

**County of Santa Clara
Emergency Medical Services System**



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Date: June 27, 2018
To: EMS System Stakeholders
From: David Sullivan *D.S.*
County of Santa Clara
Subject: Prehospital Care Policy Revisions and Open Comment Period

Consistent with *Santa Clara County Emergency Medical Services Prehospital Care Policy 109 - Policy Development and Implementation*, the EMS Agency announces prehospital care policy changes.

Summary of Changes (with public comment period)

Policy Name/Effective Date	Summary of Change
700-A17: Traumatic Cardiac Arrest Effective: February 12, 2019 Public Comment Ends: July 31, 2018	New policy; draft should be reviewed in its entirety.
700-M17: Hemorrhage Control Effective: February 12, 2019 Public Comment Ends: July 31, 2018	Draft policy should be reviewed in its entirety. It replaces current Policy 700-M17: Tourniquet.
700-S01: Santa Clara County Continuous Cardiopulmonary Resuscitation Effective: February 12, 2019 Public Comment Ends: July 31, 2018	Draft policy should be reviewed in its entirety. It codifies best practices and replaces current Protocol 700-S01: Cardio-Pulmonary Resuscitation.

Stakeholder comments must be submitted electronically by email to David.Sullivan@ems.sccgov.org, on or before July 31, 2018. All three of these protocols will be part of EMS Update in October 2018.

If you should have any questions or concerns regarding this memorandum, please contact David Sullivan at 408.794.0623 or by email at David.Sullivan@ems.sccgov.org.



TRAUMATIC CARDIAC ARREST

Effective: February 12, 2019
Replaces: New
Review: February 12, 2021

1. BLS Treatment

- 1.1. Treat patient under [\(700-A07\)](#)
- 1.2. **Apply Spinal Motion Restriction (SMR) as indicated (700-M11)**
- 1.3. Ensure rapid transport to closest receiving trauma center unless patient shows signs of obvious death.
- 1.4. Address any areas of significant blood loss prior to arrest with hemorrhage control measures, regardless if the wound or laceration is actively bleeding.
 - 1.4.1. Apply tourniquet(s) to any large wound, laceration or amputation of the extremities, regardless of any active bleeding or hemorrhage. **(700-M17)**

2. ALS Treatment

- 2.1. If non traumatic cardiac arrest is suspected as the cause of the traumatic event, treat the patient under [\(700-A07\)](#)
- 2.2. Place patient on cardiac monitor
 - 2.2.1. If the traumatic arrest patient is asystolic on initial contact, do not attempt resuscitation.
- 2.3. High quality uninterrupted CPR [\(700-S01\)](#)
 - 2.3.1. Mechanical CPR devices are prohibited on traumatic arrests **(700-M13)**
- 2.4. **Endotracheal Tube (ETT) with Bougie**, at least one attempt **(700-M01)**
 - 2.4.1. If ETT attempt(s) fail:
 - 2.4.1.1. **Supraglottic airway device**
 - 2.4.2. If both ETT and Supraglottic airway attempts fail:
 - 2.4.2.1. **Oropharyngeal airway (OPA)**
- 2.5. **EtCO₂** continuous numeric and waveform monitoring on every airway adjunct
- 2.6. **BVM**, ventilate once every six seconds to a total of **10 respirations a minute**.
- 2.7. **Initiate Transport to closest receiving trauma center**, all remaining care to be completed enroute to trauma center (Policy 602).
- 2.8. **Vascular Access (IV) or (IO), (large bore, bilateral access preferred if available), wide open (WO)**
- 2.9. If Return of Spontaneous Circulation (ROSC) occurs after any intervention, **titrate fluids** to maintain a systolic blood pressure of ninety (90), obtain **12 Lead ECG** and continue transport to trauma center.

