| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-1 (LALS) |
|---|---|
| **Non-Traumatic Pulseless Arrest** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

## MANUAL CHEST COMPRESSIONS

- Rate: 100-120/min
- Depth: 2 inches – allow full chest recoil
- Minimize interruptions (≤10 secs)
- Rotate compressors every 2 mins
- Perform CPR during AED/defibrillator charging
- Resume CPR immediately after shock

## MECHANICAL CHEST COMPRESSION DEVICES

**Indications**

- Adult pt (≥15 yo)

**Contraindications**

- Pt does not fit in the device
- 3rd trimester pregnancy

ⓘ Use in accordance with manufacturer indications/ contraindications

ⓘ Apply following completion of at least one manual CPR cycle, or at the end of a subsequent cycle

## DEFIBRILLATION & GENERAL PT MANAGEMENT

- Analyze rhythm/check pulse after every 2 min CPR cycle
- Biphasic manual defibrillation detail **(AEMT II)**:
  - Follow manufacturer recommendations
  - If unknown, start at 200 J (subsequent doses should be equivalent or higher)
- Movement of pt may interrupt CPR or prevent adequate depth and rate of compressions
- Consider resuscitation on scene up to 20 mins
- Go to ROSC protocol (C-2) if ROSC is obtained

## ADVANCED AIRWAY MANAGEMENT

- Consider/establish advanced airway at appropriate time during resuscitation
- Do not interrupt chest compressions to establish an advanced airway
- Waveform capnography (if available) shall be used on all pts with an advanced airway in place
  - An abrupt increase in $PETCO_2$ is indicative of ROSC
  - Persistently low $PETCO_2$ levels (<10 mmHG) suggest ROSC is unlikely

## TREAT REVERSIBLE CAUSES

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen Ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis, pulmonary
- **T**hrombosis, cardiac
- **T**oxins

ⓘ Refer to Hypothermia & Avalanche/Snow Immersion Suffocation Resuscitation Protocol (E-2 - LALS) or Traumatic Pulseless Arrest Protocol (T-6 – LALS) as appropriate

ⓘ Contact the base/modified base hospital for consultation & orders as appropriate

ⓘ Consider early transport of pts who have reversible causes that cannot be adequately treated in the prehospital setting

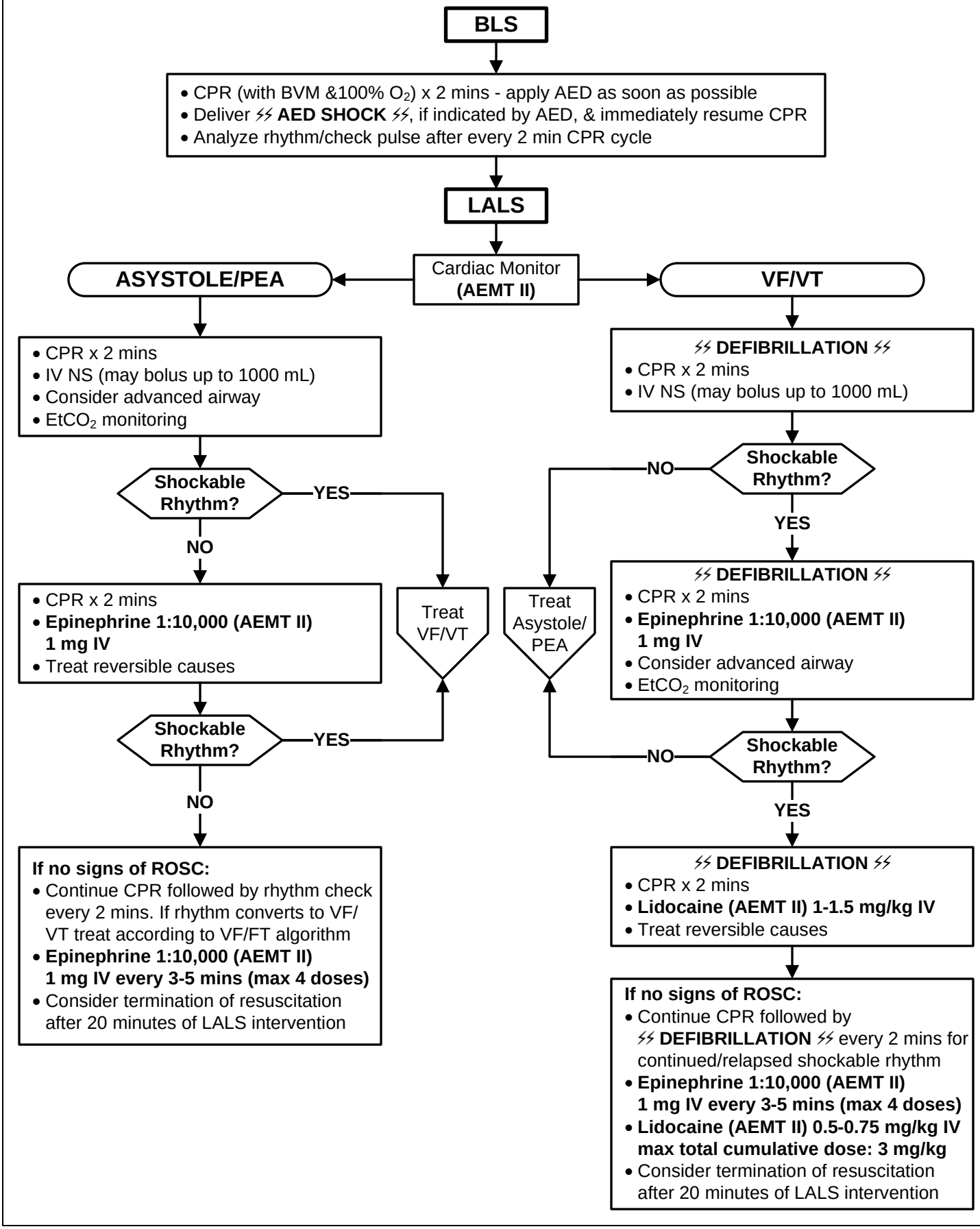
## TERMINATION OF RESUSCITATION

**Base/Modified Base Hospital Physician Order****

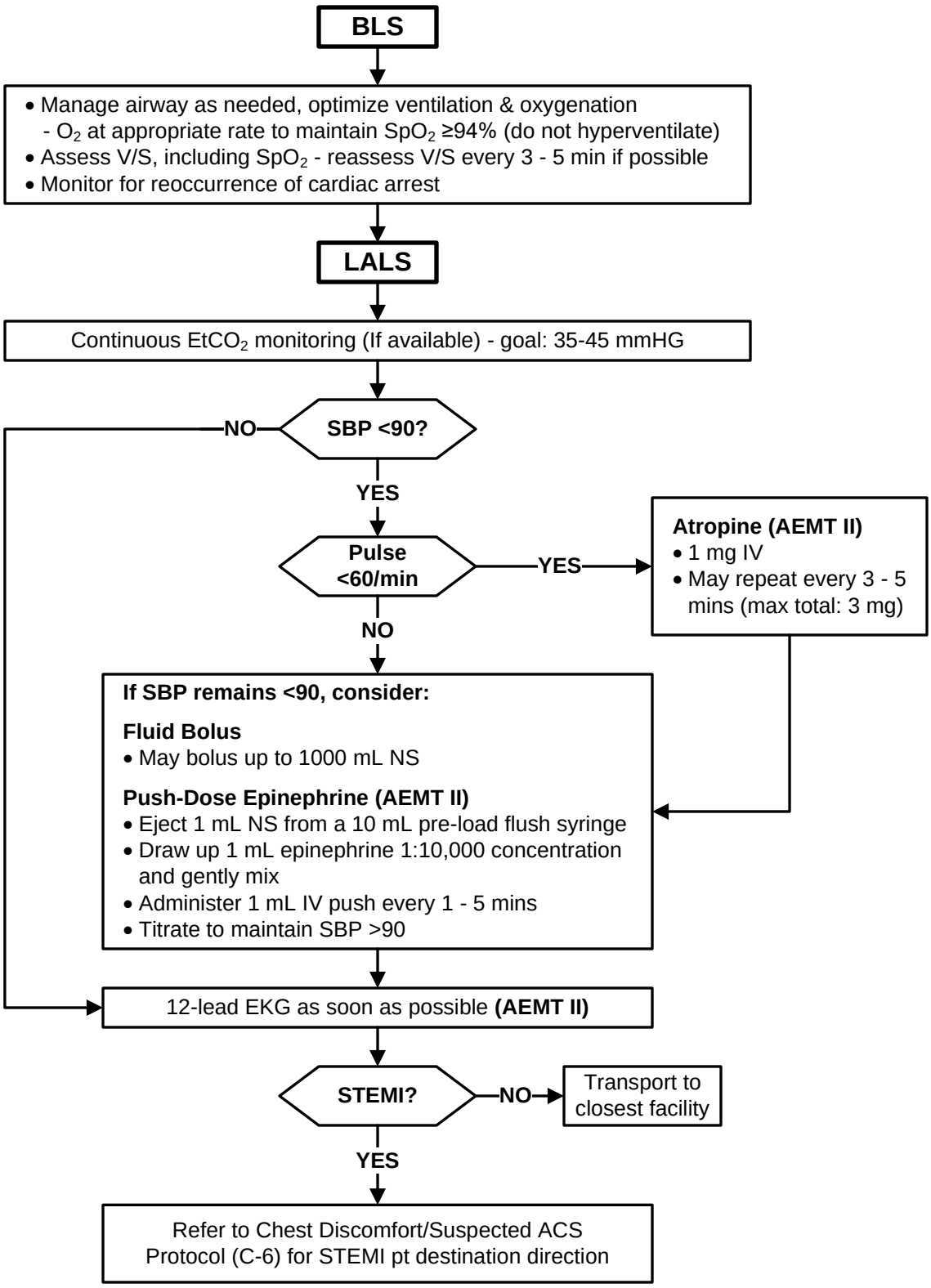
- If resuscitation attempts do not obtain ROSC, consider termination of resuscitation efforts
- BLS termination of resuscitation criteria (all):
  (1) Arrest not witnessed by EMS
  (2) No AED shocks delivered
  (3) No ROSC after 3 rounds of CPR/AED analysis
- LALS Termination of Resuscitation Criteria (all):
  (1) Arrest not witnessed by EMS
  (2) No effective bystander CPR was provided, or effective CPR cannot be maintained
  (3) No AED shocks or defibrillations delivered
  (4) No ROSC after full ALS care

**In the event of communication failure, EMS personnel may terminate resuscitation without a base/modified base hospital physician order on a pt who meets LALS termination of resuscitation criteria.

**SEE PAGE 2 FOR TREATMENT ALGORITHM**

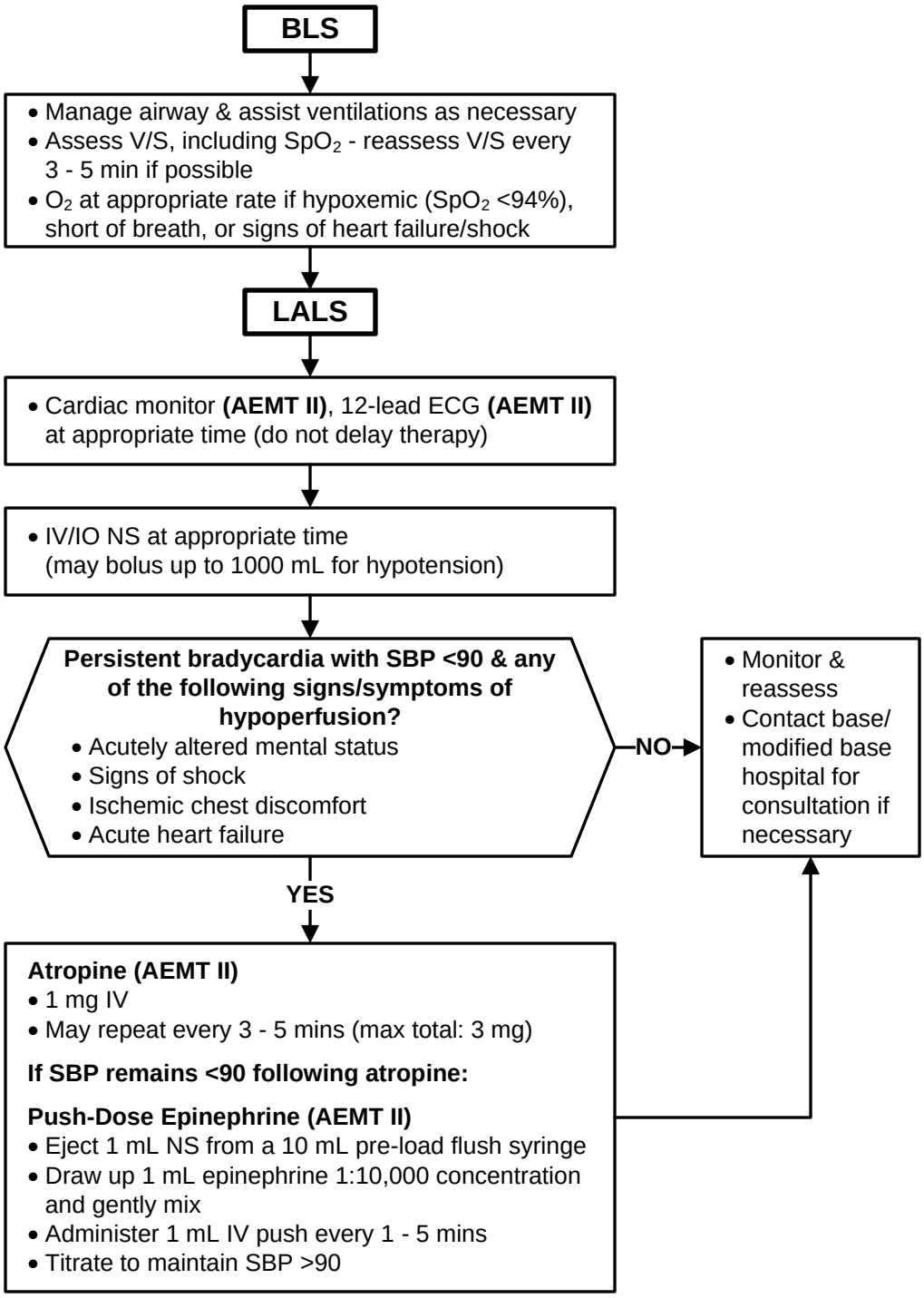

BLS
• CPR (with BVM &100% $O_2$) x 2 mins - apply AED as soon as possible
• Deliver ⚡⚡ AED SHOCK ⚡⚡, if indicated by AED, & immediately resume CPR
• Analyze rhythm/check pulse after every 2 min CPR cycle
LALS
Cardiac Monitor (AEMT II)
ASYSTOLE/PEA
VF/VT
• CPR x 2 mins
• IV NS (may bolus up to 1000 mL)
• Consider advanced airway
• $EtCO_2$ monitoring
Shockable Rhythm?
YES
NO
• CPR x 2 mins
• Epinephrine 1:10,000 (AEMT II) 1 mg IV
• Treat reversible causes
Shockable Rhythm?
YES
NO
If no signs of ROSC:
• Continue CPR followed by rhythm check every 2 mins. If rhythm converts to VF/VT treat according to VF/FT algorithm
• Epinephrine 1:10,000 (AEMT II) 1 mg IV every 3-5 mins (max 4 doses)
• Consider termination of resuscitation after 20 minutes of LALS intervention
Treat VF/VT
⚡⚡ DEFIBRILLATION ⚡⚡
• CPR x 2 mins
• IV NS (may bolus up to 1000 mL)
Shockable Rhythm?
NO
YES
Treat Asystole/ PEA
⚡⚡ DEFIBRILLATION ⚡⚡
• CPR x 2 mins
• Epinephrine 1:10,000 (AEMT II) 1 mg IV
• Consider advanced airway
• $EtCO_2$ monitoring
Shockable Rhythm?
NO
YES
⚡⚡ DEFIBRILLATION ⚡⚡
• CPR x 2 mins
• Lidocaine (AEMT II) 1-1.5 mg/kg IV
• Treat reversible causes
If no signs of ROSC:
• Continue CPR followed by ⚡⚡ DEFIBRILLATION ⚡⚡ every 2 mins for continued/relapsed shockable rhythm
• Epinephrine 1:10,000 (AEMT II) 1 mg IV every 3-5 mins (max 4 doses)
• Lidocaine (AEMT II) 0.5-0.75 mg/kg IV max total cumulative dose: 3 mg/kg
• Consider termination of resuscitation after 20 minutes of LALS intervention

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-2 (LALS) |
|---|---|
| **Return Of Spontaneous Circulation (ROSC)** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-3 (LALS) |
|---|---|
| **Bradycardia With Pulses** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Symptomatic bradycardia exists clinically when the following 3 criteria are present: 1) The HR is slow (<60/min), 2) The pt has symptoms & 3) The symptoms are due to the slow HR.**
- **Bradycardia that causes symptoms is typically <50/min. The pts cardiac rhythm should be interpreted in the context of symptoms, & atropine utilized only for symptomatic bradycardia.**



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-4 (LALS) |
|---|---|
| **Tachycardia With Pulses** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Unstable pts with persistent tachycardia require immediate cardioversion (AEMT II).**
- **It is unlikely that symptoms of instability are caused primarily by the tachycardia if the HR is <150/min.**

**BLS**

- Manage airway and assist ventilations as necessary
- Assess V/S, including $SpO_2$ - reassess V/S every 3 - 5 min if possible
- $O_2$ at appropriate rate if hypoxemic ($SpO_2$ <94%), short of breath, or signs of heart failure/shock

**LALS**

- Cardiac monitor **(AEMT II)**, 12-lead ECG **(AEMT II)** at appropriate time (do not delay therapy)
- IV/IO NS at appropriate time (may bolus up to 1000 mL for hypotension)

**Persistent tachycardia causing any of the following?**

- Hypotension
- Acutely altered mental status
- Signs of shock
- Ischemic chest discomfort
- Acute heart failure

**NO** →
- Monitor & reassess
- Contact base/ modified base hospital for consultation if necessary

**YES**

**Synchronized Cardioversion (AEMT II)**

- Initial synchronized cardioversion doses:
  - Narrow regular: 50 - 100 J
  - Narrow irregular: 120 - 200 J
  - Wide regular: 100 J
- Consider pre-cardioversion sedation/pain control*
- If no response to initial shock, increase dose in a stepwise fashion for subsequent attempts
- If rhythm is wide-irregular or monitor will not synchronize, & pt is critical, treat as VF with unsynchronized defibrillation doses (protocol C-1)

***Sedation/Pain Control (AEMT II)**

Consider one of the following for pts in need of sedation/pain control:

**Midazolam:**
- 2 - 5 mg IV

**OR**

**Fentanyl:**
- 25 - 50 mcg IV

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-6 (LALS) |
|---|---|
| **Chest Discomfort/Suspected Acute Coronary Syndrome (ACS)** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Common symptoms associated with ACS include, but are not limited to:**
  - **Dyspnea/SOB**
  - **Palpitations**
  - **Diaphoresis**
  - **Nausea/vomiting**
  - **Lightheadedness/near-syncope/syncope**
  - **Upper abdominal pain or heartburn unrelated to meals**
  - **Discomfort in the throat or abdomen may occur in pts with diabetes, women and elderly pts**
- **Fleeting or sharp chest pain that increases with inspiration & lying supine is unlikely to be ACS related.**
- **Pt assessment, treatment & transport destination determination should occur concurrently.**

