QA Policy

- Any PCR indicating use of an IO device will be forwarded to each agency's QA coordinator

VI. OTHER:

- Base station consultation for possible pain management if patient becomes conscious and complains of pain at insertion site
- Procedure and IV flow rate per manufacturer's recommendation
- This procedure should not delay transport

## **PEDIATRIC HEMODYNAMIC INSTABILITY DEFINITIONS**

**ANY OF THESE SIGNS OR SYMPTOMS MAY INDICATE AN UNSTABLE PATIENT:**

### **MEDICAL**

- Poor skin signs
- Altered level of consciousness
- Shortness of breath
- Pulmonary edema
- Chest pain

### **TRAUMA**

- Poor skin signs
- Altered level of consciousness
- Shortness of breath
- Poor capillary refill

**TREATABLE/REVERSIBLE CONSIDERATIONS FOR CRITICAL PATIENTS:**

- 1) Hypoxemia
- 2) Tachycardia
- 3) Bradycardia
- 4) Hyper/Hypothermia
- 5) Hyper/Hypovolemia
- 6) Altered Mental Status
- 7) Fractures/Bleeding/Tension Pneumothorax
- 8) Anaphylaxis
- 9) Chest Pain
- 10) Overdose

# PEDIATRIC SEIZURES

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

IV ESTABLISHED

NO IV ESTABLISHED

- **Diazepam** 0.3 mg/kg slow IVP titrated to terminate seizure activity, not to exceed 10 mg

- **Diazepam** 0.3 mg/kg per rectum (PR) via a lubricated 3 ml syringe without a needle titrated to terminate seizure activity, not to exceed 10 mg

# PEDIATRIC ALLERGIC REACTION/ANAPHYLAXIS

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

STABLE

UNSTABLE

OBSERVE/MONITOR

Rash/Itching:

- Consult base station

### Dyspnea/Wheezing/Shock:

- **Albuterol** 2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 min, repeat as needed
- **Epinephrine 1:1,000** 0.01 mg/kg **IM**, not to exceed 0.3 mg, may repeat every 5 min, not to exceed 3 doses
- **Diphenhydramine** 2 mg/kg IVP/IM, not to exceed 50 mg

### Severe Shock/Extremis:

- **Epinephrine 1:10,000** 0.01 mg/kg (0.1 ml/kg) slow IVP titrated, not to exceed 0.3 mg without base physician order

OR

If patient is in extremis and no IV access, administer:

- **Epinephrine 1:1,000** 0.01 mg/kg **SL** injection, not to exceed 0.3 mg, may repeat every 5 min, not to exceed 3 doses

## BASE PHYSICIAN ORDER ONLY

- **Diphenhydramine** 2 mg/kg IVP/IM for stable patient

# PEDIATRIC ALTERED LEVEL OF CONSCIOUSNESS

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

STABLE

UNSTABLE

## OBERVE/MONITOR

If blood glucose is < 60 mg/dl and patient can self administer:

- **Oral Glucose** 15 Gm (1 tube), repeat as needed

If blood glucose is < 60 mg/dl, administer:

- **Dextrose 25%** 0.5 Gm/kg (2-4 ml/kg) slow IVP over 5 min (see dilution preparation in Drug Formulary)

If blood glucose is < 60 mg/dl and no success with two (2) IV attempts, administer:

- **Glucagon** 0.1 mg/kg IM, not to exceed 1 mg

If narcotic overdose is suspected and respirations are inadequate, administer:

- **Narcan** not to exceed 2 mg initial dose IVP/IM, titrated to maintain adequate respirations

**OR**

If patient is in extremis and no IV access administer:

- **Narcan** 0.4 mg SL injection, titrated to maintain adequate respirations

## BASE PHYSICIAN ORDER ONLY

- **Diazepam** with agitated or combative ALOC patient
- **Charcoal** 1Gm/kg, not to exceed 30 Gm

