

PEDIATRIC CARDIAC ARREST

Effective: January 1, 2024
Replaces: January 1, 2023

1. BLS Treatment

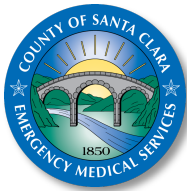
- 1.1. If patient shows signs of obvious death (**Policy 600**), do not resuscitate
- 1.2. Confirm status of DNR / POLST / End of Life Option Act, if possible
 - 1.2.1. Do not delay care and/or CPR while confirmation is being made (**Policy 604**)
- 1.3. Address any areas of significant blood loss with hemorrhage control measures, regardless of any active bleeding or hemorrhage (**700-M17**)
 - 1.3.1. Apply tourniquet(s) proximal to any large wound, laceration, or amputation of the extremities, regardless of any active bleeding or hemorrhage
- 1.4. **Apply Spinal Motion Restriction (SMR) if indicated (700-M11)**
- 1.5. If traumatic cardiac arrest is suspected **initiate transport to appropriate receiving trauma center**, all remaining care to be completed en route to trauma center (**Policy 602**).
- 1.6. High quality uninterrupted CPR (**700-S01**)
- 1.7. Routine Medical Care – Pediatric (**700-S05**)
- 1.8. **Supraglottic airway device** (LMA Supreme)
 - 1.8.1. If Supraglottic airway attempts fail:
 - 1.8.1.1. **Oropharyngeal airway (OPA)**
- 1.9. **BVM** – Ventilate once every three seconds (1:3), with supplemental oxygen
- 1.10. **Apply AED** and follow device instructions

2. ALS Treatment

- 2.1. Place patient on cardiac monitor and treat accordingly
 - 2.1.1. If the traumatic arrest patient is asystolic on initial contact, do not resuscitate
- 2.2. If traumatic cardiac arrest is suspected **initiate transport to appropriate receiving trauma center**, all remaining care to be completed en route to pediatric trauma center
- 2.3. **Supraglottic airway device** (LMA Supreme)
 - 2.3.1. If Supraglottic airway attempt fails:
 - 2.3.1.1. **Oropharyngeal airway (OPA)**
- 2.4. **EtCO₂** continuous numeric and waveform monitoring on every airway adjunct
- 2.5. **Vascular Access (IV) or (IO)**

3. Ventricular Fibrillation and Pulseless Ventricular Tachycardia

- 3.1. **Defibrillation: 2 joules/kg, 4 joules/kg, 4 joules/kg**
 - 3.1.1. Starting with lowest energy setting (2 joules/kg)
 - 3.1.2. Each subsequent shock at 4 joules/kg
- 3.2. **Epinephrine (1:10,000) 0.01 mg/kg IV / IO**, repeat every 3-5 minutes for the duration of the arrest (Epinephrine is not indicated in traumatic cardiac arrest with hypovolemia from exsanguinating hemorrhage)
- 3.3. **Amiodarone 5mg/kg IV / IO**, single dose only
- 3.4. **BASE CONTACT**: Consult for further instruction on Amiodarone dosages, if there is a successful conversion to a sustained pulsatile rhythm or (ROSC)



4. Asystole (Non-Traumatic)

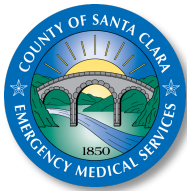
- 4.1. **Epinephrine (1:10,000) 0.01 mg/kg IV / IO**, repeat every 3-5 minutes for the duration of the arrest
- 4.2. Provider may consider termination of resuscitative efforts after a total of at least twenty (20) minutes of EMS provider resuscitation if:
 - 4.2.1. Arrest was not witnessed by the EMS provider
 - 4.2.2. No return of spontaneous circulation (ROSC) prior to transport

5. Pulseless Electrical Activity (PEA)

- 5.1. Identify and treat any reversible causes:
 - 5.1.1. **Hypovolemia:** Reassess any hemorrhage control interventions to ensure they are adequately addressing blood loss and reapply if necessary **(700-M17)**. Consider a **20 ml/kg Fluid bolus**, repeat once if needed **(700-P10)**
 - 5.1.2. **Hypoxia:** Ensure that the patient is adequately ventilated, utilizing an airway adjunct and bag valve mask with a supplemental oxygen supply
 - 5.1.2.1. Ensure proper chest rise and fall
 - 5.1.2.2. Reassess any sucking chest wounds or flail segment interventions
 - 5.1.3. **Hyperkalemia:** Peaked T-waves, with possible widening of the QRS complex
 - 5.1.3.1. Consider **Calcium Chloride 10mg/kg IV / IO**, max dose 1gm
 - 5.1.3.2. Flush the IV tubing well between injections
 - 5.1.3.3. Consider **Sodium Bicarbonate 1mEq/kg IV/ IO**, max dose 50mEq
 - 5.1.4. **Tension Pneumothorax:** If tension pneumothorax is suspected or the patient has a traumatic injury to the chest, perform bilateral pleural decompression if not already completed. **(700-M02)**
- 5.2. **Epinephrine (1:10,000) 0.01 mg/kg IV / IO**, may repeat every 3-5 minutes for the duration of the arrest (Epinephrine is not indicated in traumatic cardiac arrest with hypovolemia from exsanguinating hemorrhage)
- 5.3. Treat any rhythm changes according to correct treatment protocol.
 - 5.3.1. If the PEA changes to asystole, the provider may follow the criteria in section 4.2.

