



County of Santa Clara
Emergency Medical Services System
ADMINISTRATIVE ORDER

Number:	AO 2025-004
Issued:	February 27, 2025
Title:	Immediate change to EMS Policy 700-A07 – Cardiac Arrest
Effective:	March 3, 2025 8:00AM

I. Declaration

The Santa Clara County Emergency Medical Services (EMS) Agency has determined that an immediate change is necessary to EMS Policy 700-A07 – CARDIAC ARREST. Consistent with *Santa Clara County Prehospital Care Policy 109: Policy Development and Implementation*, the EMS Director, or designee, may issue Administrative Orders when immediate changes are necessary.

II. Statement of Change and Rationale

A change to protocol 700-A07 has been made to clarify treatment for patients in cardiac arrest due to traumatic injury. If a patient becomes asystolic in traumatic cardiac arrest prior to transport, the provider can consider termination of resuscitation.

Execution

Administrative Order # 2025-004 is in effect as of March 3, 2025 at 8:00AM. This Administrative Order will remain in effect until further notice.



Ken Miller, MD, PhD
EMS Medical Director



Nicholas Clay,
EMS Agency Director

Please direct any questions to Dustin Gonzalez, EMS Specialist by phone at 408.794.0643, or via email at Dustin.Gonzalez@ems.sccgov.org.



CARDIAC ARREST

Effective: March 3, 2025
Replaces: January 1, 2025

1. Patient Care Goals

- 1.1. Return of spontaneous circulation (ROSC)
- 1.2. Preservation of neurologic function
- 1.3. High-quality chest compressions/CPR with minimal interruption from recognition of cardiac arrest until confirmation of ROSC or field termination of resuscitative efforts
- 1.4. Recognition and treatment of reversible causes of cardiac arrest
- 1.5. For medical (non-traumatic) causes of cardiac arrest without obvious signs of death, 20 minutes of resuscitation efforts on-scene prior to making transport decision
- 1.6. Treatment consistent with patient's wishes as documented in Advanced Health Care Directives, POLST or DNR orders

2. BLS Treatment

- 2.1. If patient shows signs of obvious death (**Policy 600**), do not resuscitate
- 2.2. Confirm status of DNR / POLST / End of Life Option Act, if possible
 - 2.2.1. Do not delay care and/or CPR while confirmation is being made (**Policy 604**)
- 2.3. Address any areas of significant blood loss with hemorrhage control measures, regardless of any active bleeding or hemorrhage (**700-M17**)
 - 2.3.1. Apply tourniquet(s) proximal to any large wound, laceration, or amputation of the extremities, regardless of any active bleeding or hemorrhage
- 2.4. **Apply Spinal Motion Restriction (SMR) if indicated (700-M11)**
- 2.5. If traumatic cardiac arrest is suspected **initiate transport** to appropriate trauma center, all remaining care to be completed en route to trauma center (**Policy 602**).
- 2.6. High quality uninterrupted CPR (**700-S01**)
 - 2.6.1. Mechanical CPR devices are always prohibited in traumatic arrests and in non-traumatic arrest unless the patient will be transported during CPR (**700-M13**)
- 2.7. Routine Medical Care – Adult (**700-S04**)
- 2.8. **Supraglottic airway device** (LMA Supreme)
 - 2.8.1. If Supraglottic airway attempts fail:
 - 2.8.1.1. **Oropharyngeal airway (OPA)**
- 2.9. **BVM** – Ventilate once every six seconds (1:6), with supplemental oxygen
- 2.10. **Apply AED** and follow device instructions

3. ALS Treatment

- 3.1. Place patient on cardiac monitor and treat accordingly
 - 3.1.1. If the traumatic arrest patient is asystolic on initial contact, do not resuscitate
- 3.2. 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**).
- 3.3. **Endotracheal Tube (ETT) with Bougie**, at least one attempt (**700-M01**)
 - 3.3.1. If ETT attempt(s) fail:
 - 3.3.1.1. **Supraglottic airway device** (LMA Supreme)
 - 3.3.2. If both ETT and Supraglottic airway attempts fail:



3.3.2.1. **Oropharyngeal airway (OPA)**

- 3.4. **Apply ETCO₂** continuous numeric and waveform monitoring as soon as possible, ETCO₂ values less than 10mmHg ensure CPR rate, depth and chest recoil is adequate
- 3.5. **Vascular Access (IV) or Vascular Access (IO)**, per procedure **(700-M13)**

4. Ventricular Fibrillation and Pulseless Ventricular Tachycardia

- 4.1. **Defibrillation at manufacturer's suggested values (example: 100, 150, 200 joules)**
 - 4.1.1. Starting with lowest energy setting
 - 4.1.2. Each subsequent counter shock increasing in energy
- 4.2. **Epinephrine (1:10,000) 1mg 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)
- 4.3. **Amiodarone 300mg IV / IO**
 - 4.3.1. If after 5 minutes rhythm remains refractory, **Amiodarone 150mg IV / IO**, for a max cumulative dose of 450mg