# PEDIATRIC BRADYCARDIA

- UNIVERSAL ALGORITHM**
- Identify and treat reversible causes
  - Establish vascular access
  - Utilize current Broselow tape
  - Use adult protocols for patients > 34 kg

**STABLE**

**UNSTABLE**

**OBSERVE/MONITOR**

- **Epinephrine 1:10,000** 0.01 mg/kg (0.1 ml/kg) slow IVP/IO, not to exceed 0.3 mg per dose, repeat every 3-5 min

- **Atropine** 0.02 mg/kg IVP/IO, minimum dose of 0.1 mg and a maximum dose of 0.5 mg, may repeat once in 3-5 min, not to exceed 1 mg

- Obtain 12-lead EKG, if available

- BASE PHYSICIAN ORDER ONLY**
- **Dopamine** 5-20 mcg/kg/minute
  - **Sodium Bicarbonate** for tricyclic antidepressant OD
  - **Calcium Chloride** for suspected hyperkalemia, suspected renal failure or calcium channel blocker OD
  - **Glucagon** for beta blocker OD
  - Higher doses of **Atropine** for organophosphate OD
  - **Fluid Bolus** 20 ml/kg NS

# PEDIATRIC HYPOTENSION/SHOCK/MECHANISM OF INJURY

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

**STABLE**

**UNSTABLE**

- **Normal Saline (NS)** establish IV and run TKO

**OBSERVE/MONITOR**

- **Normal Saline (NS)** 20 ml/kg **Fluid Bolus** as rapidly as possible

If no base contact and/or no significant change in BP:

- **Second 20 ml/kg Fluid Bolus** as rapidly as possible

- Consider second IV access

## BASE PHYSICIAN ORDER ONLY

- Additional infusion of NS after 2 fluid challenges
- Early notification for patient in extremis

# PEDIATRIC INTRAVENOUS THERAPY/VASCULAR ACCESS

- UNIVERSAL ALGORITHM**
- Identify and treat reversible causes
  - Establish vascular access as indicated by patient condition
  - Use adult protocols for patients > 34 kg

- Any instance in which the paramedic feels the need for a therapeutic or prophylactic IV (peripheral IV access only)