## BLS

- Assess V/S, including $SpO_2$
- $O_2$ at appropriate rate if hypoxemic ($SpO_2$ <94%), short of breath, or signs of heart failure or shock
- P-Q-R-S-T

**Aspirin**
- 160 - 325 mg chewable PO (anticoagulant use is not a contraindication to administration)

## LALS

- Cardiac monitor **(AEMT II)**
- 12-lead EKG as soon as possible **(AEMT II)** - prior to nitroglycerin administration
  - Criteria for ST Elevation Myocardial Infarction (STEMI):
    1. Machine readout: 'Meets ST Elevation MI Criteria', 'Acute MI', 'STEMI' (or equivalent)
    2. ST elevation in 2 or more contiguous leads
  - For pts with suspected ACS, serial 12-lead EKGs should be obtained if the pt's clinical status changes or if EKG changes are noted on the monitor, and every 15 mins if transport times are long

- IV at appropriate time during treatment
  - Administer 250 mL NS fluid boluses to maintain SBP >90
  - Do not administer fluid if signs of heart failure

**If discomfort persists following initial 12-lead acquisition:**

**Nitroglycerin**
- 0.4 mg SL (tablet or spray), repeat every 5 mins if discomfort persists
- Do not administer if SBP <100,
- Use with caution for pts with suspected inferior MI (establish vascular access prior to administration)
- Consult with base/modified base hospital prior to administration if pt takes erectile dysfunction or pulmonary hypertension medication

**SEE PAGE 2 FOR ADDITIONAL LALS TREATMENT & PT DESTINATION**

## ADDITIONAL LALS TREATMENT & PT DESTINATION

**If discomfort persists following one or more EMS administered nitroglycerine doses:**

**Fentanyl (AEMT II)**
- 25 mcg slow IV
- May repeat every 5 mins if discomfort persists (maximum cumulative dose: 200 mcg)

ⓘ Do not administer fentanyl to pts with any of the following contraindications:
- Systolic BP <100 - Hypoxia or RR <12 - ALOC or evidence of head injury

**STEMI Criteria Met?**
- NO → **Transport to Closest Facility**
- YES ↓

**Both STEMI Criteria Met?**
- NO → **Contact closest facility for destination consultation**
  - Transmit 12-lead to closest facility if able
- YES ↓

**≤45 min to STEMI Receiving Center (SRC)**
- NO → **Contact closest facility for destination consultation**
  - Transmit 12-lead to closest facility if able
- YES ↓

**Any of the following criteria met?**
- CPR in progress
- Unmanageable airway
- Unstable v-tach

- YES → **Contact closest facility for destination consultation**
  - Transmit 12-lead to closest facility if able
- NO ↓

**Transport Directly to SRC**
- Transmit 12-lead to SRC if able
- Advise SRC of "STEMI ALERT"

**STEMI Pt Notes**

- When possible, any 12-lead meeting STEMI criteria shall be transmitted within 10 mins of first STEMI positive 12-lead.
- Scene time for STEMI pts should be ≤10 mins.
- When possible, obtain & relay to the receiving hospital the name/contact information of an individual who can make decisions on behalf of the pt.
- Always relay pertinent medical directives (DNR, POLST, etc.) to the receiving hospital.

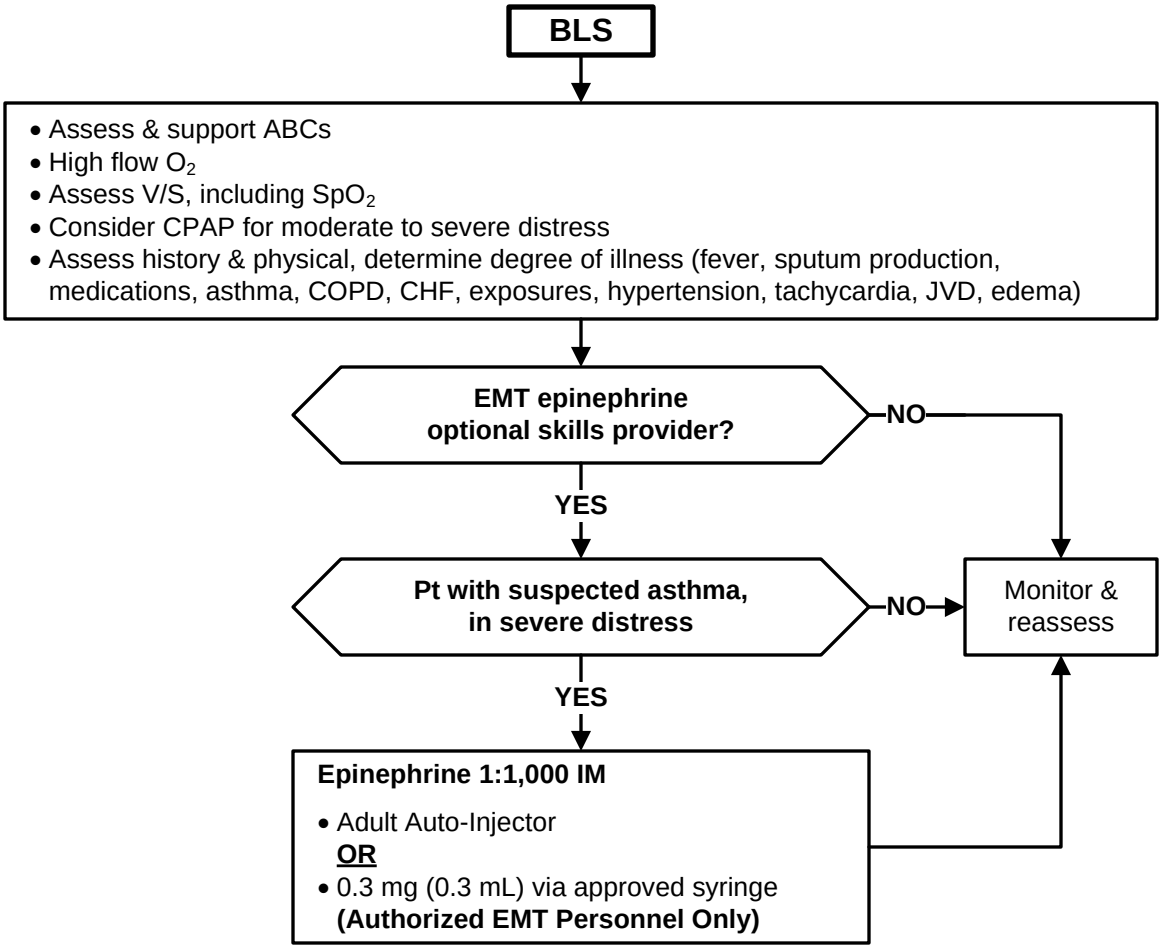
| Sierra – Sacramento Valley EMS Agency Treatment Protocol | R-3 (LALS) |
|---|---|
| **Acute Respiratory Distress** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

## Continuous Positive Airway Pressure (CPAP) Utilization

- **Indications:**
  - CHF with pulmonary edema
  - Moderate to severe respiratory distress
  - Near drowning
- **Contraindications:**
  - <8 years of age
  - Respiratory or cardiac arrest
  - Severe decreased LOC
  - Agonal respirations
  - Inability to maintain airway
  - Suspected pneumothorax
  - SBP <90
  - Major trauma, especially head injury or significant chest trauma
- **Complications:**
  - Hypotension
  - Pneumothorax
  - Corneal drying

## Epinephrine Administration

- Epinephrine is only indicated for pts with suspected asthma who are in severe distress.
- **Use epinephrine cautiously in pts >35yo, or with a history of coronary artery disease or hypertension.**
- Administer Auto-Injector/IM epinephrine into the lateral thigh, midway between waist & knee.




**SEE PAGE 2 FOR LALS TREATMENT**

# Acute Respiratory Distress

**Asthma/COPD**

**LALS**

**Mild Distress**
- Mild wheezing
- Mild shortness of breath
- Cough

- Cardiac monitor **(AEMT II)**
- Consider IV NS (may bolus up to 1000 mL)

**Albuterol 5 mg**
- Nebulizer
- May repeat 2.5-5 mg for continued respiratory distress

**Moderate to Severe Distress**
- Cyanosis
- Accessory muscle use
- Inability to speak >3 words
- Severe wheezing/shortness of breath
- Decreased or absent air movement

- Cardiac monitor **(AEMT II)**
- IV NS (may bolus up to 1000 mL)

**Albuterol 5 mg**
- Nebulizer/CPAP/BVM
- May repeat 2.5-5 mg for continued respiratory distress

**History of asthma with severe distress only**

**Epinephrine 1:1,000**
- 0.01 mg/kg IM (max: 0.5 mg)

**CHF/Pulmonary Edema**

**LALS**

**Mild Signs & Symptoms**

- Cardiac monitor **(AEMT II)**
- IV NS TKO

***Nitroglycerin**
- 0.4 mg SL
- May repeat every 5 mins

***Nitroglycerin Notes/Precautions**
- Do not administer if SBP <100
- Do not delay due to difficult vascular access
- Consult with base/modified base hospital prior to administration to pts taking erectile dysfunction or pulmonary HTN medication

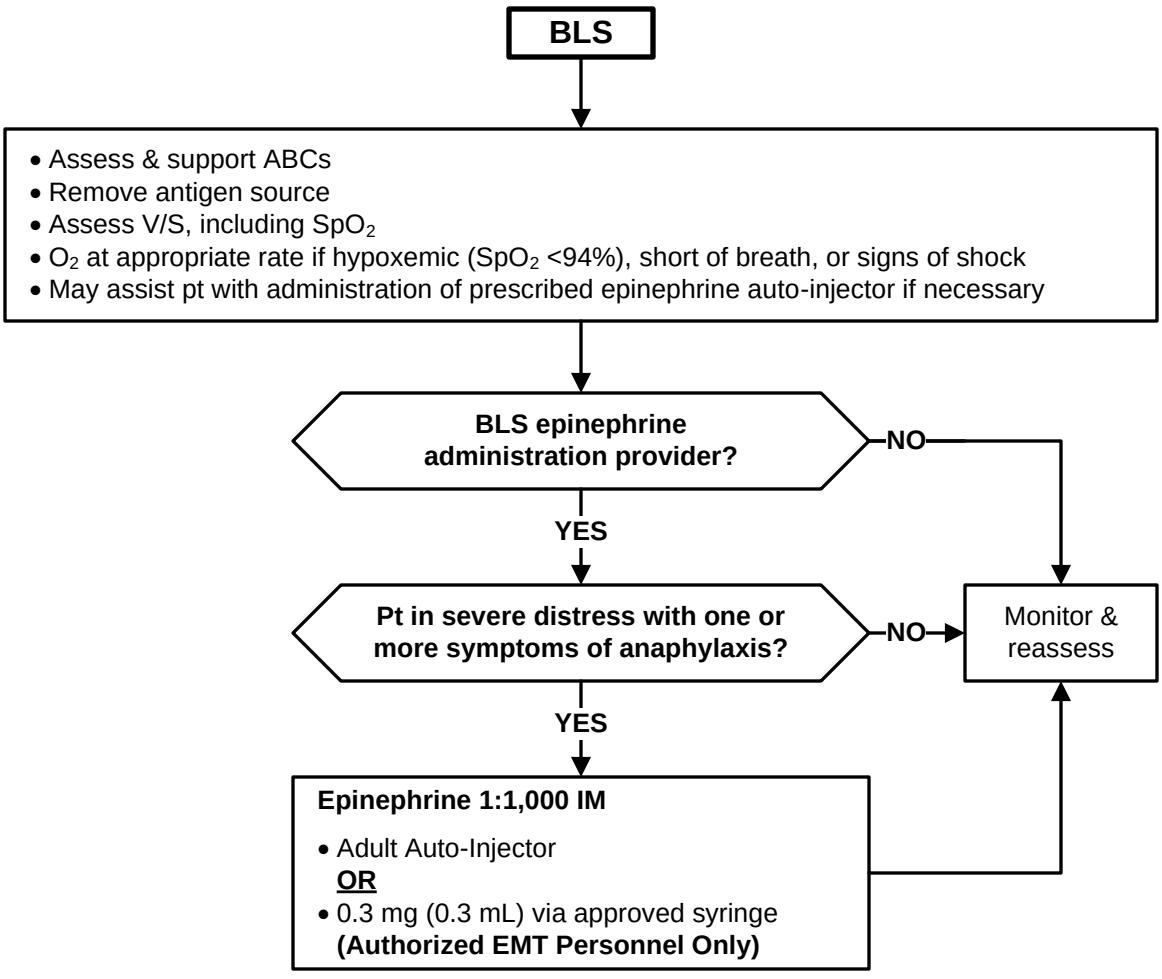
**Moderate to Severe Signs & Symptoms**

- Cardiac monitor **(AEMT II)**
- Assess BP x 2 to confirm accuracy
- IV NS TKO

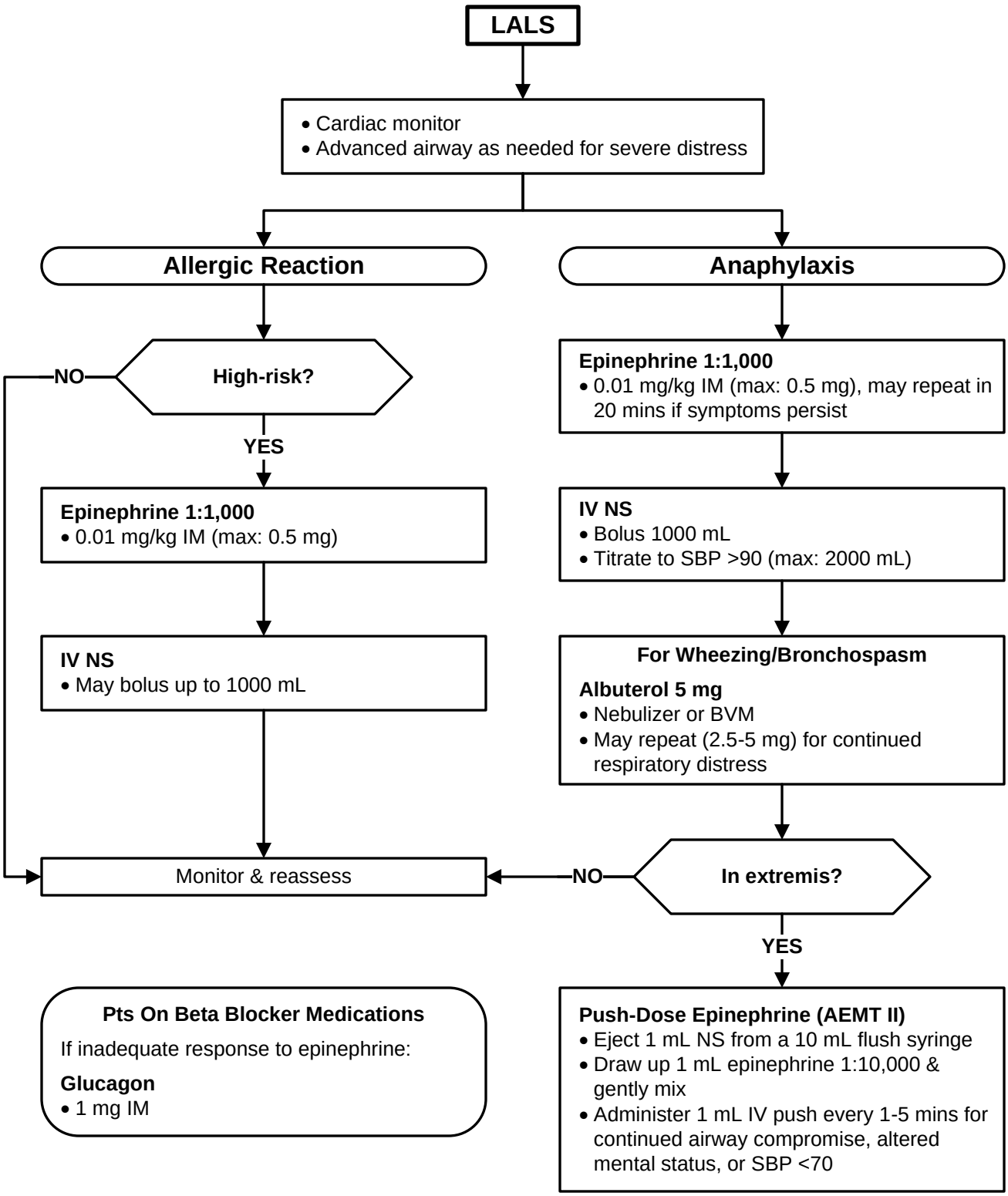
***Nitroglycerin: titrate dose based on SBP**
- SBP 100-150: 0.4 mg SL
- SBP 150-200: 0.8 mg SL
- SBP >200: 1.2 mg SL
- May repeat titrated doses every 5 mins based on repeat SBP

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-1 (LALS) |
|---|---|
| **Allergic Reaction/Anaphylaxis** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Allergic reaction:** Sensitivity to an allergen causing hives, pruritus, flushing, rash, nasal congestion, watery eyes, &/or angioedema not involving the airway.
- **High-risk allergic reaction:** Allergic reaction with a history of anaphylaxis, or significant exposure with worsening symptoms.
- **Anaphylaxis:** Severe allergic reaction with one or more of the following: respiratory distress, bronchospasm, wheezes, diminished breath sounds, hoarseness, stridor, edema involving the airway, hypotension (SBP <90).
- **In extremis:** Anaphylaxis with one or more of the following: airway compromise, altered mental status, SBP <70.
- **Use epinephrine cautiously in pts >35yo, or with a history of coronary artery disease or hypertension.**
- Administer Auto-Injector/IM epinephrine into the lateral thigh, midway between waist & knee.




**SEE PAGE 2 FOR LALS TREATMENT**


LALS
• Cardiac monitor
• Advanced airway as needed for severe distress
Allergic Reaction
Anaphylaxis
NO
High-risk?
YES
Epinephrine 1:1,000
• 0.01 mg/kg IM (max: 0.5 mg)
IV NS
• May bolus up to 1000 mL
Epinephrine 1:1,000
• 0.01 mg/kg IM (max: 0.5 mg), may repeat in 20 mins if symptoms persist
IV NS
• Bolus 1000 mL
• Titrate to SBP >90 (max: 2000 mL)
For Wheezing/Bronchospasm
Albuterol 5 mg
• Nebulizer or BVM
• May repeat (2.5-5 mg) for continued respiratory distress
Monitor & reassess
NO
In extremis?
YES
Pts On Beta Blocker Medications
If inadequate response to epinephrine:
Glucagon
• 1 mg IM
Push-Dose Epinephrine (AEMT II)
• Eject 1 mL NS from a 10 mL flush syringe
• Draw up 1 mL epinephrine 1:10,000 & gently mix
• Administer 1 mL IV push every 1-5 mins for continued airway compromise, altered mental status, or SBP <70

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-6 (LALS) |
|---|---|
| **General Medical Treatment** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- The purpose of this protocol is to provide standing order assessment and treatment modalities for pt complaints not addressed by other S-SV EMS treatment protocols – including nausea/vomiting and suspected sepsis.