5. Asystole (Non-Traumatic)

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

6. Pulseless Electrical Activity (PEA)

- 6.1. Identify and treat any reversible causes:
 - 6.1.1. **Hypovolemia:** Reassess any hemorrhage control interventions to ensure they are adequately addressing blood loss and reapply if necessary **(700-M17)**. Consider a rapid **500ml Fluid bolus**, repeat once if needed **(700-A10)**
 - 6.1.2. **Hypoxia:** Ensure that the patient is adequately ventilated, utilizing an airway adjunct and bag valve mask with a supplemental oxygen supply
 - 6.1.2.1. Ensure proper chest rise and fall
 - 6.1.2.2. Reassess any sucking chest wounds or flail segment interventions
 - 6.1.2.3. If there is question of endotracheal tube placement (esophageal intubation), provider should extubate the patient and return to a BLS airway
 - 6.1.3. **Hyperkalemia:** Peaked T-waves, with possible widening of the QRS complex
 - 6.1.3.1. Consider **Calcium Chloride 10mg/kg IV / IO**, max dose 1gm
 - 6.1.3.2. Flush the IV tubing well between injections
 - 6.1.3.3. Consider **Sodium Bicarbonate 1mEq/kg IV/ IO**, max dose 50mEq
 - 6.1.4. **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)**
- 6.2. **Epinephrine (1:10,000) 1mg 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)
- 6.3. Treat any rhythm changes according to correct treatment protocol.
 - 6.3.1. If the PEA changes to asystole, the provider may follow the criteria in section 4.2.



7. Hypothermic Cardiac Arrest

- 7.1. Assess pulse for 45 seconds
- 7.2. If no pulse is present, **Start CPR**
- 7.3. If defibrillation is indicated, limit to one (1) shock until patient is warm
- 7.4. If patient presents with dysrhythmias, treat as appropriate but withhold IV medications until patient's temperature rises above 86°F
- 7.5. Consider rewarming measures (**700-A09**)
 - 7.5.1. Patients that are hypothermic can be unresponsive to pharmaceutical therapy and electrical therapy and should be transported with CPR and warming measures

8. Ventricular Assist Device (VAD) Cardiac Arrest

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

9. Pregnant Cardiac Arrest

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 either Stanford Hospital or Santa Clara Valley Medical Center (for potential resuscitative hysterotomy)

10. Drowning or Mechanical Asphyxiation

- 10.1. Any drowning or mechanical asphyxiation patient, in cardiac arrest, with suspected head or spinal injury shall be transported to a Trauma Center (**Policy 602**)
 - 10.1.1. Hanging - suspended (feet not touching the ground) at time of discovery
 - 10.1.2. Drowning secondary to diving or unwitnessed drowning
- 10.2. If head or spinal injury is not suspected, transport to the closest hospital (**Policy 602**)

11. Traumatic Cardiac Arrest

- 11.1. **Initiate Immediate Transport to appropriate receiving trauma center**, all care to be completed enroute to trauma center (**Policy 602**).
- 11.2. Epinephrine is not indicated in traumatic cardiac arrest with hypovolemia from exsanguination; otherwise, epinephrine can be used in traumatic cardiac arrest
- 11.3. Consider pelvic binding (if available) for suspected pelvic fracture (**700-A17**)
- 11.4. Consider Tranexamic Acid (TXA) when suspected hemorrhagic shock after return of Spontaneous Circulation (ROSC) occurs (**700-M17**)
- 11.5. If a patient becomes asystolic prior to transport, consider termination of resuscitation efforts



11.5.1. Once transport has begun, resuscitation efforts must continue until transfer of care at destination

12. Return of Spontaneous Circulation (ROSC)

- 12.1. If any Return of Spontaneous Circulation (ROSC) occurs,
 - 12.1.1. If systolic blood pressure is less than ninety (90) mmHg,
 - 12.1.1.1. **500ml Fluid bolus**
 - 12.1.1.2. **Dopamine 10–20 mcg/kg/min IV**, titrate to SBP greater than 90 mmHg
 - 12.1.2. Continue ventilations at a rate and volume to keep ETCO₂ between 30-40 mmHg
 - 12.1.3. Obtain a quality **12 Lead ECG (700-M09)**
 - 12.1.4. If wide complex tachycardia, perform **synchronized cardioversion (700-A14)**
 - 12.1.5. Transport to closest STEMI receiving center, unless a traumatic cardiac arrest

13. Pertinent Assessment Findings

- 13.1. Obvious signs of death (**Policy 600**)
- 13.2. Evidence of STEMI after ROSC
- 13.3. Reversible causes of cardiac arrest
 - 13.3.1. Hypoxia
 - 13.3.2. Hypovolemia
 - 13.3.3. Hypothermia
 - 13.3.4. Hypo-/hyperkalemia
 - 13.3.5. Tension Pneumothorax
 - 13.3.6. Toxins (e.g. tricyclic antidepressants, beta blockers, opioids)
- 13.4. ETCO₂ lower than 10mmHg despite high quality CPR

14. Key Documentation Elements

- 14.1. Resuscitation attempted and all interventions performed
- 14.2. Arrest witnessed
- 14.3. Location of arrest
- 14.4. First monitored ECG rhythm
- 14.5. CPR prior to EMS arrival
- 14.6. Outcome upon arrival at hospital
- 14.7. Any ROSC
- 14.8. Presumed cardiac arrest etiology



15. Treatment Flow Charts