6. Hypothermic Cardiac Arrest

- 6.1. Assess pulse for 45 seconds
- 6.2. If no pulse is present, **Start CPR**
- 6.3. If defibrillation is indicated, limit to one (1) shock until patient is warm
- 6.4. If patient presents with dysrhythmias, treat as appropriate.
- 6.5. If core temperature less than 86°F, withhold IV medications until temperature rises
- 6.6. Consider rewarming measures **(700-A09)**
 - 6.6.1. Patients that are hypothermic can be unresponsive to pharmaceutical therapy and electrical therapy and should be transported with CPR and warming measures



7. Ventricular Assist Device (VAD) Cardiac Arrest

- 7.1. High quality uninterrupted CPR (**700-S01**) may be provided if:
 - 7.1.1. Patient is unresponsive, apneic and there is a device failure alarm with no rotor hum upon auscultation
 - 7.1.2. **Mechanical CPR devices are contraindicated**
- 7.2. If there is presence of rotor hum with no failure alarm, continue with airway management, do not perform chest compressions (**700-M01**)
- 7.3. Defibrillation(s) by manual defibrillator or AED may only be delivered if the patient is unresponsive
- 7.4. Any VAD patient in cardiac arrest, that does not meet obvious death criteria (**Policy 600**) shall be transported to:
 - 7.4.1. Either Kaiser Santa Clara or Stanford Hospital
- 7.5. Treat the cardiac arrest VAD patient with the guidelines found in the Ventricular Assist Device protocol (**700-S11**)
- 7.6. If further guidance is required during patient care, make **BASE CONTACT**

8. Pregnant Cardiac Arrest

- 8.1. Any pregnant patient beyond 20 weeks gestation (uterine fundus palpated at or above the umbilicus) in cardiac arrest, that does not meet obvious death criteria (**Policy 600**) shall be transported to:
 - 8.1.1. Either Stanford Hospital or Santa Clara Valley Medical Center (for potential resuscitative hysterotomy)

9. Drowning or Mechanical Asphyxiation

- 9.1. Any drowning or mechanical asphyxiation patient, in cardiac arrest, with suspected head or spinal injury shall be transported to a pediatric trauma Center (**Policy 602**)
- 9.2. If head or spinal injury is not suspected, transport to a pediatric receiving center (**Policy 602**)

10. Traumatic Cardiac Arrest

- 10.1. **Initiate Immediate Transport to appropriate receiving trauma center**, all care to be completed en route to pediatric trauma center (**Policy 602**).
- 10.2. Epinephrine is not indicated in traumatic cardiac arrest with hypovolemia from exsanguination; otherwise epinephrine can be used in traumatic cardiac arrest

11. Return of Spontaneous Circulation (ROSC)

- 11.1. If any Return of Spontaneous Circulation (ROSC) occurs,
 - 11.1.1. If systolic blood pressure is less than ninety (90) mmHg (age 10 and older), or less than 70 mmHg + 2x age years (age 0-9)
 - 11.1.1.1. **20 ml/kg Fluid bolus**
 - 11.1.1.2. **Dopamine 5 – 10 mcg/kg/min IV**, titrate to SBP greater than 90 mmHg (age 10 and older), or greater than 70 mmHg + 2x age years (age 0-9)
 - 11.1.2. Continue ventilations at a rate and volume to keep ET_{CO2} between 30-40 mmHg
 - 11.1.3. Obtain a quality **12 Lead ECG (700-M09)**
 - 11.1.4. If wide complex tachycardia, perform **synchronized cardioversion (700-P14)**
 - 11.1.5. **Blood Glucose Level**, readings of less than 60mg/dl require interventions
 - 11.1.6. Transport to closest Advanced Pediatric Receiving Center, unless a traumatic cardiac arrest



12. Treatment Flow Charts