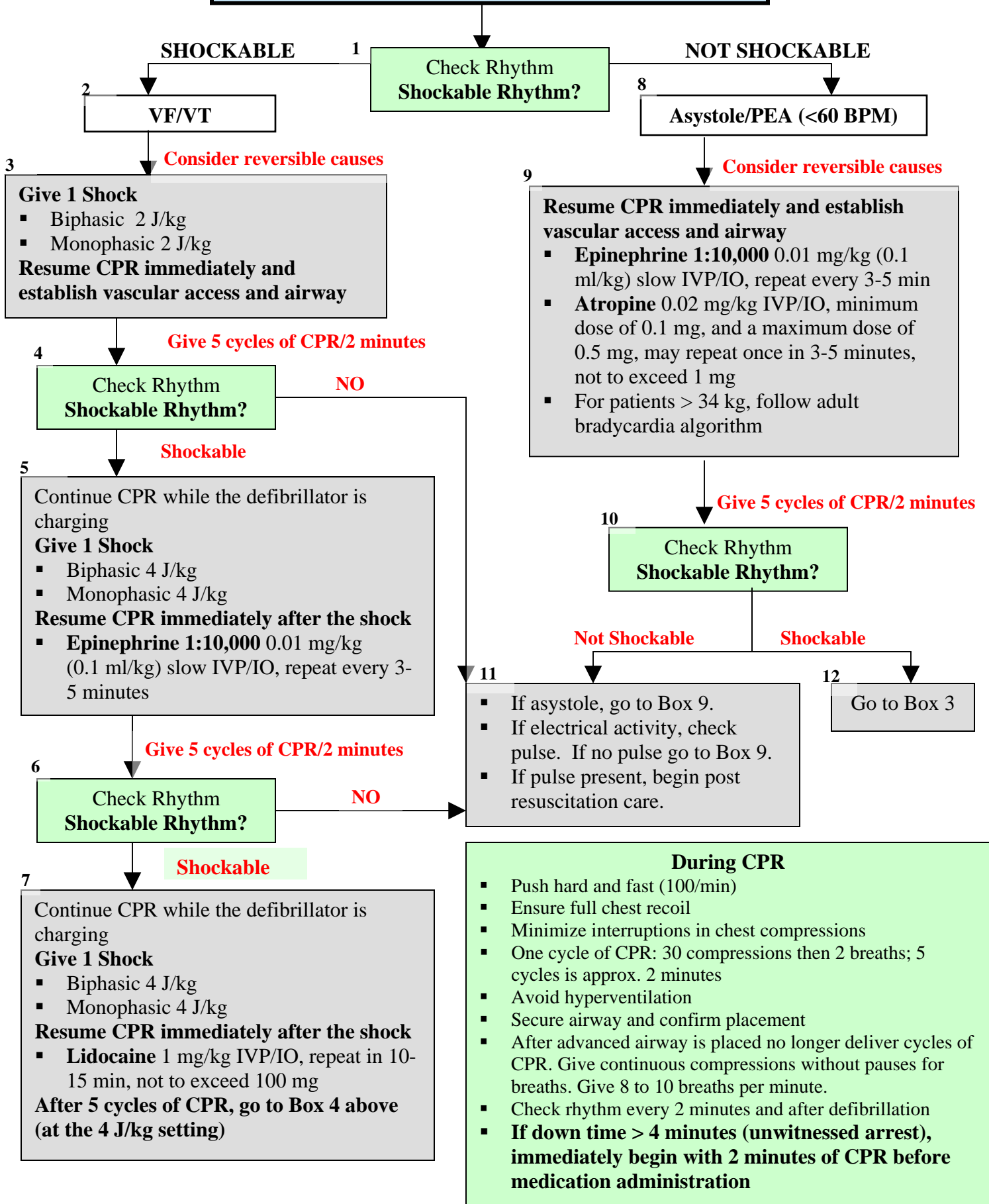
- For lifeline utilize (0.9%) NS TKO or a saline lock

- Consider second IV access

- Consider external jugular IV access for patients in need of IV fluid or medications without obvious peripheral IV sites

- Sublingual (SL) injection of select medications is permissive if patient is in extremis without rapid IV access
- Consider an IM/IO route in patients in extremis and no peripheral IV access

# PEDIATRIC PULSELESS ARREST



**During CPR**

- Push hard and fast (100/min)
- Ensure full chest recoil
- Minimize interruptions in chest compressions
- One cycle of CPR: 30 compressions then 2 breaths; 5 cycles is approx. 2 minutes
- Avoid hyperventilation
- Secure airway and confirm placement
- After advanced airway is placed no longer deliver cycles of CPR. Give continuous compressions without pauses for breaths. Give 8 to 10 breaths per minute.
- Check rhythm every 2 minutes and after defibrillation
- **If down time > 4 minutes (unwitnessed arrest), immediately begin with 2 minutes of CPR before medication administration**

**PEDIATRIC RESPIRATORY DISTRESS**

- UNIVERSAL ALGORITHM**
- Identify and treat reversible causes
  - Establish vascular access
  - Use adult protocols for patients > 34 kg

**STABLE**

**UNSTABLE**

**OBSERVE/MONITOR**

- Dyspnea/Wheezing/Shock:**
- **Albuterol** 2.5-5 mg via HHN/mask/BVM with adjunct over 5-10 min, repeat as needed
  - **Epinephrine 1:1,000** 0.01 mg/kg **IM**, not to exceed 0.3 mg, may repeat every 5 min, not to exceed 3 doses