**BLS**

- Assess V/S, including $SpO_2$ & temperature (if able)
- $O_2$ at appropriate rate if pt hypoxemic ($SpO_2$ <94%), short of breath, or has signs of heart failure/shock
- Assess history & physical
- Check blood glucose – if indicated & able

**Blood glucose ≤60 mg/dl, or hx & clinical presentation fits hypoglycemia**

**NO**

**YES**

**Oral glucose (BLS) – ONLY if pt is conscious & able to swallow**
- Pre-packaged glucose solution/gel or 2-3 tbsp of sugar in water/juice

**OR**

**Dextrose 10% (LALS)**
- 10 – 25 g (100 – 250 mL) IV

**OR**

**Glucagon (LALS)**
- 1 mg (1 unit) IM/IN

**LALS**

Consider the following additional assessment/treatment modalities, as appropriate based on pt's condition & clinical presentation

- Cardiac monitor/12-lead EKG **(AEMT II)**
- $EtCO_2$ monitoring **(AEMT II)**
- IV NS (may bolus up to 1000 mL if indicated)

**See Page 2 for Suspected Sepsis assessment/treatment details if appropriate**

# Suspected Sepsis

- Early recognition of sepsis is critical to expedite hospital care and antibiotic administration.
- Aggressive IV fluid therapy is the most important prehospital treatment for sepsis.
- Septic pts are especially susceptible to traumatic lung injury and ARDS. If BVM ventilation is necessary, avoid excessive tidal volumes.
- Attempt to identify the source of infection (skin, respiratory, etc.), previous treatment and related history.
- Consider the possibility of sepsis when a combination of two or more of the following Systemic Inflammatory Response Syndrome (SIRS) criteria are present:
  - Temperature <96.8°F or >100.4°F
  - RR >20bpm
  - HR >90bpm
  - ETCO2 ≤25 mmHg

**High-Risk Indicators for Sepsis:**

- Hx of pneumonia, UTI, MRSA
- Cancer pts
- Nursing home residents
- Pts with indwelling catheters
- Immune-compromised pts

**Shock Index (SI):**

- SI is used to assess the severity of hypovolemic shock
- SI = HR/SBP
  - Normal SI range is 0.5 to 0.7
  - HR>SBP (SI>1) may indicate sepsis

**LALS**

- Assess Temperature
- $EtCO_2$ monitoring **(AEMT II)**
- IV NS 500 mL boluses to a maximum of 2 L if SIRS criteria remain present
  - Reassess vital signs between boluses
  - Discontinue boluses and provide supportive care if signs of pulmonary edema develop

If SBP <90 after 2 L NS:
**Push-Dose Epinephrine**

- Eject 1 mL NS from a 10 mL flush syringe
- Draw up 1 mL epinephrine 1:10,000 & gently mix
- Administer 1 mL IV push every 1-5 mins for continued SBP <90

- Monitor & reassess
- Provide early notification to the receiving hospital for suspected sepsis pts

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-8 (LALS) |
|---|---|
| **Pain Management** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- All pts with a report of pain shall be appropriately assessed and treatment decisions/interventions shall be adequately documented on the PCR.
- A variety of pharmacological and non-pharmacological interventions may be utilized to treat pain. Consider the pt's hemodynamic status, age, and previous medical history/medications when choosing analgesic interventions.
- Treatment goals should be directed at reducing pain to a tolerable level; pts may not experience complete pain relief.

**BLS**

- Assess V/S including pain scale & $SpO_2$, every 15 mins or as indicated by pt's clinical condition
- Assess/document pain score using standard 1-10 pain scale before and after each pain management intervention and at a minimum of every 15 mins
- $O_2$ at appropriate rate if $SpO_2$ <94% or pt is short of breath
- Utilize non-pharmacological pain management techniques as appropriate, including:
  - Place in position of comfort and provide verbal reassurance to minimize anxiety
  - Apply ice packs &/or splints for pain secondary to trauma

**Pain not effectively managed with non-pharmaceutical pain management techniques**

**Pain related to acute injury/ burns/frostbite?**

**NO** →
- Contact base/modified base hosp. for pain management consultation
- May proceed with LALS treatment in the event of communication failure, if indicated by pt's condition

**YES**

**LALS**

- Continuous cardiac & EtCO2 monitoring if administering fentanyl &/or midazolam
- IV/IO NS TKO – if indicated by pt's clinical condition or necessary for medication administration
  - May bolus up to 1000 mL if indicated by pt's clinical condition

**Fentanyl (AEMT II):** 25-50 mcg slow IV or IM/IN – may repeat every 5 mins to max cumulative dose of 200 mcg

**Pts with severe pain from acute isolated extremity injuries (including hip & shoulder), not adequately relieved by other methods/analgesics:**

**Midazolam (AEMT II):** 1 mg slow IV – may repeat in 5 mins to max cumulative dose of 2 mg

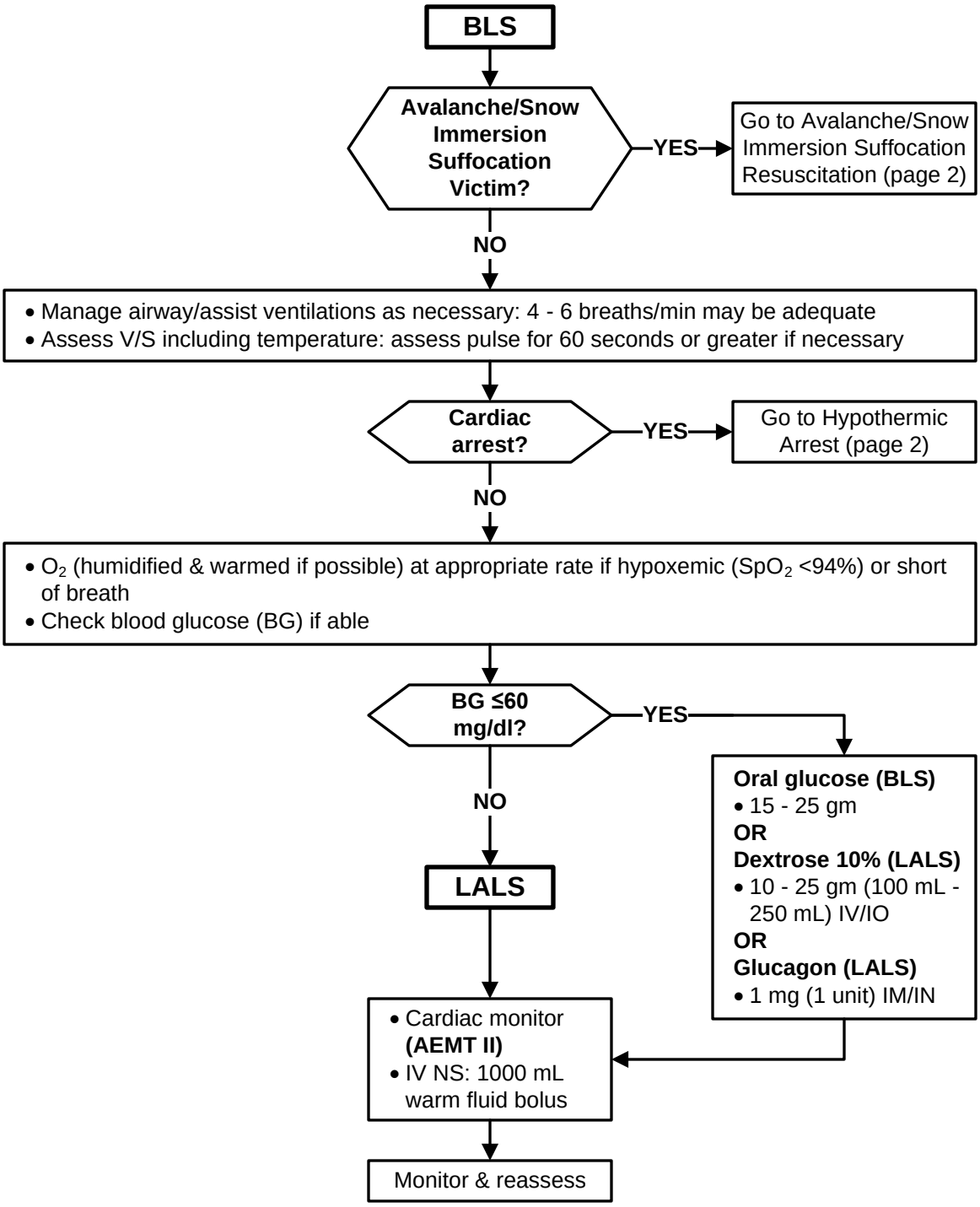
## Fentanyl/Midazolam Contraindications & Administration Notes

ⓘ Administer fentanyl/midazolam IV doses over 60 seconds
ⓘ Do not administer fentanyl/midazolam to pts with any of the following:
- SBP <100 - SpO2 <94% or RR <12 - ALOC or suspected moderate/severe TBI

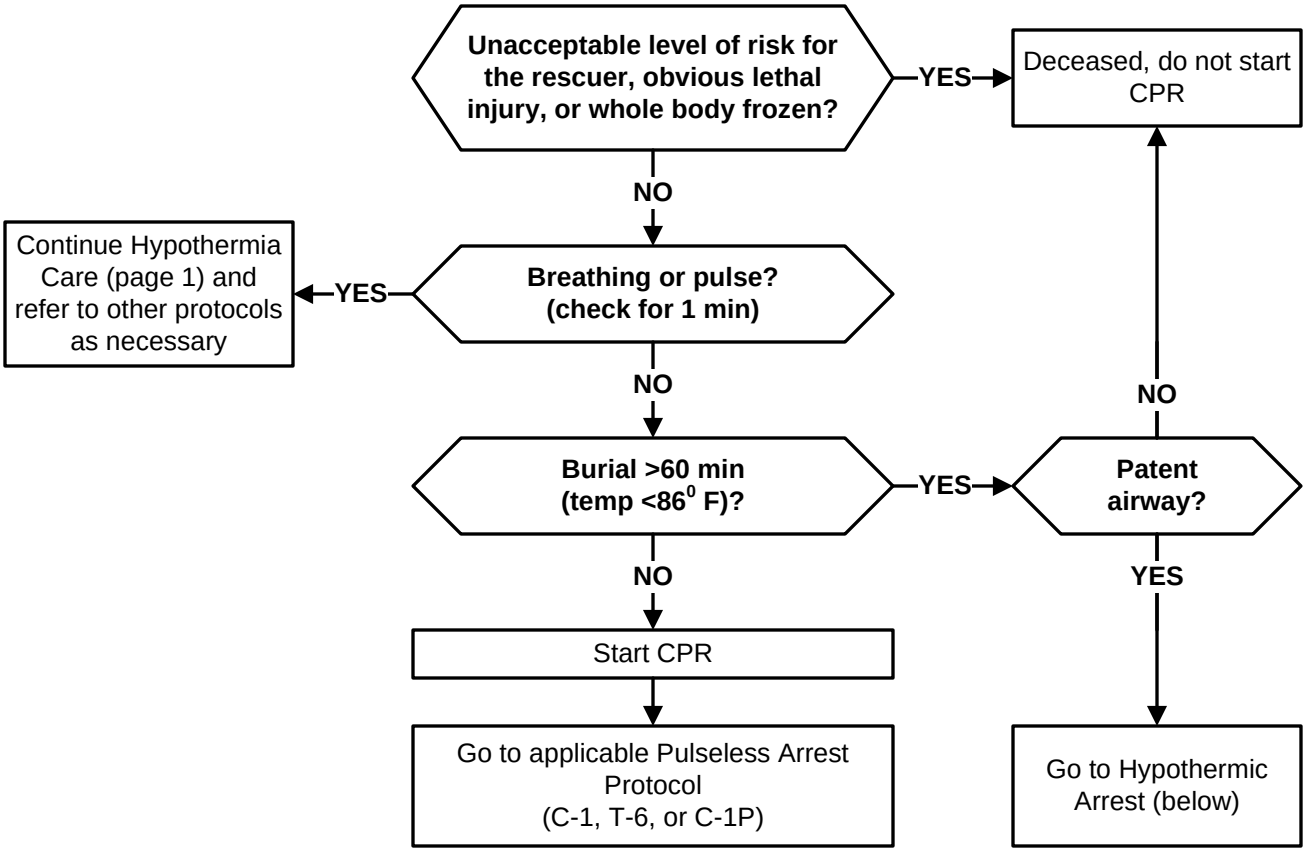
ⓘ Do not administer midazolam to pts ≥65 yo
ⓘ Reduce fentanyl doses to 25 mcg for pts ≥65 yo
ⓘ There is an increased risk of deeper level of sedation & airway/respiratory compromise when administering midazolam to pts receiving fentanyl

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | E-2 (LALS) |
|---|---|
| **Hypothermia & Avalanche/Snow Immersion Suffocation Resuscitation** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 12/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Move pt to a warm environment, remove wet clothing, begin warming measures as soon as possible.**
- **Moderately & severely hypothermic pts should be handled as gently as possible.**
- **This protocol incorporates the official guidelines for the onsite treatment of avalanche victims established by the International Commission for Alpine Rescue (ICAR).**



## Avalanche/Snow Immersion Suffocation Resuscitation




## Hypothermic Arrest

- **Medications & defibrillation may be ineffective in a hypothermic cardiac arrest pt. If the pt is in v-fib, one shock & one round of medications should be delivered. It is reasonable to delay further defibrillation attempts & further medications until the pt is rewarmed.**
- **Continuing CPR & safe expedited transport to the nearest facility is the pt's best chance at survival.**

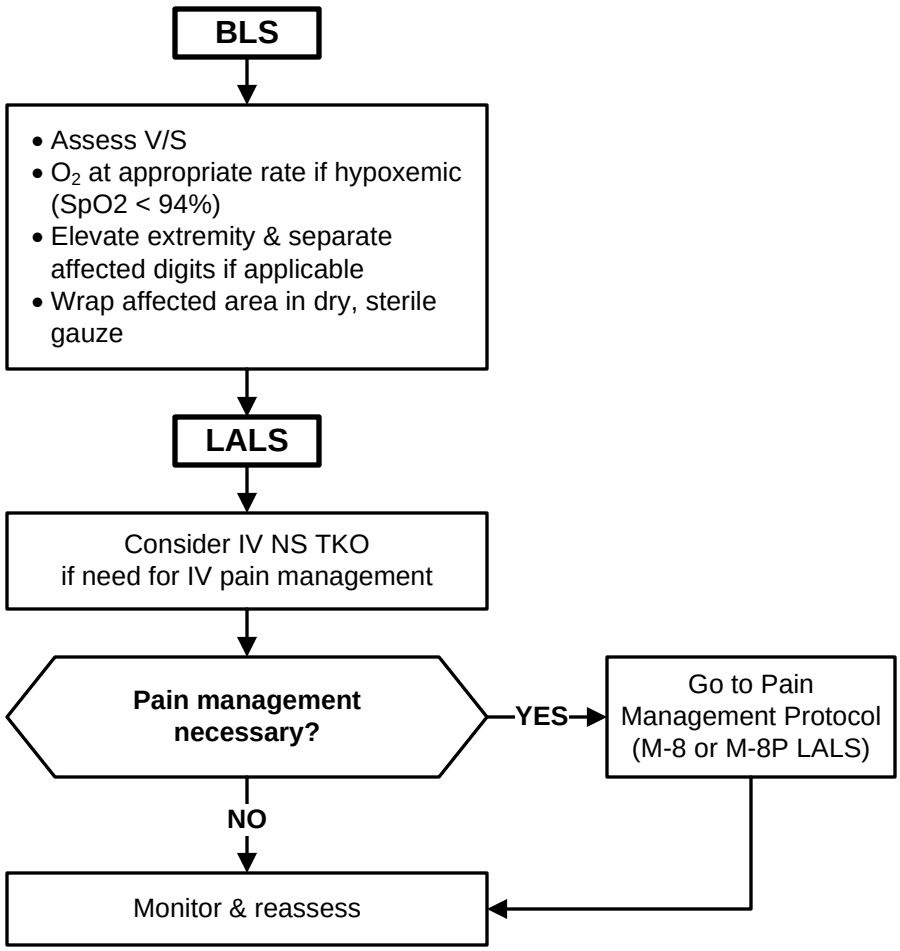
**BLS**

Begin CPR & apply AED as soon as possible, deliver one AED shock if indicated

**LALS**

- If indicated according to Pulseless Arrest protocol (C-1, T-6, or C-1P), administer one manual defibrillation **(AEMT II)** & one round of ALS medications **(AEMT II)**
- Evacuate/transport as soon as possible - continue CPR until ROSC, rescuer exhaustion, hospital arrival, or base/modified base hospital order to terminate resuscitation efforts

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | E-3 (LALS) |
|---|---|
| **Frostbite** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | E-4 (LALS) |
|---|---|
| **Bites/Envenomations** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

## Important Caveats

### General

- Ensure the scene is safe. Attempt to identify what type of animal/reptile/insect the bite or sting is from (transport with the pt is not recommended). If safe to do so, a digital photograph is preferred for identification purposes (include the head, tail & any distinctive markings). Avoid the head & fangs of pit vipers as they are capable of envenomation even when dead.
- Venomous & mammal bites to the face, tongue, mouth & neck or direct stings to the tongue & mouth are imminent airway emergencies & will need to be addressed early.

### Spider/Centipede Bites or Bee/Wasp/Scorpion/Ant Stings

- Bites from brown recluse, hobo & other spiders in the sicariidae family may cause a painless bite with tissue necrosis & clotting disorders developing over several days with little to no immediate symptoms. Brown recluse spiders are not native to California & are very rare. There is no current antivenom for this class of spider.
- Black widow spider bites cause diaphoresis, severe cramping & pain in the abdomen, groin, back & legs.
- Scorpion stings may cause pain & red welt at the sting site as well as uncontrolled muscle jerking, pain, eye twitching, hypotension & increased salivation.
- While very rare, severe reactions to black widow spider bites & some scorpion stings may require antivenom.
- Centipede bites may cause pain, minor bleeding & red welt at the sting site. First aid treatment is usually sufficient.
- Bee, wasp & ant stings may cause pain, minor bleeding & red welt at the sting site. First aid treatment is usually sufficient. Pts with history of reaction or who have multiple stings are at higher risk for anaphylaxis.

