



INLAND COUNTIES EMERGENCY MEDICAL AGENCY POLICY AND PROTOCOL MANUAL

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CARDIAC ARREST - ADULT

High performance (HP) CPR is an organized approach to significantly improve the chance of survival for patients who suffer an out-of-hospital cardiac arrest (OHCA). Return of spontaneous circulation (ROSC) is resumption of sustained perfusing cardiac activity associated with significant respiratory effort after cardiac arrest. Signs of ROSC include breathing, coughing, patient movement and a palpable pulse, or a measurable blood pressure without the use of an automatic compression device.

The principles for HP CPR include:

- Minimize interruptions of chest compressions.
- Ensure proper depth of chest compressions of 2" - 2.5" allowing full chest recoil (no leaning on chest).
- Proper chest compression rate at 100 - 120 per minute.
- Avoid compressor fatigue by rotating compressors every two (2) minutes. Ventilations shall be sufficient to cause minimal chest rise, avoiding hyperventilation as it can decrease survival.
- For cardiac arrest related to drowning, refer to ICEMA Reference # 13060- Drowning/Submersion Injuries.

Advanced airways can be safely delayed in OHCA patients until ROSC is achieved if the airway is effectively managed by BLS Interventions. BVM offers excellent oxygenation and ventilation without disrupting high quality compressions.

Base hospital contact is not required to terminate resuscitative measures, if the patient meets criteria set forth below in the Termination of Efforts in the Prehospital Setting.

I. FIELD ASSESSMENT/TREATMENT INDICATORS

Cardiac arrest in a non-traumatic setting.

II. BLS INTERVENTIONS

- Assess patient, begin HP CPR and maintain appropriate BLS airway measures.
- Place patient on AED, if available. To minimize the "hands off" interval before a rhythm analysis/shock, complete chest compression cycle without an added pause for ventilations or pulse check just before rhythm analysis.
- If shock is advised, perform HP CPR compressions while AED is charging. Remove hands from patient and deliver shock then immediately resume uninterrupted HP CPR for two (2) minutes.
- Do not delay HP CPR for post-shock pulse check or a rhythm analysis.
- After two (2) minutes of HP CPR, analyze rhythm using AED while checking for pulse.

III. LIMITED ALS (LALS) INTERVENTIONS

- Perform activities identified in the BLS interventions.

- Establish peripheral intravenous access and administer a 500 ml bolus of normal saline (NS).
- BLS airway with BVM is the airway of choice during active HP CPR.

IV. ALS INTERVENTIONS

- Initiate HP CPR and continue appropriate BLS Interventions while applying the cardiac monitor without interruption to chest compressions.
 - **Note:** Automatic compression device may only be used for non-traumatic cardiac arrest.
- Determine cardiac rhythm and defibrillate if indicated. After defibrillation, immediately begin HP CPR. Begin a two (2) minute cycle of HP CPR.
- Obtain IV/IO access.
- BLS airways should be maintained during active CPR. Endotracheal intubation is the advanced airway of choice if BLS airway does not provide adequate ventilation. Establish advanced airway per ICEMA Reference #11020 - Procedure - Standard Orders without interruption to chest compressions.
- Utilize continuous quantitative waveform capnography, for the monitoring of patients airway, the effectiveness of chest compressions and for possible early identification of ROSC. Document the waveform and the capnography number in mm HG in the ePCR.
NOTE: Capnography **shall** be used for all cardiac arrest patients.
- Insert NG/OG tube to relieve gastric distension per ICEMA Reference #11020 - Procedure - Standard Orders.

Ventricular Fibrillation/Pulseless Ventricular Tachycardia

- Defibrillate at 360 joules for monophasic or biphasic equivalent per manufacture. If biphasic equivalent is unknown use maximum available.
- Perform HP CPR immediately after each defibrillation for two (2) minutes, without assessing the post-defibrillation rhythm.
- Administer Epinephrine per ICEMA Reference #11010 - Medication - Standard Orders every five (5) minutes, without interruption of HP CPR unless capnography indicates possible ROSC.
- Reassess rhythm for no more than ten (10) seconds after each two (2) minute cycle of HP CPR. If VF/VT persists, defibrillate as above.
- After two (2) cycles of HP CPR, consider administering:
Lidocaine per ICEMA Reference #11010 - Medication - Standard Orders, may repeat.
- If patient remains in pulseless VF/VT after 20 minutes of CPR, consult base hospital.

Pulseless Electrical Activity (PEA) or Asystole

- Assess for reversible causes and initiate treatment.
- Continue HP CPR with evaluation of rhythm (no more than 10 seconds) every two (2) minutes.
- Administer fluid bolus of 300 ml NS IV, may repeat.
- Administer Epinephrine per ICEMA Reference #11010 - Medication - Standard Orders every 5 (five) minutes without interruption of HP CPR.
- Base hospital may order the following:
 - Sodium Bicarbonate per ICEMA Reference #11010 - Medication Standard Orders.
 - Calcium Chloride per ICEMA Reference #11010 - Medication Standard Orders.

Stable ROSC

- Obtain a 12-lead ECG, regardless of 12-lead ECG reading, transport to the closest STEMI Receiving Center, per ICEMA Reference #9030 - Destination.
- Monitor ventilation to a capnography value between 35 mm Hg and 45 mm Hg.
- Utilize continuous waveform capnography to identify loss of circulation.
- For persistent profound shock and hypotension, administer Push Dose Epinephrine per ICEMA Reference #11010 - Medication - Standard Orders.
- Base hospital may order the following:
 - For post ROSC agitation, administer Midazolam per ICEMA Reference # 11010- Medication Standard Orders

Termination of Efforts in the Prehospital Setting

- The decision to terminate efforts in the field should take into consideration, first, the safety of personnel on scene, and then family and cultural considerations.
- Consider terminating resuscitative efforts in the field if no ROSC is achieved and capnography waveform reading remains less than 15 mm Hg after 20 minutes of HP CPR with ALS Interventions, and any of the following criteria are met:
 - No shocks were delivered.
 - Arrest not witnessed by EMS field personnel.
 - Persistent asystole, agonal rhythm or pulseless electrical activity (PEA) at a rate of less than 40 bpm.
- If patient has any signs of pending ROSC (i.e., capnography waveform trending upwards, PEA greater than 40 bpm), then consider transportation to a STEMI Receiving Center.
- Contact local law enforcement to advise of prehospital determination of death.
- Provide comfort and care for survivors.

V. REFERENCES

<u>Number</u>	<u>Name</u>
9030	Destination
11010	Medication - Standard Orders
11020	Procedure - Standard Orders
13060	Drowning/Submersion Injuries