3. Ventricular Fibrillation and Pulseless Ventricular Tachycardia

- 3.1. **Note: Epinephrine is not indicated in traumatic cardiac arrest.**
- 3.2. **Defibrillation at manufacturer's suggested values (example: 100, 150, 200 joules)**
 - 3.2.1. Starting with lowest energy setting
 - 3.2.2. Each subsequent counter shock increasing in energy
- 3.3. **Amiodarone 300mg IV / IO** if rhythm has not changed after a total of 3 defibrillations
- 3.4. If after 5 minutes rhythm remains refractory:
 - 3.4.1. **Amiodarone 150mg IV / IO**, for a max cumulative dose of 450mg



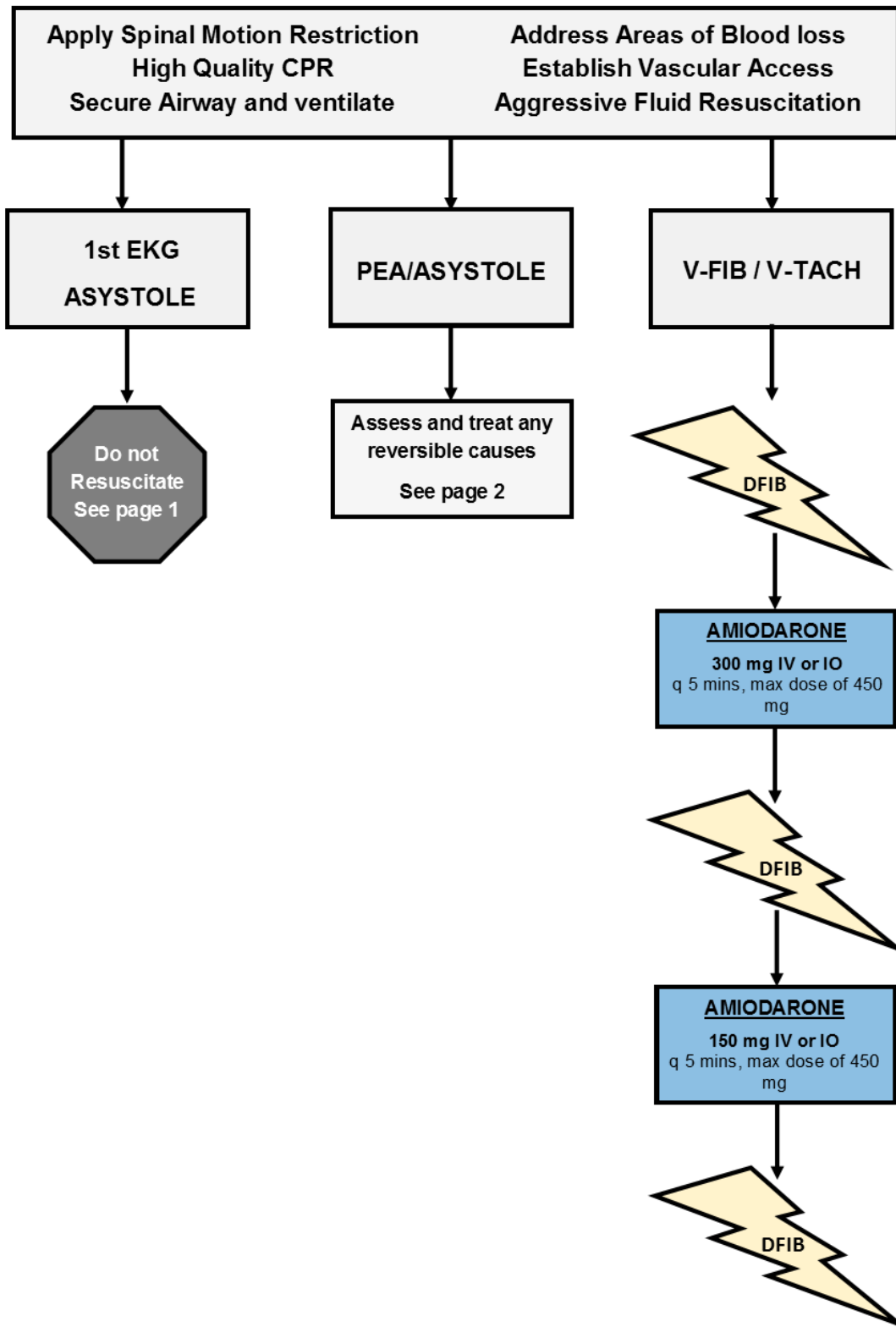
4. Pulseless Electrical Activity and Witnessed Asystole