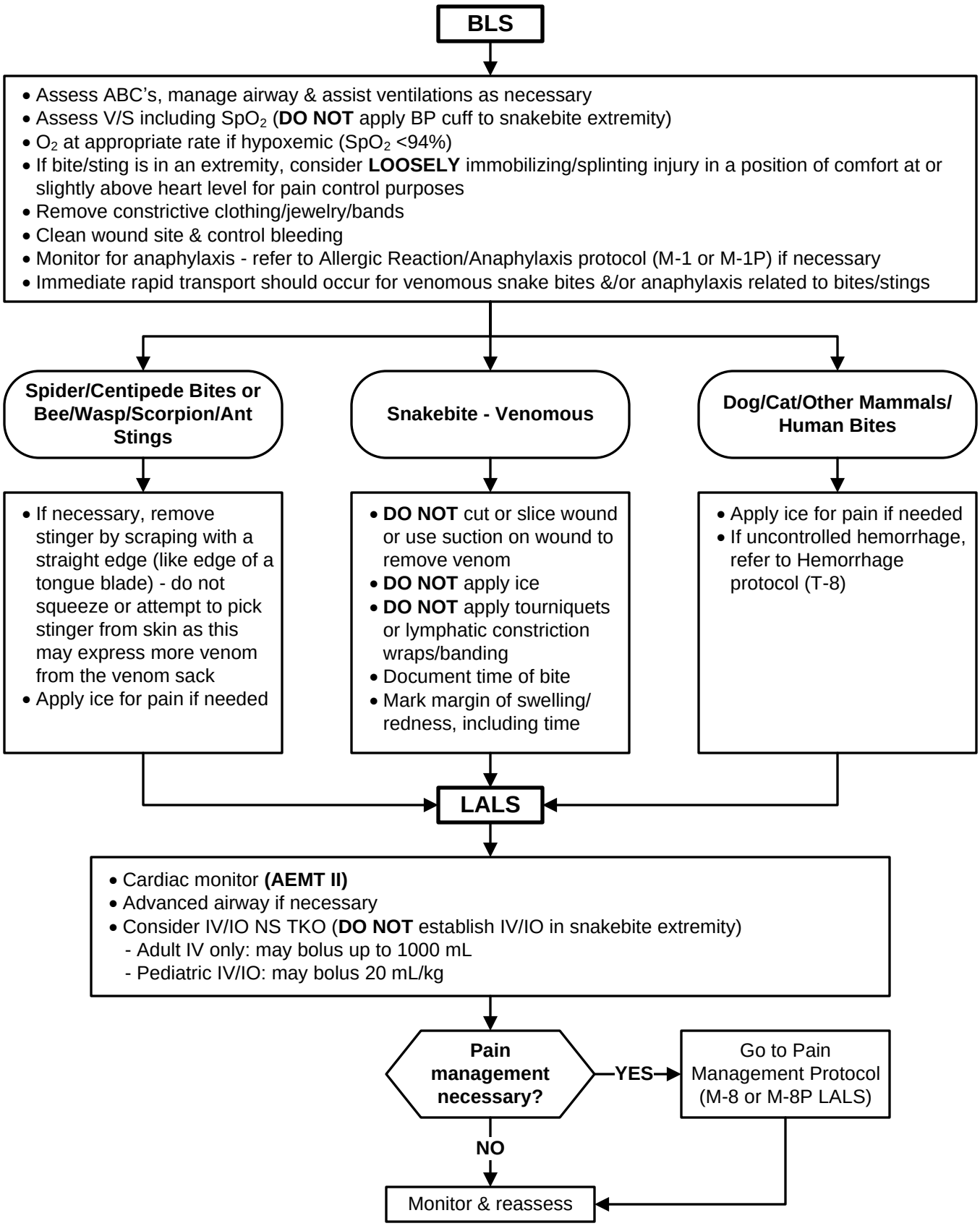
### Snakebite - Venomous

- Bites from pit vipers & others in the crotalinae family are hemotoxic & cytotoxic & may cause pain, localized tissue destruction & edema. Oral paresthesia or metallic taste in the mouth may represent systemic toxicity. Hypotension may be due to fluid loss as a result of edema & usually resolves with antivenom. However, it may be due to the venom itself if no significant edema is noted.
- Bites from coral snakes & others in the elapid family, are neurotoxic and lack the impressive signs of envenomation of pit vipers, but may cause neuromuscular weakness & rapid respiratory depression/failure.
- If a snake bite was from an exotic pet or zoo animal (e.g. coral, cobra, krait, mojave), neurologic &/or respiratory depression may precede local reaction, observe closely for mental status change, respiratory depression, convulsions or paralysis.
- If bite/envenomation is from an exotic species, contact base/modified base hospital early as they may need to consult with poison control for specific antivenom.
- Pre-alert receiving hospital of probable need for antivenom if moderate to severe venomous snake bite is noted.

### Dog/Cat/Other Mammals/Human Bites

- Human bites have higher infection rates than animal bites due to normal mouth bacteria.
- Consider risk for rabies, tetanus & other infections, especially in cat & other carnivore bites.
- Concern must be given for bleeding, infection & wound healing complications in patients with significant health history &/or extremes of age.

**See page 2 for treatment of bites/envenomations**


BLS
• Assess ABC's, manage airway & assist ventilations as necessary
• Assess V/S including $SpO_2$ (**DO NOT** apply BP cuff to snakebite extremity)
• $O_2$ at appropriate rate if hypoxemic ($SpO_2$ <94%)
• If bite/sting is in an extremity, consider **LOOSELY** immobilizing/splinting injury in a position of comfort at or slightly above heart level for pain control purposes
• Remove constrictive clothing/jewelry/bands
• Clean wound site & control bleeding
• Monitor for anaphylaxis - refer to Allergic Reaction/Anaphylaxis protocol (M-1 or M-1P) if necessary
• Immediate rapid transport should occur for venomous snake bites &/or anaphylaxis related to bites/stings
Spider/Centipede Bites or Bee/Wasp/Scorpion/Ant Stings
Snakebite - Venomous
Dog/Cat/Other Mammals/ Human Bites
• If necessary, remove stinger by scraping with a straight edge (like edge of a tongue blade) - do not squeeze or attempt to pick stinger from skin as this may express more venom from the venom sack
• Apply ice for pain if needed
• **DO NOT** cut or slice wound or use suction on wound to remove venom
• **DO NOT** apply ice
• **DO NOT** apply tourniquets or lymphatic constriction wraps/banding
• Document time of bite
• Mark margin of swelling/ redness, including time
• Apply ice for pain if needed
• If uncontrolled hemorrhage, refer to Hemorrhage protocol (T-8)
LALS
• Cardiac monitor **(AEMT II)**
• Advanced airway if necessary
• Consider IV/IO NS TKO (**DO NOT** establish IV/IO in snakebite extremity)
- Adult IV only: may bolus up to 1000 mL
- Pediatric IV/IO: may bolus 20 mL/kg
Pain management necessary?
YES
Go to Pain Management Protocol (M-8 or M-8P LALS)
NO
Monitor & reassess

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-1 (LALS) |
|---|---|
| **General Trauma Management** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- **Limit on scene procedures for pts meeting Field Trauma Triage Criteria to:**
  **- Pt assessment - Airway management - Hemorrhage control - Immobilization/splinting - SMR**
- **Transport pts with known/apparent third trimester pregnancy in left-lateral position.**
- **Notify receiving hospital of a 'Trauma Alert' as soon as possible for pts meeting Field Trauma Triage Criteria.**

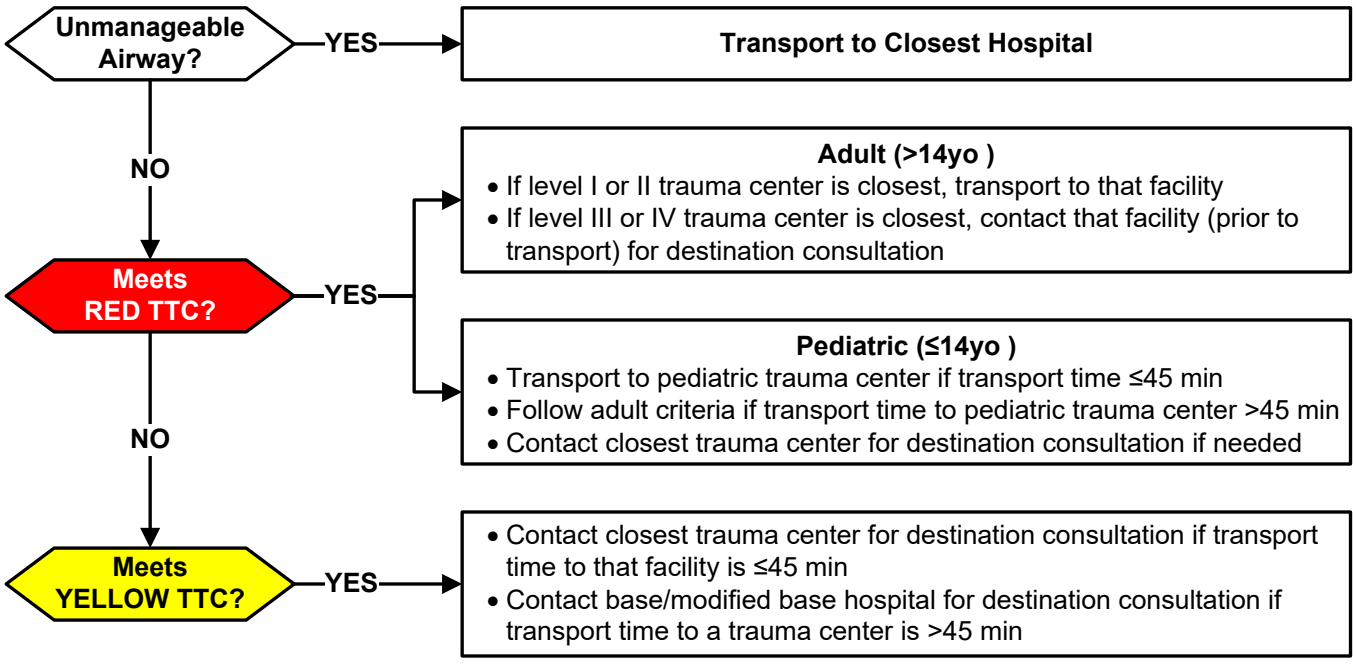
## BLS

- Assess & support ABCs
- Assess V/S, including $SpO_2$
- $O_2$ at appropriate rate if hypoxemic ($SpO_2$ <94%) or short of breath
- Control hemorrhage & immobilize/splint injuries as needed
- Initiate spinal motion restriction (SMR) if indicated (see page 3)
- Maintain body temperature, keep warm

## LALS

- Consider advanced airway if indicated
- Consider $EtCO_2$ monitoring **(AEMT II)** if indicated (see protocol T-3 LALS or T-3P LALS)
- Consider application of a pelvic binder if indicated (see page 2)
- Cardiac monitor **(AEMT II)**
- Establish vascular access if indicated (see page 2)
- Consider pain management if indicated (see protocol M-8 LALS or M-8P LALS)

## Field Trauma Triage Criteria (TTC) Pt Destination (see page 4 for TTC details)



## Vascular Access

**Need or anticipated need for fluid or medication administration?**

NO → Vascular access not indicated

YES ↓

**IV/IO (AEMT IO use authorized for pediatric pts only) – NS or LR**

- Initiate vascular access on all pts meeting Field Trauma Triage Criteria
- Initiate second vascular access on adult pts presenting with hypotension (SBP <90 for pts <65 years of age, or SBP <100 for pts ≥65 years of age), or if thoracic/abdominal pain is present
- Fluid resuscitation guidelines:
  - Adult pts:
    - Administer 500 mL fluid boluses for signs of hypoperfusion/shock
    - Reassess hemodynamic parameters, respiratory status and lung sounds after each fluid bolus
    - Titrate fluid boluses to SBP of ≥90 for pts <65 years of age, or ≥100 for pts ≥65 years of age
  - Pediatric pts:
    - Administer 20 mL/kg fluid boluses for signs of hypoperfusion/shock
    - Reassess hemodynamic parameters, respiratory status and lung sounds after each bolus
    - Titrate fluid boluses to age appropriate SBP (max: 60 mL/kg)

## Commercial Pelvic Binder

**Approved Commercial Pelvic Binders: 1) T-POD Pelvic Stabilization Device, 2) SAM Pelvic Sling 2**

- Utilization of a commercial pelvic binder is optional, and only approved for AEMT/paramedic personnel. ALS/LALS provider agencies must ensure that their personnel are appropriately trained on the application/use of the device, as misplacement of pelvic binders can significantly decrease the ability of the binder to reduce pelvic ring fractures.
- Physical exam findings which may indicate the presence of a pelvic ring fracture include, but are not limited to:
  - Crepitus when applying compression to the iliac crests
  - Perineal or genital swelling
  - Testicular/groin pain
  - Blood at the urethral meatus
  - Rectal, vaginal or perineal lacerations/bleeding
- When stabilizing a suspected pelvic ring fracture, care must be taken not to over-reduce the fracture. Over-reduction can be assessed by examining the position of the legs, greater trochanters and knees with the pt supine. The goal is to achieve normal anatomic position of the pelvis, so the lower legs should be symmetrical after stabilization.
- When clinically indicated and logistically feasible, the pelvic binder should be placed prior to extrication/movement.
- Pelvic binders should be placed directly to skin. Once applied, pelvic binders should not be removed.
- If possible, avoid log-rolling pts with a suspected pelvic fracture.

**Mechanism of injury suggestive of a pelvic fracture?**

NO → Pelvic binder not indicated

YES ↓

**Does pt present with one or more of the following?**

- Physical exam findings suggestive of a pelvic fracture
- Hemodynamic instability: HR >100 & SBP <90 (or SBP <100 in pts ≥65 years of age)
- GCS ≤13

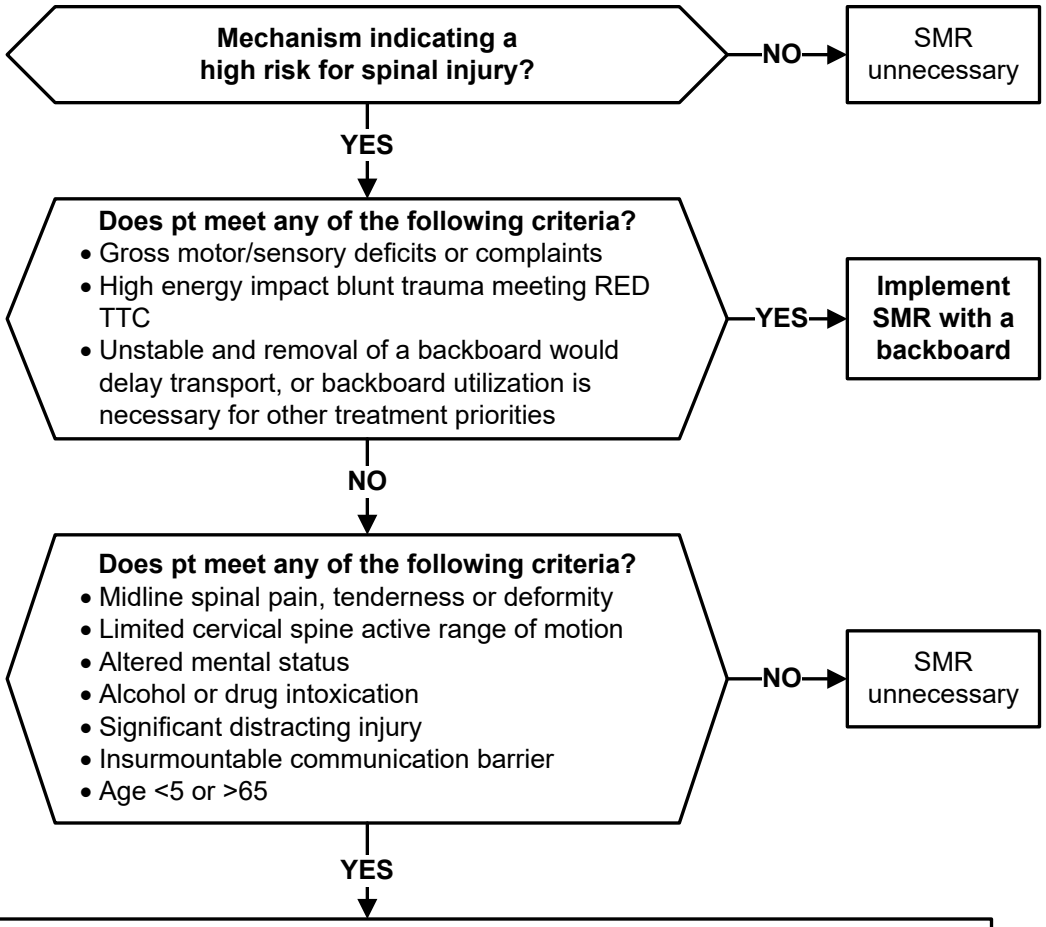
NO → Pelvic binder not indicated

YES ↓

Apply pelvic binder according to manufacturer instructions

## Spinal Motion Restriction (SMR)

- A backboard shall not be utilized for pts with penetrating trauma to the head, neck or torso without evidence of spinal injury
- Helmet removal guidelines:
  - For pts who meet criteria for SMR with a backboard, football helmets should only be removed if they prevent adequate SMR or under the following circumstances:
    - If the helmet and chin strap fail to hold the head securely or prevent adequate airway control.
    - If the facemask cannot be removed.
  - Football helmets should be carefully removed to allow for appropriate SMR of pts who do not meet criteria for backboard utilization.
  - All other types of helmets (bicycle, motorcycle, etc.) should be carefully removed to allow for appropriate SMR.