- Severe Shock/Extremis:**
- **Epinephrine 1:10,000** 0.01 mg/kg (0.1 ml/kg) slow IVP titrated, not to exceed 0.3 mg without base physician order
- OR**
- If patient is in extremis and no IV access, administer:  
**Epinephrine 1:1,000** 0.01 mg/kg **SL** injection, not to exceed 0.3 mg, may repeat every 5 min, not to exceed 3 doses

# PEDIATRIC SUPRAVENTRICULAR TACHYCARDIA

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein
- QRS < 0.08 seconds
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

**STABLE**

**UNSTABLE**

Attempt vagal maneuvers

Consider administration of **Adenosine**

If rhythm and symptoms remain unchanged:

- **Adenosine** 0.1 mg/kg rapid IVP, followed immediately by a 20 cc NS bolus, not to exceed 6 mg
- **Adenosine** 0.2 mg/kg rapid IVP, followed immediately by a 20 cc NS bolus, not to exceed 12 mg
- **Do not repeat**

**SYNCHRONIZED / UNSYNCHRONIZED  
CARDIOVERSION SEQUENCES:**

Consider pre-medication if possible:

- **Diazepam** 0.3 mg/kg slow IVP, not to exceed 10 mg

**MONOPHASIC**

1 J/kg  
2 J/kg  
2 J/kg

**BIPHASIC**

1 J/kg  
2 J/kg  
2 J/kg

## CONSIDERATIONS

- Vascular access may be omitted prior to cardioversion if in extremis.
- If synchronized mode is unable to capture, then use unsynchronized defibrillation.
- Obtain 12-lead EKG, if available, before and after cardioversion.
- Notify base station for wide complex tachycardia (> 0.08 seconds).

# PEDIATRIC VENTRICULAR TACHYCARDIA WITH A PULSE

## UNIVERSAL ALGORITHM

- Identify and treat reversible causes
- Establish vascular access with IV NS in large proximal vein/IO
- QRS > 0.08 seconds
- Utilize current Broselow tape
- Use adult protocols for patients > 34 kg

**STABLE**

**UNSTABLE**

**Lidocaine 1 mg/kg IVP/IO**

**SYNCHRONIZED / UNSYNCHRONIZED  
CARDIOVERSION SEQUENCES:**

If arrhythmia persists:

- Repeat **Lidocaine** 0.5 mg/kg IVP/IO every 5-10 minutes, not to exceed 100 mg

Consider pre-medication if possible:

- **Diazepam** 0.3 mg/kg slow IVP, not to exceed 10 mg

**MONOPHASIC**

1 J/kg  
2 J/kg  
2 J/kg

**BIPHASIC**

1 J/kg  
2 J/kg  
2 J/kg

**Lidocaine 1 mg/kg IVP/IO**

If arrhythmia persists:

- Repeat **Lidocaine** 0.5 mg/kg IVP/IO every 5-10 minutes, not to exceed 100 mg

## CONSIDERATIONS

- Vascular access may be omitted prior to cardioversion if in extremis.
- If synchronized mode is unable to capture, then use unsynchronized defibrillation.
- Obtain 12-lead EKG, if available, before and after cardioversion.
- Notify base station for wide complex tachycardia (> 0.08 seconds).

**Policy Reference No. 631**

**San Luis Obispo County EMS Agency ALS Treatment Protocols 2007**

# PEDIATRIC PAIN MANAGEMENT

## UNIVERSAL ALGORITHM

- Establish vascular access
- Use adult protocols for patients > 34 kg

For acute pain from the following:

- Isolated, single extremity, orthopedic injuries (significant fracture or dislocation only)
- OR**
- Significant burns without multi-system trauma or potential airway compromise

**Morphine** 0.1 mg/kg slow IVP/IM, may repeat once, not to exceed 5 mg

Notify the base physician of the **Morphine** administration

## BASE PHYSICIAN ORDER ONLY

- For other conditions and/or additional **Morphine** administration