- 4.1. **Note: Epinephrine is not indicated in traumatic cardiac arrest.**
- 4.2. Identify and treat any reversible causes:
 - 4.2.1. **Hypovolemia:** Reassess any hemorrhage control interventions to ensure they are adequately addressing blood loss and reapply if necessary. Consider a rapid **500ml fluid infusion.**
 - 4.2.2. **Hypoxia:** Ensure that the patient is adequately ventilated
 - 4.2.2.1. Ensure proper chest rise and fall
 - 4.2.2.2. Reassess any sucking chest wounds or flail segment interventions
 - 4.2.2.3. Reassess endotracheal tube position for dislodgment, occlusion or mainstem bronchus location
 - 4.2.3. **Hypothermia:** Consider rewarming measures **(700-A09)**
 - 4.2.3.1. Patients that are hypothermic can be unresponsive to pharmaceutical therapy and electrical therapy
 - 4.2.4. **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)**
- 4.3. Treat any rhythm changes according to correct treatment protocol

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5. Cardiac Arrest Treatment Flow Chart





HEMORRHAGE CONTROL

Effective: February 12, 2019
Replaces: New
Review: February 12, 2021

Patient Eligibility

Hemorrhage control should only be utilized for the management of patients that have an external injury that has damaged arterial or venous blood vessels resulting in large volume blood loss. Hemorrhage control is not intended for the management of smaller lacerations where traditional methods of bleeding control may be effective.

1. Direct Pressure

- 1.1. **Indications:** First-line bleeding control during wound assessment and/or patients with minor to moderate bleeding/hemorrhage. Apply direct pressure using appropriate gauze or dressing to wound. If bleeding becomes controlled, provider may address additional patient issues as needed.
- 1.2. If direct pressure and traditional dressing is insufficient in controlling the bleeding or hemorrhage, continue to wound packing and/or compression bandage.

2. Wound Packing and Compression Bandage (Moderate)

- 2.1. **Indications:** Patients with moderate hemorrhage from extremity lacerations large enough to pack. If wound has major hemorrhage or is too large to pack, go directly to tourniquet.
- 2.2. **Direct Pressure:** Insert finger(s) into laceration and locate the source of the hemorrhage. Apply direct pressure to source of bleeding with finger(s) to slow bleeding.
- 2.3. **Wound Packing:** Pack either gauze or hemostatic impregnated gauze deep inside the wound using the other hand. Continue to pack gauze into the wound creating firm pressure to the source of the bleeding. Remove the fingers holding pressure and continue to pack the wound with gauze until no more gauze can be placed in the wound. This packing should be tight in the wound and fill all voids so pressure is maintained to the source of the bleeding. Once wound has been sufficiently packed continue to compression bandage/emergency bandage.
- 2.4. **Compression Bandage:** Place trauma dressing(s) over the packed wound and apply compression bandage or emergency bandage to affected area. Ensure the bandaging has been tightly placed to insure continuous pressure to the hemorrhage while maintaining the wound packing.
- 2.5. **Reassessment:** Reassess wound every five (5) minutes to ensure hemorrhage has been controlled. If hemorrhage is not controlled proceed to proceed to tourniquet.



3. Tourniquet

- 3.1. **Indications:** Adult or pediatric patient with uncontrolled extremity hemorrhage or major hemorrhages where wound packing and compression bandaging would be insufficient in controlling bleeding.
- 3.2. **Application:** County approved tourniquets shall be applied in accordance to manufactures specifications. Tourniquets may be used in conjunction with wound packing and/or compression dressings or emergency bandages. If compression bandaging or emergency bandaging become insufficient and tourniquet is elected, do not remove bandaging. Once tourniquet has been applied document the time of application.
- 3.3. **Reassessment:** Reassess wound every five (5) minutes to ensure hemorrhage has been controlled.

4. Special Considerations

- 4.1. If a tourniquet has been placed for over two (2) hours, the provider may elect to slowly back off the tourniquet every five (5) minutes. The provider will reassess the wound after every incremental release to ensure the hemorrhage is still controlled. In the event the hemorrhage site starts to bleed after any release, the provider will reapply the tourniquet.