**Implement SMR without a backboard as follows:**

- Apply a cervical collar
- Allow ambulatory pts to sit on the stretcher and then lie flat (no 'standing take-down")
- If necessary, move pt from the position found to the ambulance stretcher utilizing a device such as a KED, scoop stretcher, backboard, or if necessary, by having the pt stand and pivot to the stretcher – do not permit the pt to struggle to their feet from a seated or supine position
- Once on the ambulance stretcher, remove any hard backboard device & instruct the pt to lie still
- The head of the stretcher may be elevated 20-30$^0$ in a position of comfort
- Secure cross stretcher straps and over-the-shoulder belts firmly
- Pts with nausea &/or vomiting may by placed in the lateral recumbent position, maintaining the head in a neutral position using manual stabilization, padding, pillows, &/or the pt's arm

# Field Trauma Triage Criteria (TTC)

| RED TTC (High Risk for Serious Injury) | |
|---|---|
| **Injury Patterns** | **Mental Status/Vital Signs** |
| • Penetrating injuries to head, neck, torso, &/or proximal extremities<br>• Skull deformity, suspected skull fracture<br>• Suspected spinal injury with new motor/sensory loss<br>• Chest wall instability, deformity, or suspected flail chest<br>• Suspected pelvic fracture<br>• Suspected fracture of two or more proximal long bones in a pt of any age, or one or more proximal long bone fracture in a pt ≤14 or ≥65 years of age<br>• Suspected open proximal long bone fracture<br>• Crushed, degloved, mangled, or pulseless extremity<br>• Amputation proximal to wrist or ankle<br>• Continued, uncontrolled bleeding despite EMS hemorrhage control measures | **MENTAL STATUS**<br>• **<65 years of age:**<br>○ GCS ≤13<br>• **≥65 years of age:**<br>○ GCS <15 (or decreased from baseline) with evidence/suspicion of a head strike<br>**RESPIRATORY STATUS**<br>• **All pt ages:**<br>○ RR <10 or >29 breaths/min<br>○ Resp. distress or need for resp. support<br>○ Room-air $SpO_2$ <90%<br>**CIRCULATORY STATUS**<br>**0-9 years of age:**<br>• SBP <70mm Hg + (2 x age years)<br>**10-64 years of age:**<br>• SBP <90 mmHg **OR** HR>SBP<br>**≥65 years of age:**<br>• SBP <100 mmHG **OR** HR>SBP |

| YELLOW TTC (Moderate Risk for Serious Injury) | |
|---|---|
| **Mechanism of Injury** | **EMS Judgement** |
| • High-Risk Auto Crash<br>○ Partial or complete ejection<br>○ Significant intrusion (including roof)<br>- >12 inches occupant site; or<br>- >18 inches any site; or<br>- Need for extrication for entrapped pt<br>○ Death in passenger compartment<br>○ Child (0-9 years of age) unrestrained or in unsecured child safety seat<br>○ Vehicle telemetry data consistent with severe injury<br>• Rider separated from transport vehicle with significant impact (motorcycle, ATV, horse, etc.)<br>• Pedestrian/bicycle rider thrown, run over, or with significant impact<br>• Fall from height >10 feet (all ages) | EMS personnel should consider the following risk factors, and contact the closest trauma center or base/modified base hospital for destination consultation (see page 1), if transport to a trauma center is believed to be in the pt's best interest:<br>• Low-level falls in young children (≤5 years of age) or older adults (≥65 years of age) with significant head impact<br>• Anticoagulant use<br>• Suspicion of child abuse<br>• Special, high-resource healthcare needs<br>• Pregnancy >20 weeks<br>• Burns in conjunction with trauma |

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-3 (LALS) |
|---|---|
| **Suspected Moderate/Severe Traumatic Brain Injury (TBI)** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

**Prehospital Identification of Moderate/Severe TBI**

- Any pt with a mechanism of injury consistent with a potential for a brain injury, and one or more of the following:
  - <65 years of age with a GCS ≤13, or ≥65years of age with a GCS <15 (or decrease from baseline)
  - Post-traumatic seizures
  - Multi-system trauma requiring advanced airway placement

**For any patient with a suspected moderate/severe TBI, avoid/treat the three TBI "H-Bombs":**
1) **H**yperventilation, 2) **H**ypoxia, 3) **H**ypotension

**BLS**

- Assess V/S, including continuous $SpO_2$ monitoring and pupil exam: Reassess V/S every 3-5 min if possible
- High-flow $O_2$ (regardless of $SpO_2$ reading)
- If continued hypoxia ($SpO_2$ <94%) or inadequate ventilatory effort, proceed through the following in a stepwise manner:
  - Reposition airway
  - Initiate positive pressure ventilation with appropriate airway adjunct if necessary (use of a pressure-controlled BVM &/or ventilation rate timer is recommended if available)
- Avoid hyperventilation (ventilate at a rate of 10 breaths/min)
- Maintain normothermia
- Consider the concurrent need for appropriate immobilization/spinal motion restriction

**LALS**

- Continuous cardiac & $EtCO_2$ monitoring **(AEMT II)**
- IV/IO NS TKO: For SBP <110 bolus 1000 mL N/S, then titrate additional fluids to maintain SBP ≥110
- Check blood glucose

**Blood glucose ≤60 mg/dl?**

**YES** →

**Dextrose 50%**
- 25 gm (50 mL) IV

**OR**

**Glucagon**
- 1 mg (1 unit) IM

**NO**

**For persistent hypoxia &/or inadequate ventilatory effort:**
- Supraglottic airway
- Target EtCO2: 35-39 mmHg **(AEMT II)**

- Transport to appropriate destination & notify receiving facility of a "Trauma Alert" as soon as possible (if applicable)
- Monitor & reassess

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-4 (LALS) |
|---|---|
| **Hemorrhage** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

**Approved Commercial Tourniquet Devices:**

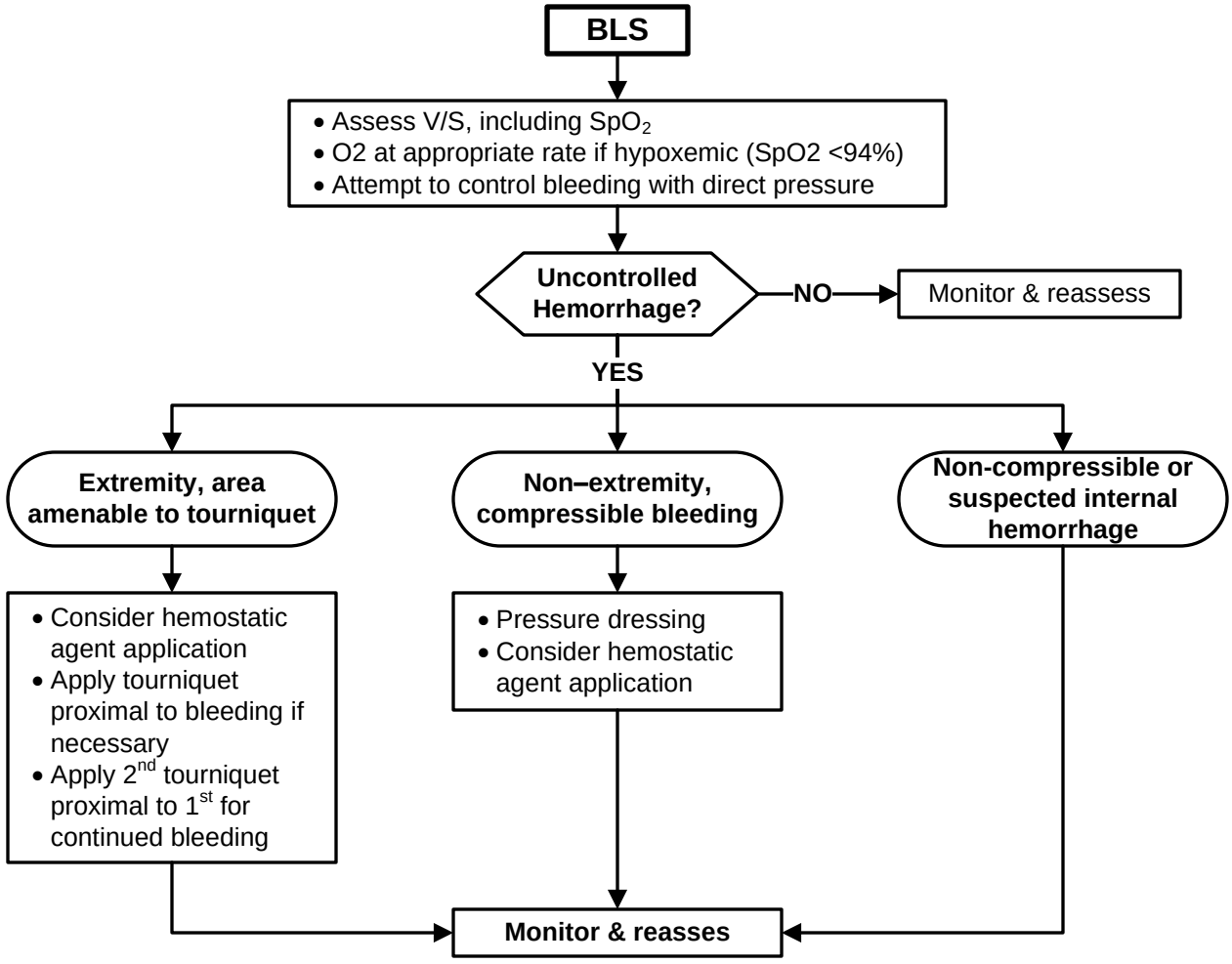
- Combat Application Tourniquet
- Emergency and Military Tourniquet
- Mechanical Advantage Tourniquet
- SAM XT Extremity Tourniquet
- Special Ops. Tactical Tourniquet
- RECON Medical Tourniquet

**Tourniquet Utilization Notes:**

- Tourniquets applied by lay rescuers or other responders shall be evaluated for appropriateness and may be adjusted or removed if necessary – improvised tourniquets should be removed by prehospital personnel.
- If application is indicated and appropriate, a commercial tourniquet should not be loosened or removed by prehospital personnel unless time to definitive care will be greatly delayed (>2 hrs).

**Approved Hemostatic Agents:**

- QuikClot EMS 4x4 & Combat Gauze
- HemCon ChitoGauze XR PRO
- HemCon ChitoGauze XR2 PRO
- HemCon ChitoGauze OTC
- HemCon Bandage PRO
- HemCon OneStop Bandage



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-5 (LALS) |
|---|---|
| **Burns** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

**Information Needed**

- Type/source of burn: chemical, electrical, thermal, steam
- Complicating factors: concomitant trauma, exposure in enclosed space, total time of exposure, drug or alcohol use, smoke or toxic fumes, delayed resuscitation, compartment syndrome of extremities, chest, or abdomen.

**Objective Findings**

- Evidence of inhalation injury or toxic exposure (i.e., carbonaceous sputum, hoarseness/stridor, or singed nasal hairs).
- Extent of burn: full or partial thickness and body surface area (BSA) affected.
- Entrance or exit wounds for electrical or lightning strike or trauma from an explosion, electrical shock or fall.

**Transport Notes**

- All pts suffering from an electrical burn shall be transported for evaluation.
- Contact the closest base/modified base hospital for destination consultation on pts with any of the following:
  - Full thickness ($3^o$) burns of the hands, feet, face, perineum, or >2% of any BSA
  - Partial thickness ($2^o$) burns >9% of BSA
  - Significant electrical or chemical burns

**BLS**

- $O_2$ at appropriate rate, consider BVM early for altered LOC or respiratory distress
- Assess V/S, including $SpO_2$
- Remove wet dressings and cover with dry, clean dressings

**LALS**

- Cardiac monitor **(AEMT II)**
- Consider $EtCO_2$ monitoring/trending **(AEMT II)**
- Consider early advanced airway if evidence of inhalation injury or compromised respiratory effort
  - ⓘ The likelihood of airway compromise is increased in burn pts receiving IV/IO fluid administration
  - ⓘ Airway compromise/occlusion is likely for pts with burns >25-30% BSA, regardless of location of burns

**IV/IO (AEMT IO use authorized for pediatric pts only) – NS/LR TKO (in non-burned extremity)**

- For $2^o$ & $3^o$ burns >9% BSA, facial burns, or if IV/IO pain management is necessary
- Administer 1000 mL fluid bolus for adult pts or 20 mL/kg fluid bolus for pediatric pts with $2^o$ or $3^o$ burns >9% BSA or signs of hypovolemia (note increased airway compromise warning above & closely monitor)

**Albuterol (if wheezes are present)**

- 5 mg in 6 mL NS via HHN, mask or BVM

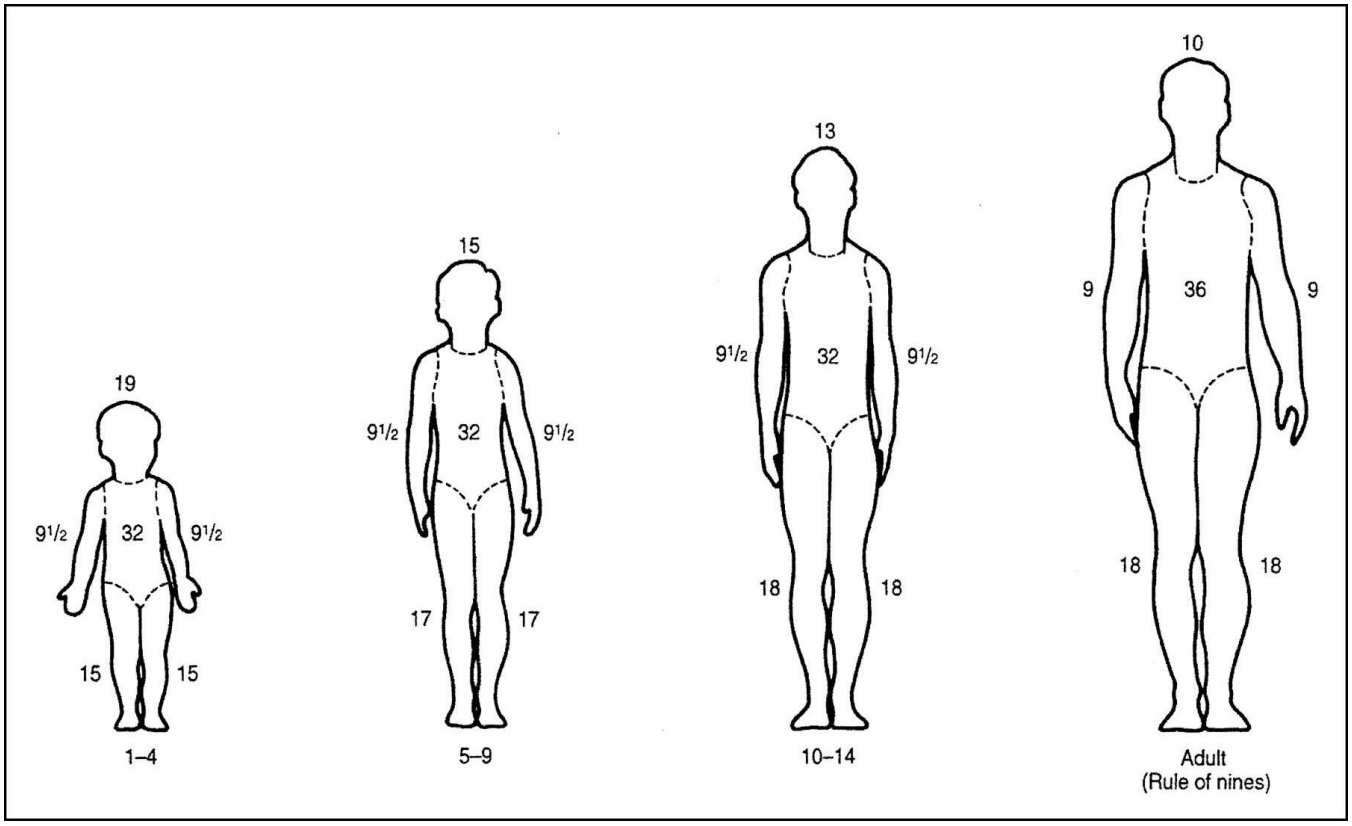
**Does pt meet trauma triage criteria?**

YES → Destination Per General Trauma Mgmt. Protocol (T-1 LALS)

**Pain management necessary?**

YES → Go to Pain Mgmt. Protocol (M-8/M-8P LALS)

## Burn Chart


19
9½
32
9½
15
15
1–4
15
9½
32
9½
17
17
5–9
13
9½
32
9½
18
18
10–14
10
9
36
9
18
18
Adult
(Rule of nines)

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-6 (LALS) |
|---|---|
| **Traumatic Pulseless Arrest** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

- Assess etiology – if there is suspicion that a medical event caused the traumatic arrest, treat per the applicable Non-Traumatic Pulseless Arrest Protocol (C-1 or C-1P).
- Epinephrine is likely not beneficial and may be harmful in traumatic pulseless arrest.
- Utilize mechanical chest compression devices in accordance with manufacturer indications/contraindications. If a mechanical chest compression device is used, transport shall not be significantly delayed for application of the device.
- Biphasic manual defibrillation detail **(AEMT II)**: follow manufacturer's recommendations, if unknown, start at 200 J (subsequent doses should be equivalent or higher).
- CPR need not be initiated, and may be discontinued, for patients who meet S-SV EMS Obvious Death or Probable Death Criteria (Refer to Policy 820).

## BLS

- High-Quality CPR (with BVM &100% $O_2$) – apply AED as soon as possible
- Deliver ⚡⚡ **AED SHOCK** ⚡⚡, if indicated by AED, & immediately resume high-quality CPR
- Hemorrhage control as appropriate
- Consider Spinal Motion Restriction (SMR) with a backboard for the following:
  - CPR
  - Blunt mechanism indicating a high risk for spinal injury

## LALS

- Initiate rapid transport – LALS treatment/monitoring should be performed during transport
- Cardiac monitor **(AEMT II)**
- Continue CPR followed by ⚡⚡ **DEFIBRILLATION** ⚡⚡ every 2 mins for continued/relapsed shockable rhythm (VF/VT)
- IV/IO (IO authorized for pediatric pts only) NS:
  - **Adult pts:** Administer 1 L fluid bolus
  - **Pediatric pts:** Administer 20 mL/kg fluid bolus

**Return of Spontaneous Circulation (ROSC)**

- Manage airway as needed, optimize ventilation & oxygenation
  - $O_2$ at appropriate rate to maintain $SpO_2$ ≥94% (do not hyperventilate)
- Assess V/S, including $SpO_2$ – reassess V/S every 3-5 mins if possible
- Continuous $ETCO_2$ monitoring **(AEMT II)** – goal 35-45 mmHg
- Titrate fluid boluses:
  - **Adult pts:** Titrate to SBP of ≥90 for pts <65 years of age, or ≥100 for pts ≥65 years of age
  - **Pediatric pts:** Titrate to age appropriate SBP (max: 60 mL/kg)
- Monitor for reoccurrence of pulseless arrest

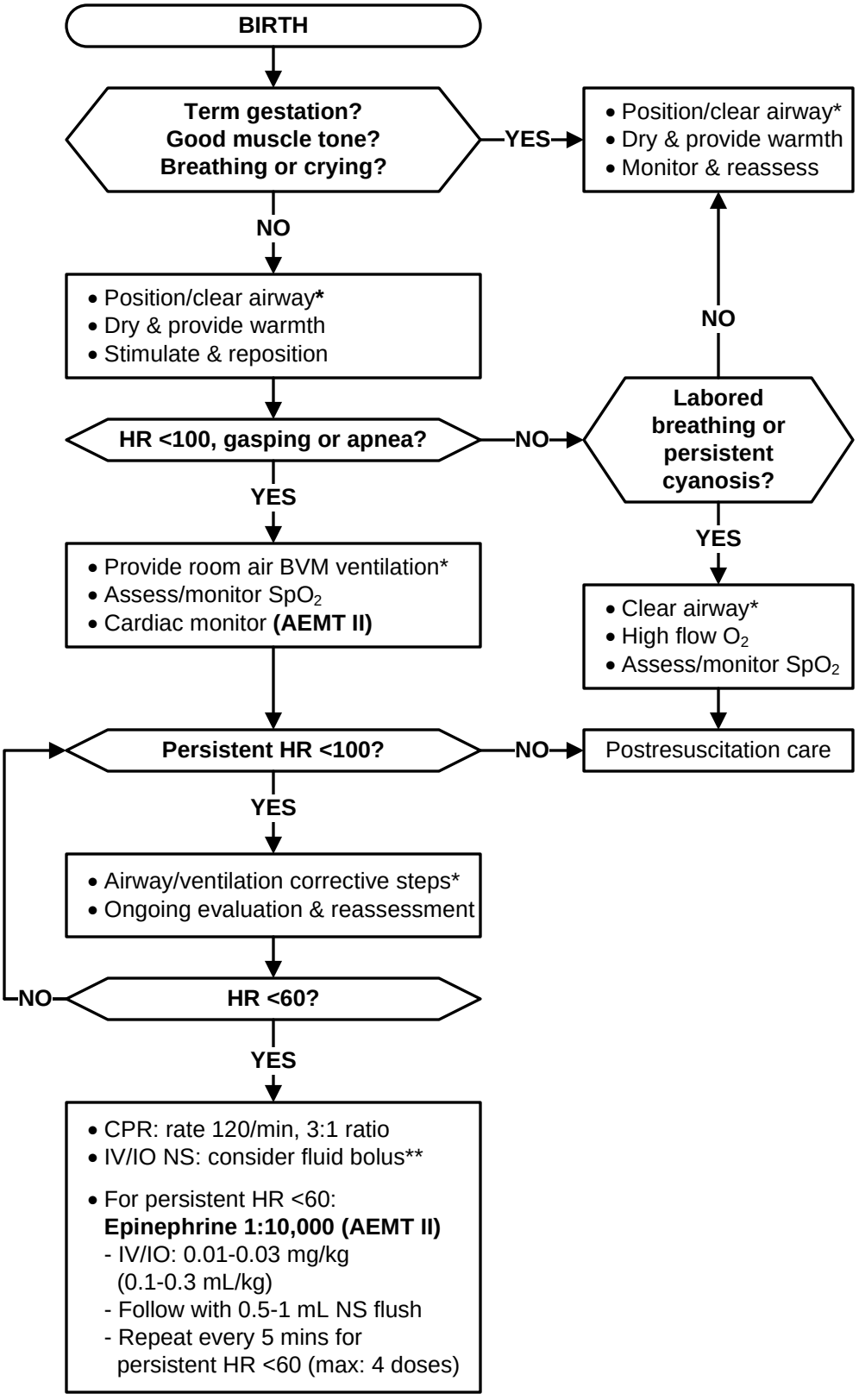
| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-1N (LALS) |
|---|---|
| **Neonatal Resuscitation** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

***Airway/Ventilation**

- Position in a "sniffing" position to open the airway & clear secretions with a bulb syringe if necessary.
- If no improvement, & chest is not moving with BVM ventilation, the trachea may be obstructed by thick secretions/meconium. Use a bulb syringe, or suction catheter if necessary, to clear the nose, mouth & oropharynx.
- Convert from room air to high flow $O_2$ for persistent bradycardia &/or cyanosis.
- If HR persistently <60, consider hypovolemia &/or pneumothorax.
- Target $SpO_2$ after birth:
  - 1 min: 60% - 65%
  - 2 min: 65% - 70%
  - 3 min: 70% - 75%
  - 4 min: 75% - 80%
  - 5 min: 80% - 85%
  - 10 min: 85% - 95%

****Fluid Bolus**

- Contact the base/ modified base hospital for specific fluid bolus volume direction.