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SANTA CLARA COUNTY CONTINUOUS CARDIOPULMONARY RESUSCITATION

Effective: February 12, 2019
Replaces: April 27, 2017
Review: February 12, 2021

1. Inclusion

- 1.1. Any patient in cardiac arrest.
- 1.2. Pediatric Symptomatic Bradycardia with a heart rate less than 60 BPM. (700-P05)

2. Exclusion

- 2.1. Patients that meet obvious death criteria according to Santa Clara County Prehospital Care Manual Policy 600: Field Pronouncement of Death.

3. Focused Considerations

- 3.1. Scene safety shall be maintained at all times.
- 3.2. Establish position assignments prior to arriving at patient's side whenever possible.
- 3.3. Always use a team approach, first arriving rescuers will own the **BLS CPR**.
- 3.4. Place patient supine and in an environment most accessible to perform CPR, with a ridged surface under the thoracic cavity.
- 3.5. Limit interruptions of chest compressions by performing continuous compressions throughout resuscitation.
- 3.6. Change providers performing compressions every two minutes to ensure depth and quality of compressions is maintained.
- 3.7. Chest compressions shall be performed at a rate of 110 per minute.
- 3.8. Adult chest compressions depth shall equal 2 - 2.4 inches.
- 3.9. Child chest compressions depth shall equal 1/3 the chest size, or about 2 inches.
- 3.10. Infant chest compressions depth shall equal 1/3 the chest size, or 1.5 inches.
- 3.11. Ensure the chest has full recoil after each compression, do not lean on chest.
- 3.12. Ventilations shall be delivered once every six seconds (1:6), or about 10 breaths per minute.

4. Function Descriptions and Duties

4.1. Compressor

- 4.1.1. Responsible for all quality continuous chest compressions with minimal interruptions.
- 4.1.2. Assess responsiveness and pulse.
- 4.1.3. Start continuous chest compressions at 110 BPM.
- 4.1.4. Count compressions out loud.

4.2. Defibrillator

- 4.2.1. Responsible for all defibrillations at the appropriate time with correct joule setting.
- 4.2.2. Power on defibrillator.
- 4.2.3. Apply the pads, If AED is used, follow instructions.
 - 4.2.3.1. Shock immediately if witnessed arrest has occurred.
 - 4.2.3.2. Hold Shock if unwitnessed, to complete two (2) minutes of compressions.
- 4.2.4. If ALS provider, consider establishing IV / IO access and begin administration of medications in the Three Rescuer mode.



4.3. **Ventilator**

- 4.3.1. Responsible for all ventilations at the appropriate tidal volume and time.
- 4.3.2. Insert appropriately sized OPA and NPA.
- 4.3.3. Ventilate using a BVM to initial chest rise on the upstroke of chest compression.
- 4.3.4. Utilize ETCO₂.
- 4.3.5. If ALS, provider will consider ALS Airway placement in the Three Rescuer mode.

4.4. **Coordinator**

- 4.4.1. Serves as the code team leader.
- 4.4.2. Oversees rapid transitions and can alert rescuers of compression fatigue.