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-1P (LALS) |
|---|---|
| **Pediatric Pulseless Arrest** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 01/2027 |

## INFANT CPR

- Perform chest compressions with minimal interruptions (≤10 secs)
  - 1 rescuer: 2 finger compressions
  - 2 rescuer: 2 thumbs with hands encircling chest
- Rate: 100-120/min
- Depth: 1/3 diameter of the chest (approx. 1 ½")
- Compression/ventilation ratio:
  - 1 rescuer: 30:2
  - 2 rescuer: 15:2
- Perform CPR during AED/defibrillator charging & resume CPR immediately after shock

## CHILD CPR

- Perform chest compressions with minimal interruptions (≤10 secs)
  - 1 or 2 hand compressions
- Rate: 100-120/min
- Depth: 1/3 diameter of the chest (approx. 2")
- Compression/ventilation ratio:
  - 1 rescuer: 30:2
  - 2 rescuer: 15:2
- Perform CPR during AED/defibrillator charging & resume CPR immediately after shock

## DEFIBRILLATION & OVERALL MANAGEMENT

- Analyze rhythm & check pulse after every 2 min CPR cycle
- AED detail:
  - Use child pads, if available, for infants & children <8 years old
  - If child pads not available, use adult pads, make sure pads do not touch each other or overlap
  - Adult pads deliver a higher shock dose, but a higher shock dose is preferred to no shock
- Manual defibrillation detail **(AEMT II)**:
  - Initial dose: 2 J/kg, subsequent doses: 4 J/kg
- Movement of pt may interrupt CPR or prevent adequate depth and rate of compressions
- Consider resuscitation on scene up to 20 mins

## ADVANCED AIRWAY MANAGEMENT

- Consider/establish advanced airway (LALS only) at appropriate time during resuscitation
- Do not interrupt chest compressions to establish an advanced airway
- Waveform capnography shall be used on all pts with an advanced airway in place
  - An abrupt increase in $PETCO_2$ is indicative of ROSC
  - Persistently low $PETCO_2$ levels (<10 mmHG) suggest ROSC is unlikely

## TREAT REVERSIBLE CAUSES

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen Ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis, pulmonary
- **T**hrombosis, cardiac
- **T**oxins

ⓘ Refer to Hypothermia & Avalanche/Snow Immersion Suffocation Resuscitation Protocol (E-2) or Traumatic Pulseless Arrest Protocol (T-6) as appropriate

ⓘ Contact the base/modified base hospital for consultation & orders as appropriate

ⓘ Consider early transport of pts who have reversible causes that cannot be adequately treated in the prehospital setting

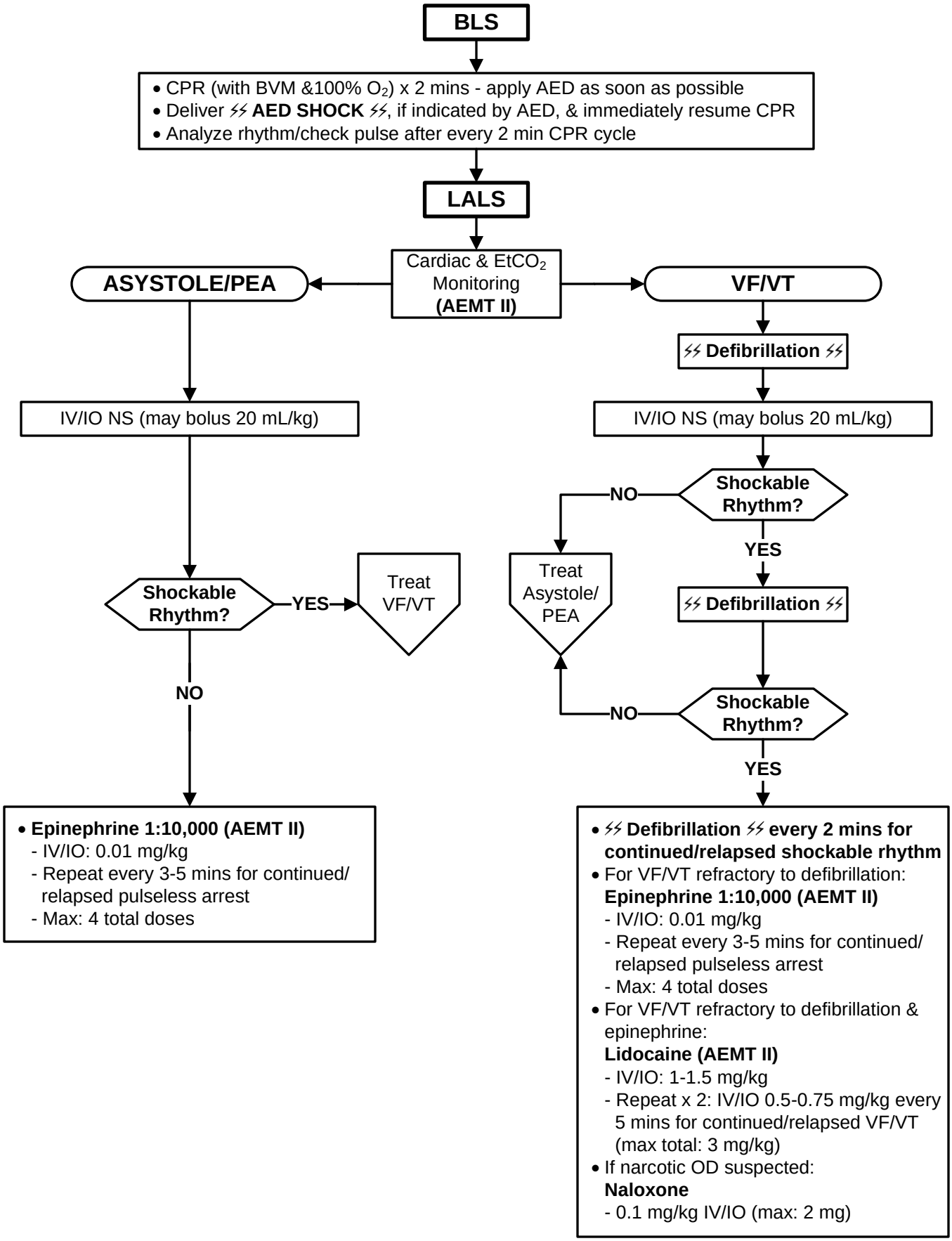
## TERMINATION OF RESUSCITATION

**<u>Base/Modified Base Hospital Physician Order Only</u>**

- If non-shockable rhythm persists, despite appropriate, aggressive ALS interventions for 30 mins (or if $EtCO_2$ is <10 mm Hg after 20 mins in a pt with an advanced airway), consider discontinuation of CPR

**SEE PAGE 2 FOR TREATMENT ALGORITHM**

# Pediatric Pulseless Arrest



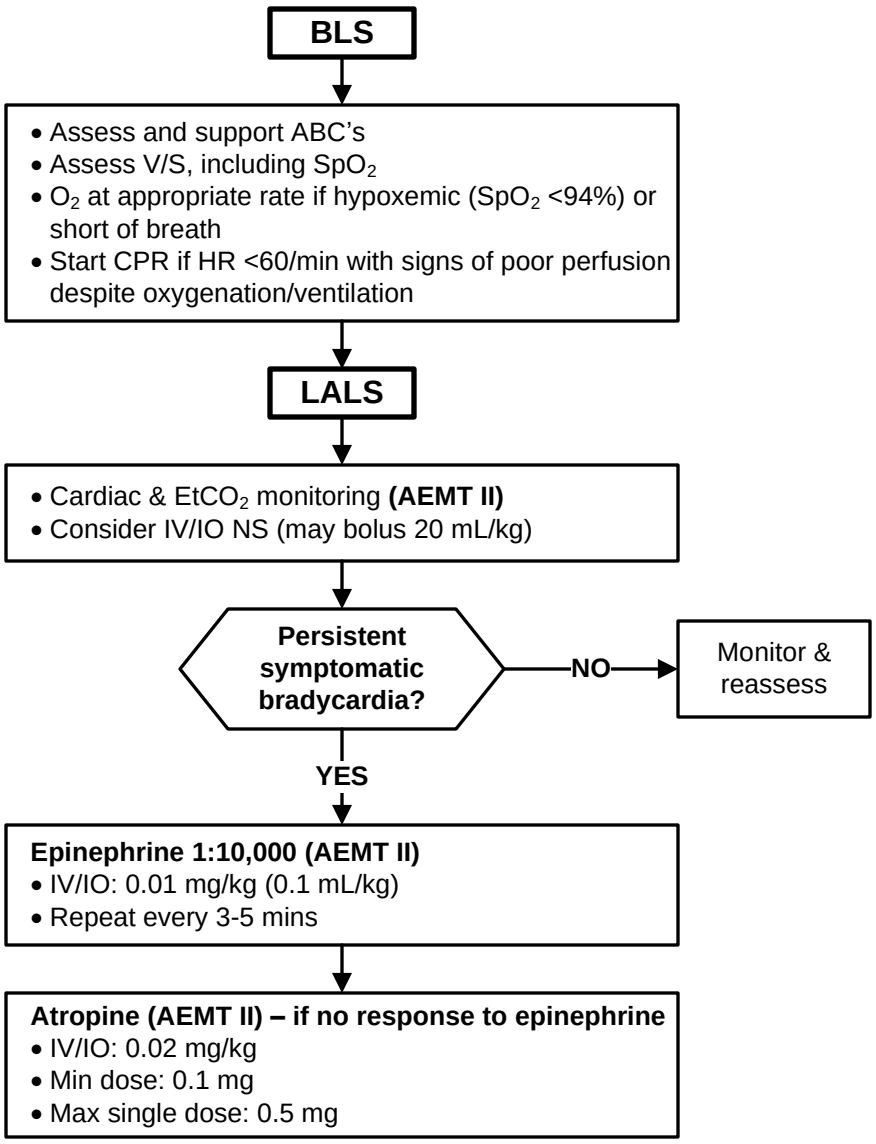
| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-3P (LALS) |
|---|---|
| **Pediatric Bradycardia With Pulses** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

**Search For Possible Contributing Factors**

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen Ion (Acidosis)
- **H**ypo-/hyperkalemia
- **H**ypothermia
- **T**amponade, cardiac
- **T**ension pneumo
- **T**hrombosis, pulmonary
- **T**hrombosis, cardiac
- **T**oxins

**Signs of Cardiopulmonary Compromise**

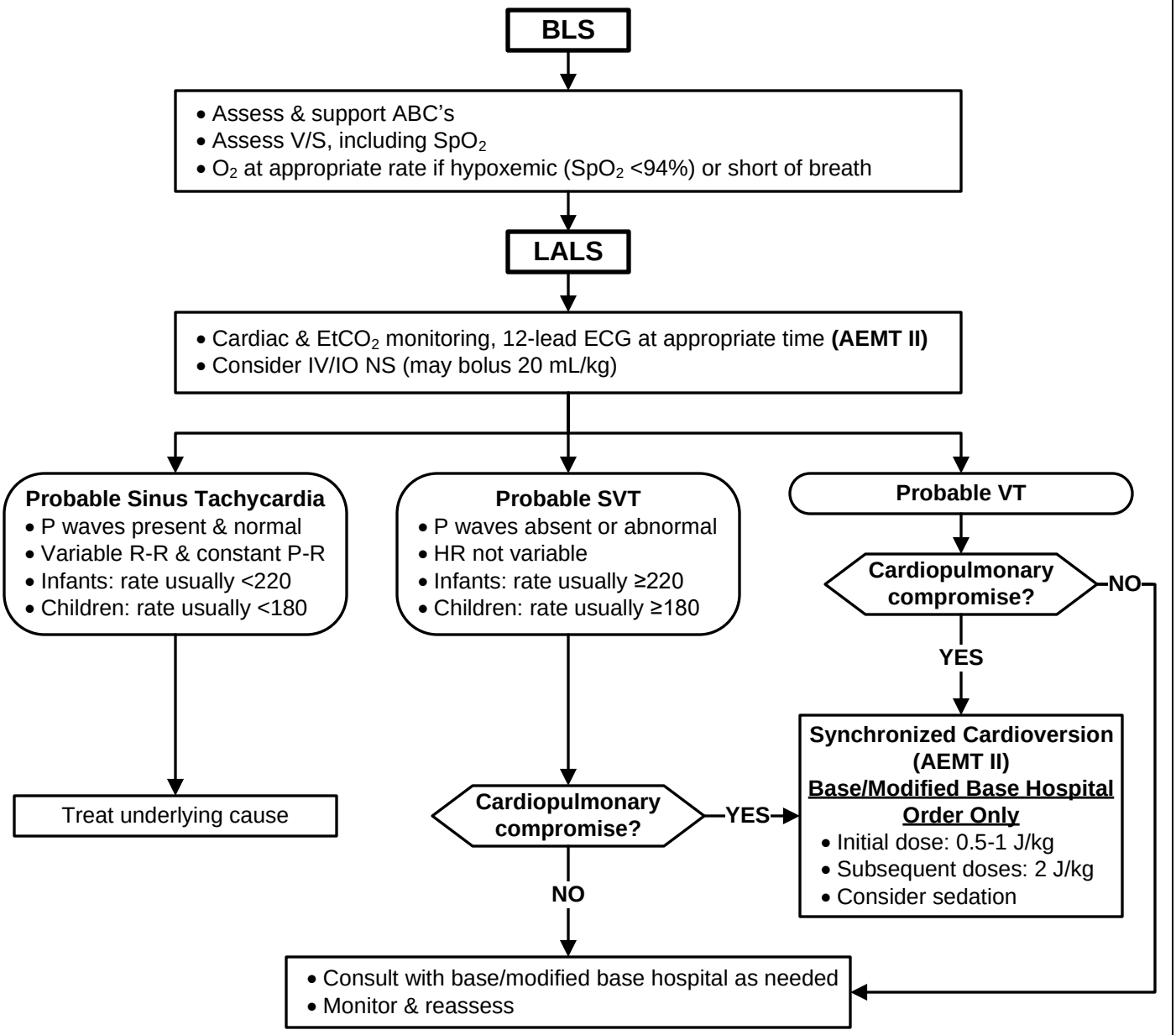
- Acutely altered mental status
- Hypotension
- Signs of shock



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | C-4P (LALS) |
|---|---|
| **Pediatric Tachycardia With Pulses** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

**Signs of Cardiopulmonary Compromise**

- Acutely altered mental status
- Hypotension
- Signs of shock

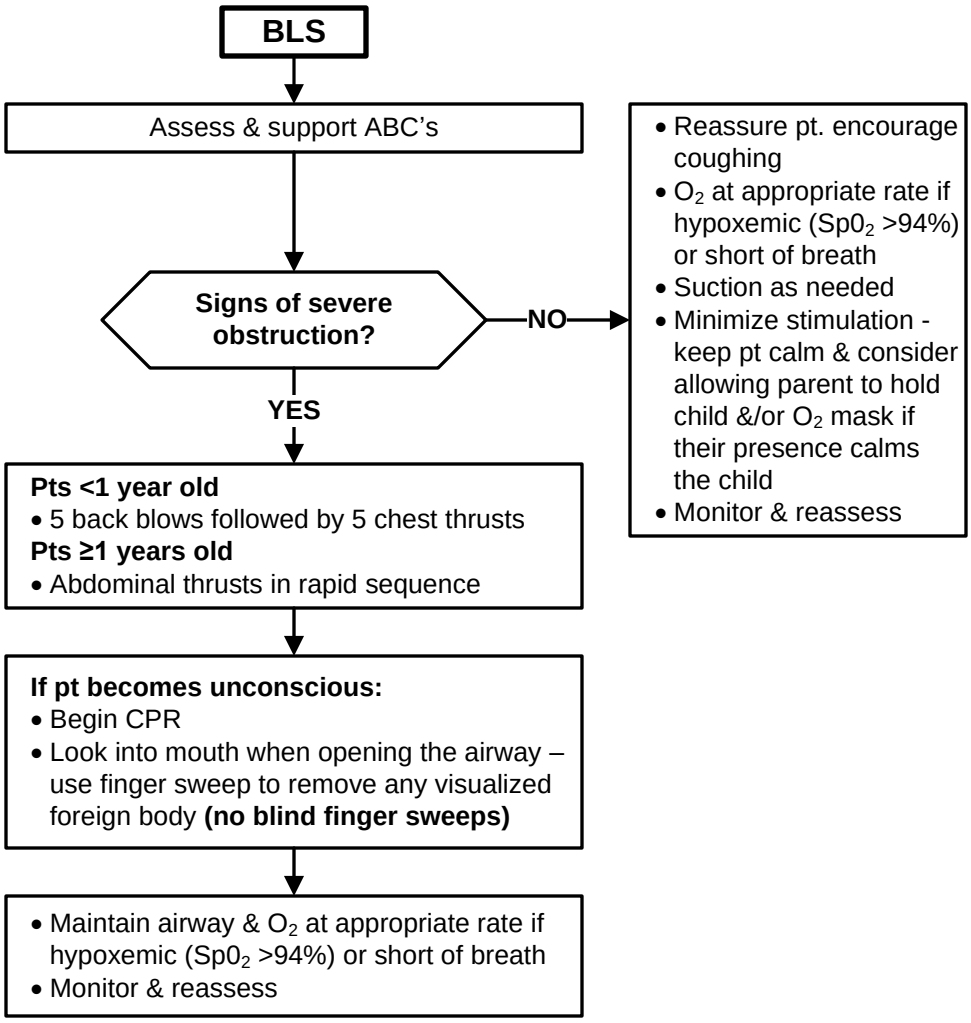


| Sierra – Sacramento Valley EMS Agency Treatment Protocol | R-1P (LALS) |
|---|---|
| **Pediatric Foreign Body Airway Obstruction (FBAO)** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

- Signs/symptoms of FBAO: sudden onset of respiratory distress with coughing, gagging, stridor, or wheezing.
- Do not use tongue/jaw lift or perform blind finger sweep.
- Do not perform deep suctioning. Oropharyngeal suctioning should be performed while visualizing the FBAO.