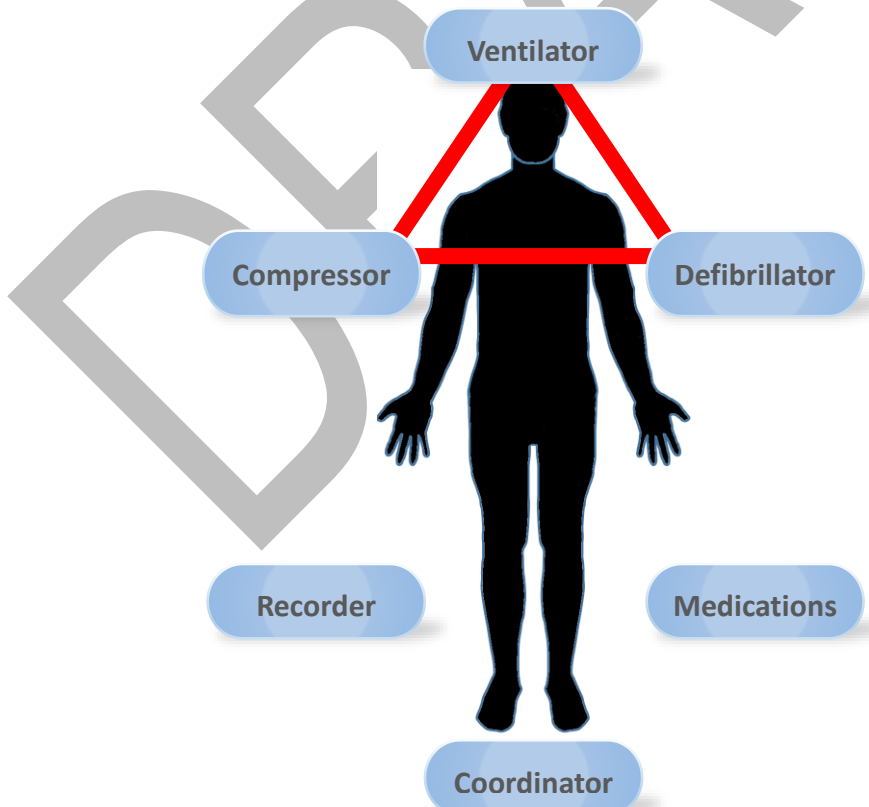
4.5. **Medications**

- 4.5.1. Responsible for establishing and maintaining IV / IO access.
- 4.5.2. Responsible for all drug interventions.
 - 4.5.2.1. Ensure the use of the “6 – Rights of Drug Administration”:
 - 4.5.2.1.1. Right Patient
 - 4.5.2.1.2. Right Drug
 - 4.5.2.1.3. Right Dose
 - 4.5.2.1.4. Right Route
 - 4.5.2.1.5. Right Time
 - 4.5.2.1.6. Right Documentation
 - 4.5.3. Announce each drug intervention taken at the time administered.

4.6. **Recorder**

- 4.6.1. Responsible for all documentation of events and timeline of all actions performed.

5. **Function Diagram**





6. Single Rescuer Mode

- 6.1. The Single Rescuer acts in the following priority:
 - 6.1.1. **Defibrillator – Compressor**
- 6.2. Continue chest compressions until other rescuers arrive.

7. Two Rescuer Mode

- 7.1. In Dual Rescuer mode each will perform Functions in the following priority:
 - 7.1.1. Rescuer 1: **Compressor**
 - 7.1.2. Rescuer 2: **Ventilator and Defibrillator**
- 7.2. Rotate positions after each two (2) minute cycle of compressions.

8. Three Rescuer Mode

- 8.1. With Three (3) Rescuers, each rescuer will take an assignment in the following priority:
 - 8.1.1. Rescuer 1: **Compressor**
 - 8.1.2. Rescuer 2: **Ventilator and Coordinator**
 - 8.1.3. Rescuer 3: **Defibrillator and Medications**
- 8.2. Rotate positions after each two (2) minute cycle of compressions.

9. Four Rescuer Mode

- 9.1. With Four (4) Rescuers, each rescuer will take an assignment in the following priority:
 - 9.1.1. Rescuer 1: **Compressor**
 - 9.1.2. Rescuer 2: **Ventilator**
 - 9.1.3. Rescuer 3: **Defibrillator and Medications**
 - 9.1.4. Rescuer 4: **Coordinator and Recorder**
- 9.2. Rotate positions after each two (2) minute cycle of compressions.

10. Additional Rescuers

- 10.1. Additional Rescuers may be requested as needed for prolonged resuscitation.
- 10.2. Functions in the following priority as more rescuers arrives:
 - 10.2.1. Rescuer 5: **Medications**
 - 10.2.2. Rescuer 6: **Recorder**
 - 10.2.3. Other incoming rescuers arriving should be assigned as Compressor at the two (2) minute cycle switch.

11. Auxiliary Equipment

- 11.1. The use of Capnography Waveform measurements are required at all times when ALS is on scene.
- 11.2. The use of the following devices are encouraged:
 - 11.2.1. Metronome
 - 11.2.2. Mechanical feedback devices
 - 11.2.3. Rate and tidal volume feedback devices

12. Automated CPR Devices

- 12.1. Each county approved CPR device requires specific training, only EMS providers that are trained in the use of such devices may operate or monitor these devices (700-M13).
- 12.2. Do not apply Automated CPR Device until just prior to patient movement or transport.
- 12.3. Device application shall not interrupt High Performance CPR.