**Signs of severe obstruction:**

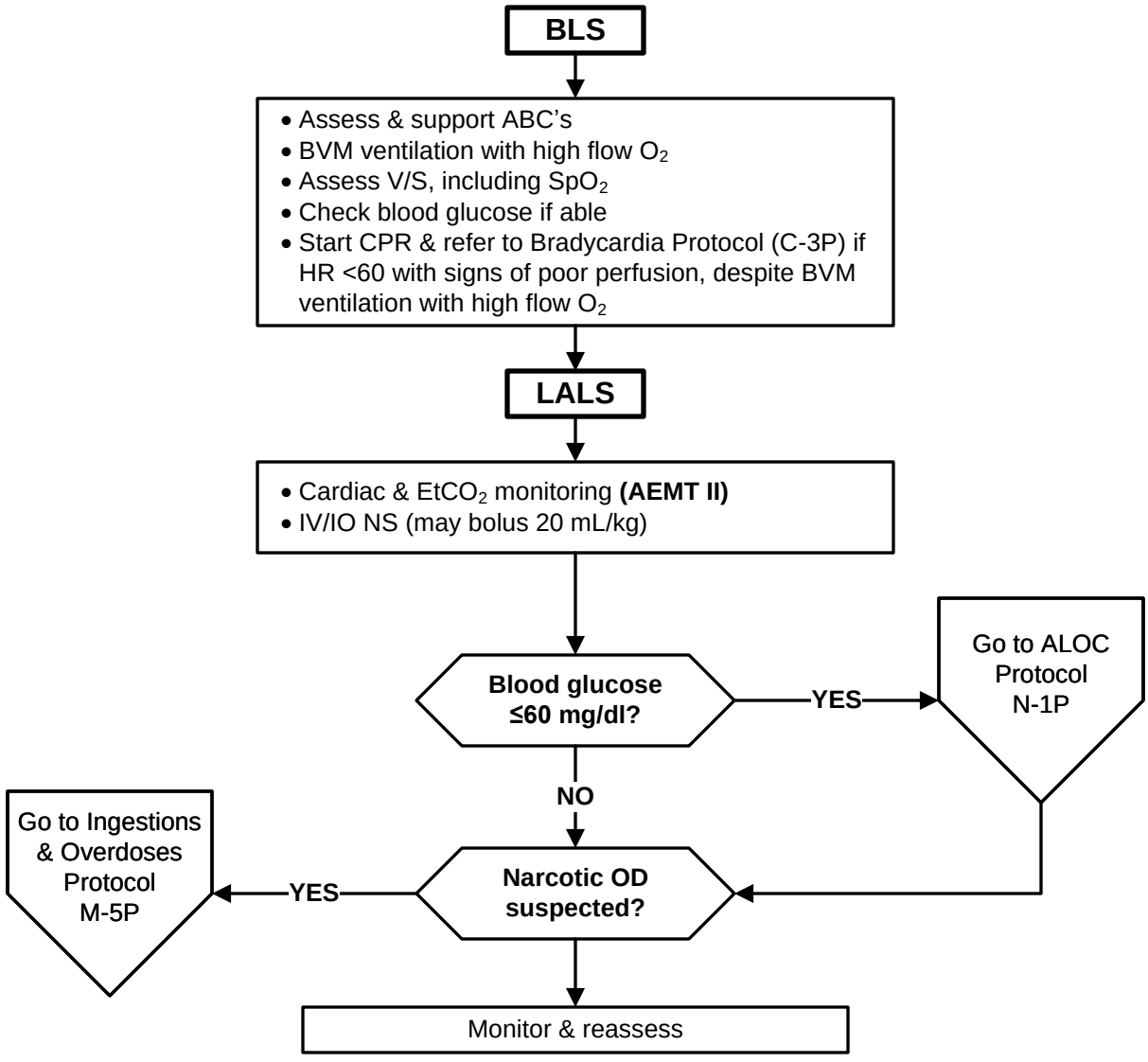
- Poor air exchange - Silent cough - Increased breathing difficulty - Inability to speak or breathe - Cyanosis



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | R-2P (LALS) |
|---|---|
| **Pediatric Respiratory Arrest** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

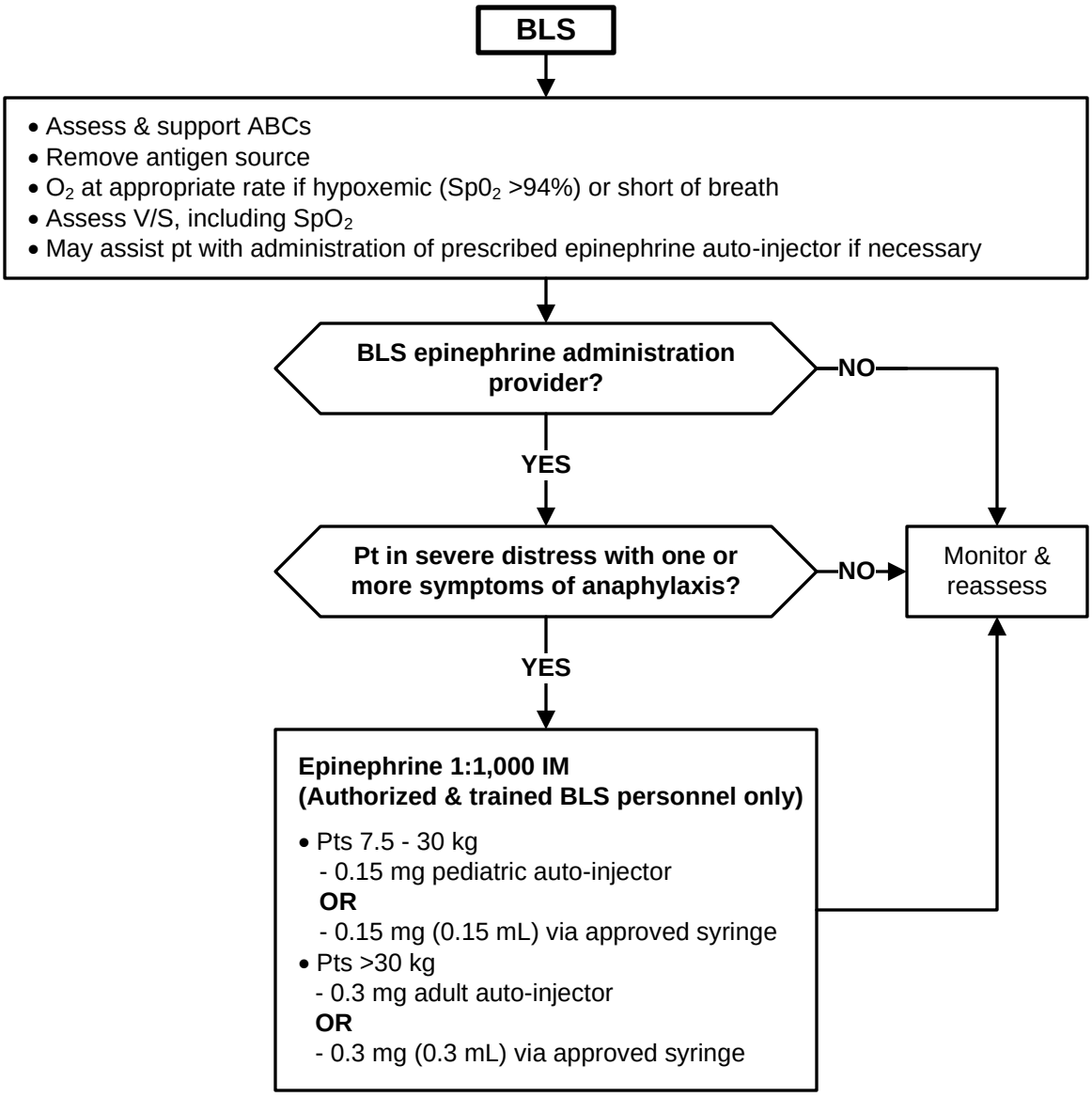
**Anticipate respiratory failure & possible respiratory arrest if any of the following are present:**

- Increased respiratory rate, with signs of distress (e.g. increased effort, nasal flaring, retractions, or grunting).
- Inadequate respiratory rate, effort, or chest excursion (e.g. diminished breath sounds, gasping, and cyanosis), especially if mental status is depressed.

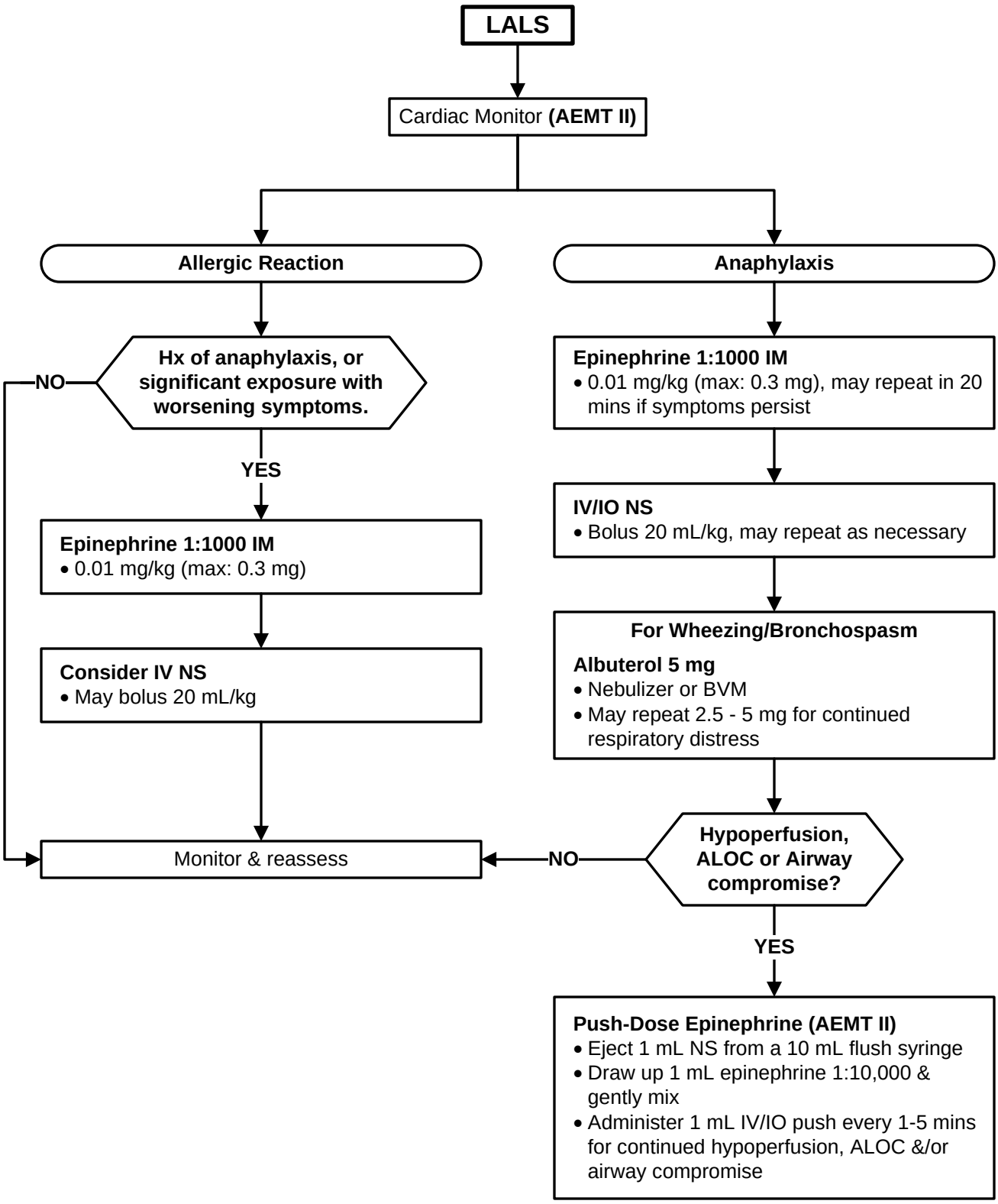


| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-1P (LALS) |
|---|---|
| **Pediatric Allergic Reaction/Anaphylaxis** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

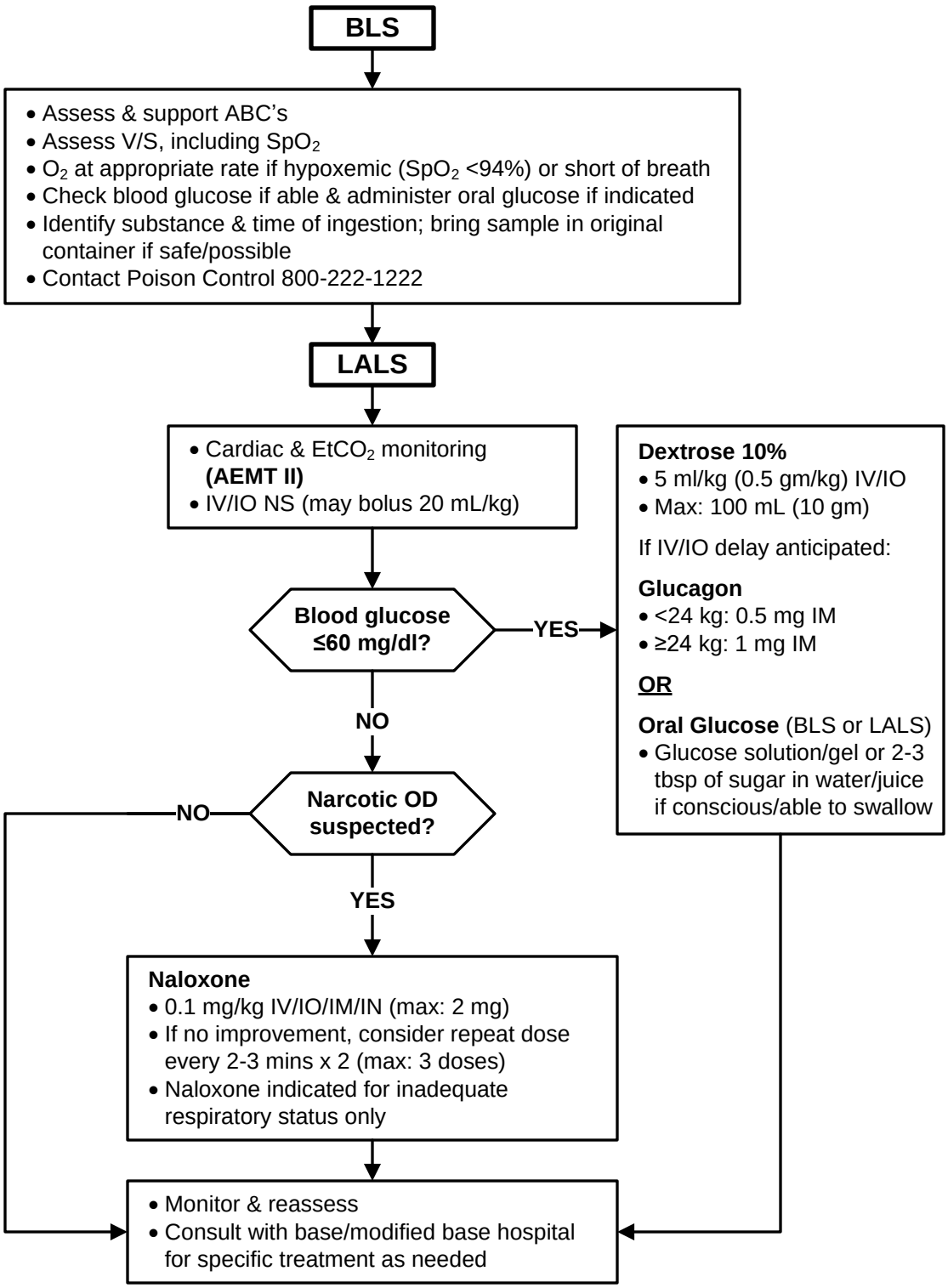
- **Allergic reaction:** Sensitivity to an allergen causing hives, pruritus, flushing, rash, nasal congestion, watery eyes, and/or angioedema not involving the airway, and/or vomiting, diarrhea.
- **Anaphylaxis:** Severe allergic reaction with one or more of the following symptoms: abnormal appearance (agitation, restlessness, somnolence), respiratory distress, bronchospasm/wheezes/diminished breath sounds, hoarseness, stridor, edema involving the airway, diminished perfusion, loss of consciousness.
- Administer Auto-Injector/IM epinephrine into the lateral thigh, midway between waist & knee.




**SEE PAGE 2 FOR LALS TREATMENT**


LALS
Cardiac Monitor (AEMT II)
Allergic Reaction
Anaphylaxis
Hx of anaphylaxis, or significant exposure with worsening symptoms.
NO
YES
Epinephrine 1:1000 IM
• 0.01 mg/kg (max: 0.3 mg)
Consider IV NS
• May bolus 20 mL/kg
Monitor & reassess
Epinephrine 1:1000 IM
• 0.01 mg/kg (max: 0.3 mg), may repeat in 20 mins if symptoms persist
IV/IO NS
• Bolus 20 mL/kg, may repeat as necessary
For Wheezing/Bronchospasm
Albuterol 5 mg
• Nebulizer or BVM
• May repeat 2.5 - 5 mg for continued respiratory distress
Hypoperfusion, ALOC or Airway compromise?
NO
YES
Push-Dose Epinephrine (AEMT II)
• Eject 1 mL NS from a 10 mL flush syringe
• Draw up 1 mL epinephrine 1:10,000 & gently mix
• Administer 1 mL IV/IO push every 1-5 mins for continued hypoperfusion, ALOC &/or airway compromise

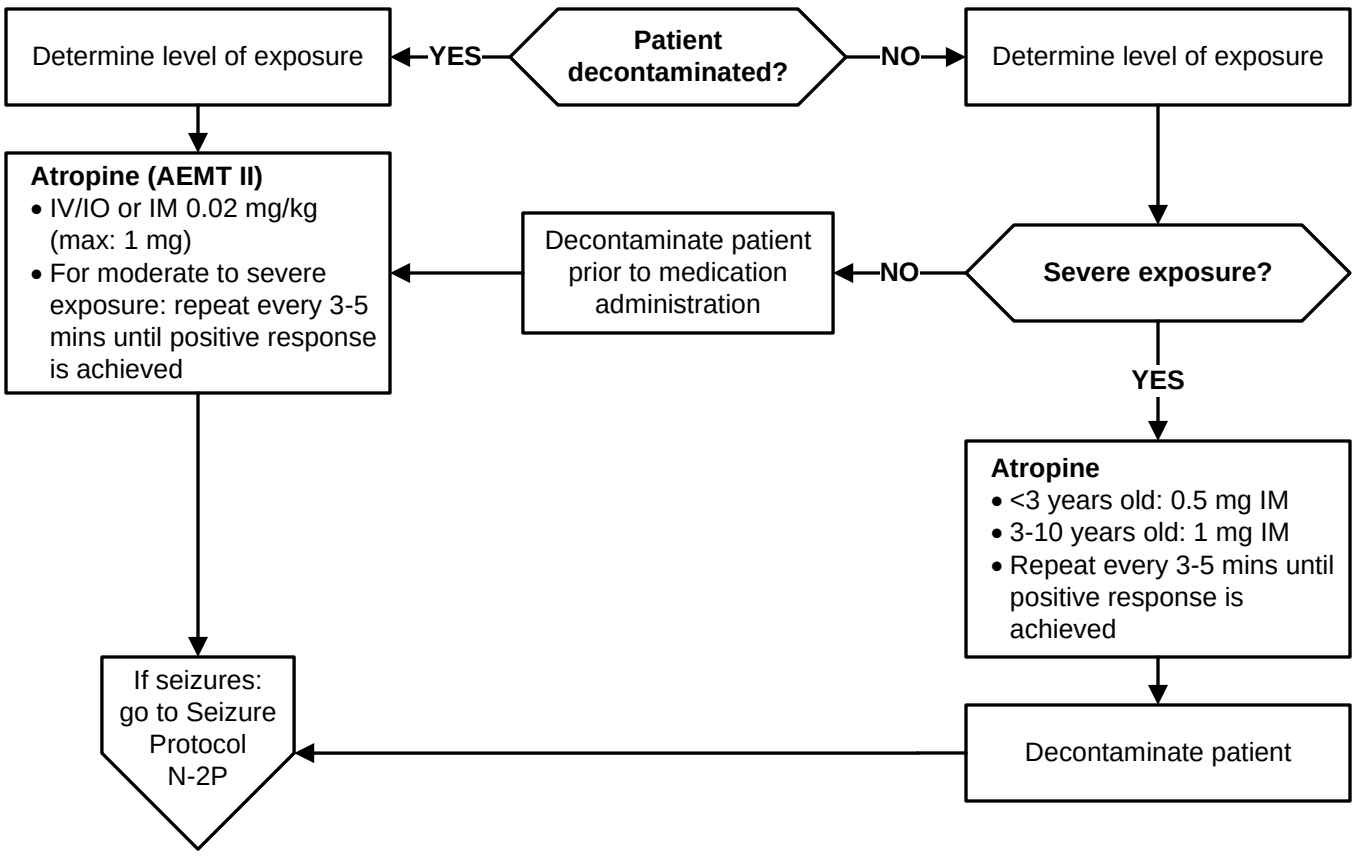
| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-5P (LALS) |
|---|---|
| **Pediatric Ingestions & Overdoses** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |




**SEE PAGE 2 FOR NERVE AGENT/ORGANOPHOSPHATE TREATMENT**

# PEDIATRIC NERVE AGENT/ORGANOPHOSPHATE TREATMENT

- EMS personnel shall not enter or provide treatment in the Contamination Reduction Zone (Warm Zone) or Exclusion Zone (Hot Zone) unless specifically trained, equipped and authorized to do so
- EMS personnel shall not use Haz Mat specific personal protective equipment (PPE), including self-contained breathing apparatus (SCBA), unless specifically trained, fit tested and authorized to do so
- Do not transport patients until they have been completely decontaminated; if transport personnel become contaminated, they shall immediately undergo decontamination
- Only patients with severe exposure will be treated within the Contamination Reduction Zone (Warm Zone) or Exclusion Zone (Hot Zone) by personnel who have specific training to allow them to function in that area
- Patients in the Exclusion Zone (Hot Zone) with severe exposure shall be treated with IM medication only
- Early base hospital contact, and CHEMPACK activation when appropriate (S-SV EMS Nerve Agent Treatment Protocol E-8), will maximize assistance from necessary resources
- Adult auto-injectors are NOT to be used in children <40 kg



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-8P (LALS) |
|---|---|
| **Pediatric Pain Management** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

- All pts with a report of pain shall be appropriately assessed & treatment decisions/interventions shall be adequately documented on the PCR.
- A variety of pharmacological and non-pharmacological interventions may be utilized to treat pain. Consider the pt's hemodynamic status, age, and previous medical history/medications when choosing analgesic interventions.
- Treatment goals should be directed at reducing pain to a tolerable level; pts may not experience complete pain relief.

## BLS

- Assess V/S including pain scale & $SpO_2$, every 15 mins or as indicated by pt's clinical condition
- Assess/document pain score using standard 1-10 pain scale before and after each pain management intervention and at a minimum of every 15 mins
- $O_2$ at appropriate rate if $SpO_2$ <94% or pt is short of breath
- Utilize non-pharmacological pain management techniques as appropriate, including:
  - Place in position of comfort and provide verbal reassurance to minimize anxiety
  - Apply ice packs &/or splints for pain secondary to trauma

**Pain not effectively managed with non-pharmaceutical pain management techniques**

**Pain related to acute injury/ burns/frostbite?**

**NO** →
- Contact base/modified base hosp. for pain management consultation
- May proceed with LALS treatment in the event of communication failure, if indicated by pt's condition

**YES**

## LALS

- Continuous cardiac & EtCO2 monitoring if administering fentanyl &/or midazolam
- IV/IO NS TKO – if indicated by pt's clinical condition or necessary for medication administration
  - May bolus up to 20 mL/kg if indicated by pt's clinical condition

**Fentanyl (AEMT II):** 1 mcg/kg slow IV/IO or IM/IN (max: 50 mcg) – may repeat every 5 mins (max 4 doses)
**If pain not effectively managed:**
**Midazolam (AEMT II):** 0.05 mg/kg slow IV/IO (max single dose: 1 mg) – may repeat after 5 min (max: 2 doses)

## Fentanyl/Midazolam Contraindications & Administration Notes

- ⓘ Administer fentanyl/midazolam IV/IO doses over 60 seconds
- ⓘ Do not administer fentanyl/midazolam to pts with any of the following:
  - Hypotension (see Pediatric Hypotension Table)
  - SpO2 <94% or RR <12
  - ALOC or suspected moderate/severe TBI
- ⓘ There is an increased risk of deeper level sedation & airway/ respiratory compromise when administering midazolam to pts receiving fentanyl

**Pediatric Normal SBP & Hypotension Table**

| Age | Normal SBP | Hypotension |
|---|---|---|
| 1-12 mos | 70-100 | SBP <70 |
| 1-2 yrs | 80-110 | SBP <70 + age (yrs) x 2 |
| 3-5 yrs | 90-110 | |
| 6-9 yrs | 100-120 | |
| 10-14 yrs | 100-120 | SBP <90 |

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | M-11P (LALS) |
|---|---|
| **Pediatric Behavioral Emergencies** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

- Pediatric behavioral emergencies occur when the presenting problem includes some disorder of thought or behavior that is disturbing or dangerous to the pt or others. Psychiatric emergencies are a subset of behavioral emergencies.
- Crisis in pediatrics may be precipitated by social factors and/or instability in the home or community.
- Avoid judgmental statements and encourage pt to help with their own care.
- Consider dimming the lights and removing non-essential adults when appropriate.
- Assess for the presence of other conditions that may mimic behavioral emergencies, for example:
  - Diabetes/hypoglycemia - Trauma/TBI - Seizure disorders - Hypoxia - Ingestion/Overdose
- Major psychiatric disorders that may predispose to behavioral emergencies in children include:
  - Mood disorders (Depression, Bipolar Disorder) - Thought disorders (Schizophrenia)
  - Developmental disorders (Autism) - Anxiety disorders (PTSD)
  - Other disorders (ADD, ADHD, Oppositional Defiant Disorder, Reactive Attachment Disorder, etc.)

## BLS

- Identify yourself to pt & limit the number of providers interacting with pt (if appropriate)
- Obtain history from child (if appropriate) & family members
- Assess V/S, including $SpO_2$ and temperature (if able)
- Assess/treat for underlying medical/traumatic causes
- Check blood glucose (if able)
- Utilize appropriate restraint mechanisms in situations where the pt is violent, potentially violent, or exhibiting behavior that is dangerous to self or others (Reference: S-SV EMS policy 852)

**Blood glucose ≤60 mg/dl?**

**YES** → Go to ALOC Protocol N-1P

**NO**

**Ingestion Suspected?**

**YES** → Go to Ingestions & Overdoses Protocol M-5P

**NO**

## LALS

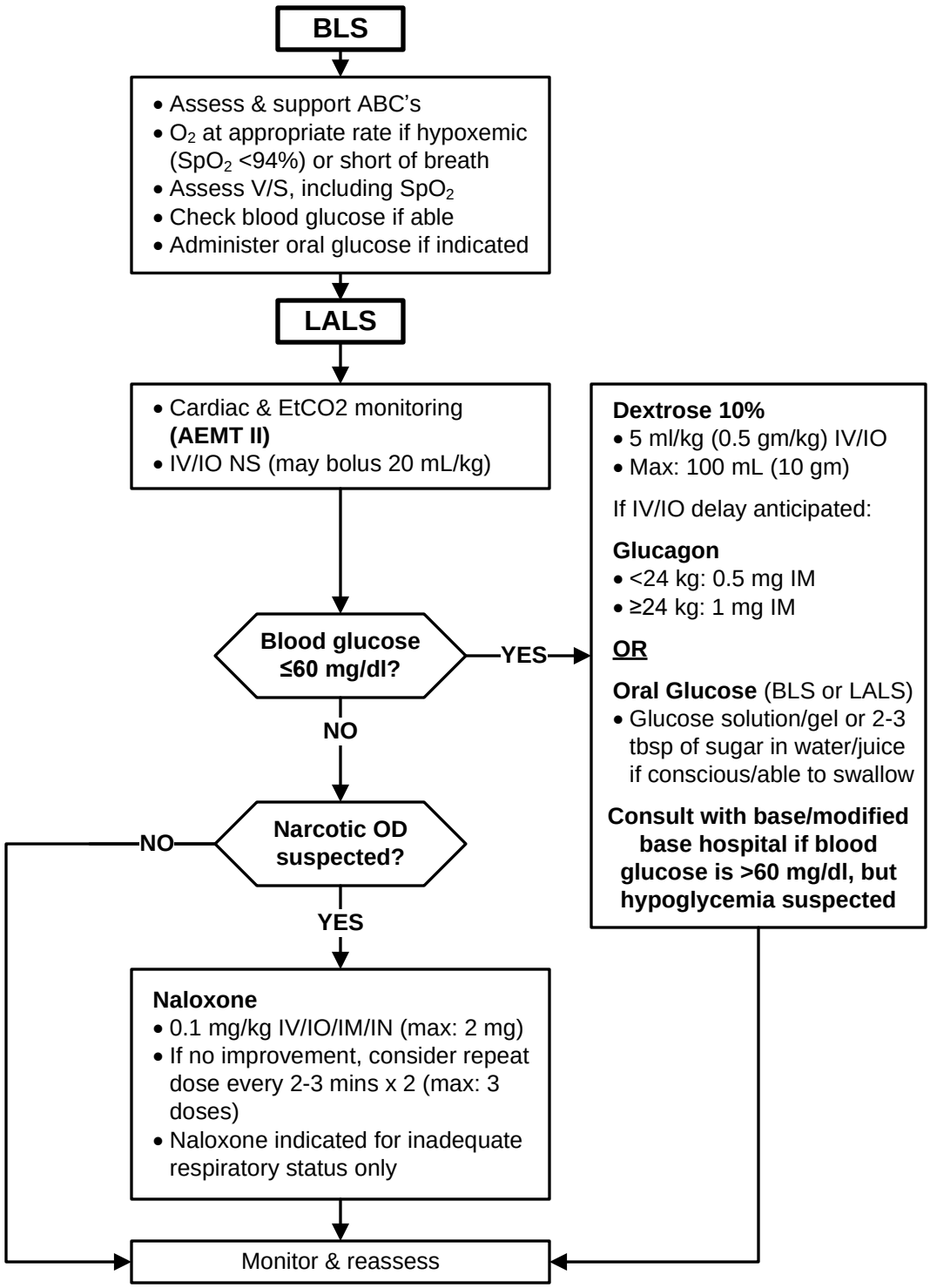
- Consider cardiac and $EtCO_2$ monitoring **(AEMT II)** (required if administering midazolam)
- Consider IV/IO NS TKO

**Severe anxiety/combative symptoms not adequately relieved by other means (for pts ≤ 4 yo, consult with base/modified base hospital prior to administration of midazolam):**

**Midazolam (AEMT II)**

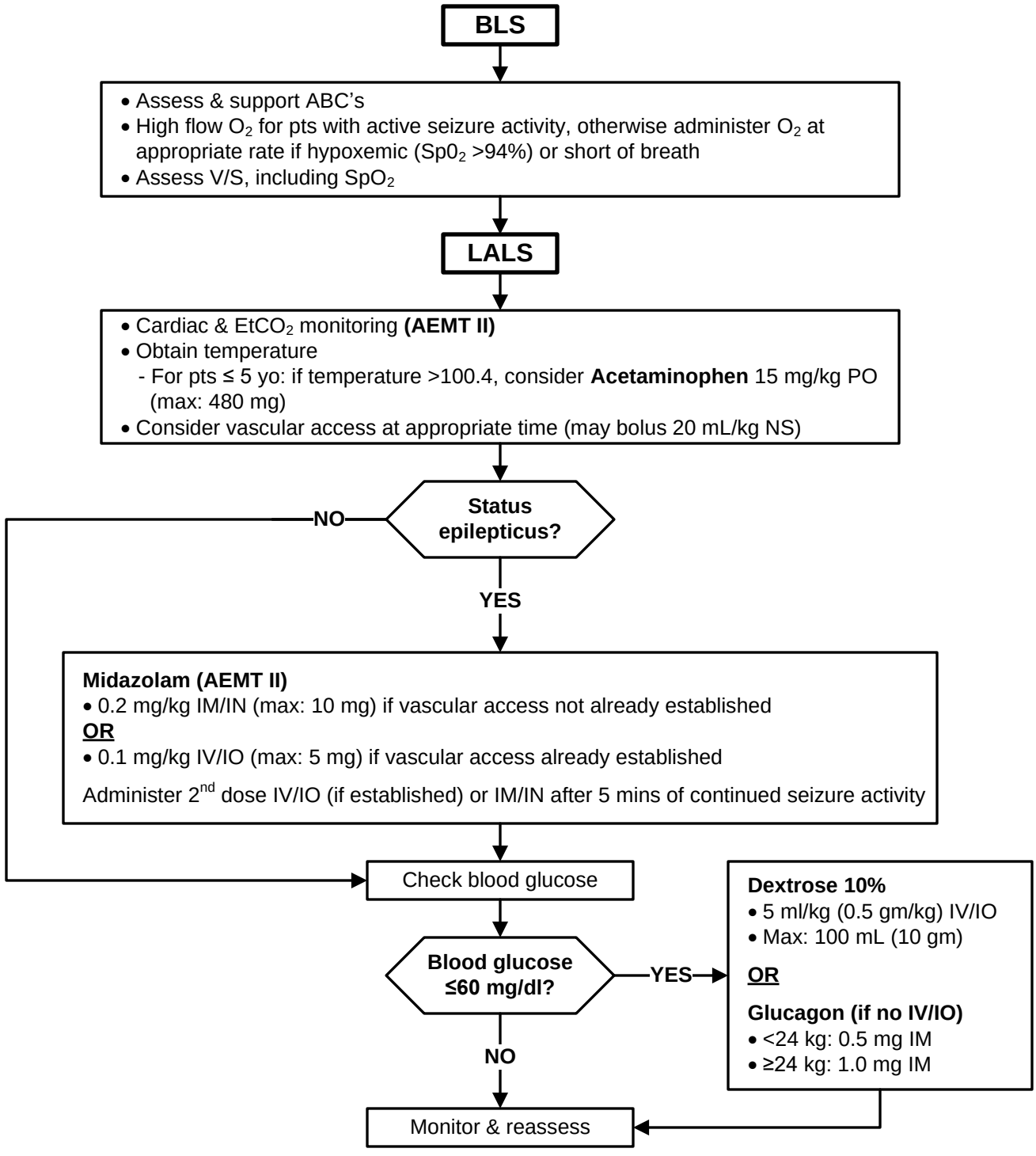
- 0.05 mg/kg IV/IO/IM/IN (max. dose: 1 mg) – may repeat dose x1 after 5 mins if symptoms persist

| Sierra – Sacramento Valley EMS Agency Treatment Protocol | N-1P (LALS) |
|---|---|
| **Pediatric Altered Level Of Consciousness** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | N-2P (LALS) |
|---|---|
| **Pediatric Seizure** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

- **Febrile:** Cooling measures: loosen clothing and/or remove outer clothing/blankets.
- **Status Epilepticus:** 2 or more seizures without periods of consciousness, or a single seizure lasting >5 mins.
- Only continuous or repetitive seizure activity requires ALS intervention.



| Sierra – Sacramento Valley EMS Agency Treatment Protocol | T-3P (LALS) |
|---|---|
| **Pediatric Suspected Moderate/Severe Traumatic Brain Injury (TBI)** | |
| Approval: Troy M. Falck, MD – Medical Director | Effective: 06/01/2024 |
| Approval: John Poland – Executive Director | Next Review: 04/2027 |

**Prehospital Identification of Moderate/Severe TBI**

- Any pt with a mechanism of injury consistent with a potential for a brain injury, and one or more of the following:
  - GCS <13 (in infants: any decreased responsiveness, deterioration of mental status, irritation or agitation)
  - Post-trauma seizures, whether continuing or not
  - Multi-system trauma requiring advanced airway placement

**For any patient with a suspected moderate/severe TBI, avoid/treat the three TBI "H-Bombs":**
1) **H**yperventilation, 2) **H**ypoxia, 3) **H**ypotension

**BLS**

- Assess V/S, including continuous $SpO_2$ monitoring and pupil exam: Reassess V/S every 3-5 min if possible
- High-flow $O_2$ (regardless of $SpO_2$ reading)
- If continued hypoxia ($SpO_2$ <94%) or inadequate ventilatory effort, proceed through the following in a stepwise manner:
  - Reposition airway
  - Initiate positive pressure ventilation with appropriate airway adjunct if necessary (use of a pressure-controlled BVM &/or ventilation rate timer is recommended if available)
- Avoid hyperventilation
  - Infant (0-24mo) ventilation rate: 25 breaths/min
  - Pediatric (2-14yo) ventilation rate: 20 breaths/min
- Maintain normothermia
- Consider the concurrent need for appropriate immobilization/spinal motion restriction

**LALS**

- Continuous cardiac & $EtCO_2$ monitoring **(AEMT II)**
- IV/IO NS TKO: For hypotension, bolus 20 mL/kg, repeat bolus until hypotension resolves
- Check blood glucose

**Blood glucose ≤60 mg/dl?**

YES →

**Dextrose 10%**
- 5 ml/kg (0.5 gm/kg) IV/IO
- Max: 100 mL (10 gm)

**OR**

**Glucagon**
- <24 kg: 0.5 mg IM
- ≥24 kg: 1 mg IM

NO ↓

**For persistent hypoxia &/or inadequate ventilatory effort:**
- Supraglottic airway
- Target EtCO2: 35-39 mmHg

- Transport to appropriate destination & notify receiving facility of a "Trauma Alert" as soon as possible (if applicable)
- Monitor & reassess