EL DORADO COUNTY EMS AGENCY
PREHOSPITAL PROTOCOLS

Effective: July 1, 2014
Reviewed: July 2021
Revised: October 2022
Scope: BLS/ALS – Adult/Pediatric

EMS Agency Medical Director

PULSELESS ARREST – ADULT/PEDIATRIC

PROTOCOL PROCEDURE:

Flow of protocol presumes pulseless arrest is continuing. Priority is effective HP-CPR with minimum interruption. Consider possible cause (H's and T's) and treat accordingly. If correctable cause is suspected or condition changes, refer to appropriate protocol.

Basic Life Support

EMT

1. Ensure scene safety and confirm unresponsiveness.
2. Simultaneously check for pulse and breathing for no more than 10 seconds.
3. Start HP-CPR. Support ventilation with appropriate airway adjuncts.
4. **Prior to defibrillation:** Ensure skin is clean and dry. Remove metal necklaces and underwire bras. Place pads at least 1 inch away from implanted devices or piercings.
5. Perform following steps and repeat until ROSC, until ALS personnel take over, or until patient meets Termination of Resuscitation (TOR) criteria.
   - HP-CPR should be maintained without pause while the AED/defibrillator equipment is being retrieved, applied, and is charging.
   - If shock advised, deliver shock. Immediately resume HP-CPR starting with compressions (goal for pause is <5 seconds).
   - Check pulse and breathing with minimal pause, after 2 minutes of CPR (5 cycles of 30:2)
   - CPR compressors should switch every 2 minutes unless mechanical CPR device is employed.
6. If patient is hypothermic, limit shocks to one (1) only. Refer to **COLD EXPOSURES** protocol.

Return of Spontaneous Circulation (ROSC – see ROSC Protocol):

1. If patient is resuscitated and has:
   - **Effective spontaneous respirations:** Apply high flow oxygen, place patient in left lateral recumbent position and be prepared to suction airway.
   - **Ineffective or absent respirations**: Assist/provide ventilations. Administer 10 ventilations per minute and be prepared to suction airway. **DO NOT HYPERVENTILATE.**
2. Re-assess the patient's vital signs and effectiveness of ventilations frequently.

CONSIDER TERMINATION of RESUSCITATION

1. If EMS did not witness cardiac arrest and
2. No shockable rhythm and
3. No ROSC after 20 minutes of BLS and/or ALS resuscitation **AND** **NOT** hypothermic, victim of submersion, or obviously pregnant.

LOSOP

EMT working under Local Optional Scope

AIRWAY - Consider SGA and ETCO2 (adult only). Do not interrupt CPR for airway insertion.

GLUCOSE LEVEL ASSESSMENT – Via finger stick and treat if indicated.

Advanced Life Support

Paramedic

ADULT

ASYSTOLE/PEA	PULSELESS VT/VF
1) Do 5 cycles of HP-CPR between each pulse check. 2) Establish IV/IO. 3) Give Epinephrine IV/IO: 1 mg 1:10,000 q 3-5 min. Consider SGA. Do not interrupt CPR for airway insertion. Apply ETCO2. 4) Consider Sodium Bicarbonate 1mEq/kg for known dialysis patientor suspected tricyclic OD.	1) Check rhythm. If indicated give 1 shock*, then immediately resume HP-CPR. Repeat shocks q 2 min as indicated for VF/VT. 2) Do 5 cycles of HP-**CPR** between each pulse check. 3) Establish IV/IO. 4) Give Epinephrine 1 mg 1:10,000 IV/IO q 3-5 min. 5) Give antiarrhythmic: a) Amiodarone: 300 mg slow IV/IO over 1-2 minutes. Repeat 5 min after first dose with 150mg slow IV/IO over 1-2 minutes. Consider amiodarone 150mg IV over 10 minutes for recurrent VF/VT with periods of ROSC where no antiarrhythmic yet given. **OR** b) Lidocaine: 1mg/kg IV/IO push (max = 100mg per push). Repeat at 1 mg/kg every 10 min up to a max of 3 mg/kg total. 6) Give Magnesium Sulfate 2 g IV/IO diluted in 10 mL NS or SW for Torsades de pointes. 7) Consider SGA. Do not interrupt CPR for airway insertion. Apply ETCO2.

*Joule settings:

- **Monophasic:** 360J
- **Physio-Control® Biphasic:** 200J (Increase to 300J, then 360J for each subsequent shock)
- **Zoll® Biphasic:** 120J (increase to 150J, then 200J for each subsequent shock)

- Consider Sodium Bicarbonate 1mEq/kg for known dialysis patient or suspected tricyclic OD.
- Defer intubation until after ROSC achieved to avoid interruption of CPR. BLS airway ok during resuscitation. SGA or Perilaryngeal Airway may be inserted during resuscitation if done without interruption of CPR.
- Consider Gastric Tube upon establishing an advanced airway
- Resuscitate on scene until return of spontaneous circulation (ROSC) or TOR criteria met. Contact Base for Determination of Death or transport if no ROSC and does not meet TOR criteria. *See Determination of Death Policy*
- If ROSC achieved, consider Therapeutic Hypothermia if inclusion criteria are met. *See Procedure*
- Consider push-dose epinephrine and/or epinephrine drip for hypotension.

HP-CPR:

- Push hard and fast 100-120/min)
- Press at least 2-2.5" deep while ensuring full chest recoil
- 1 cycle of CPR: 30:2, minimize interruptions
- Avoid hyperventilation
- Ventilate at 10 breaths per minute without compression pauses when an advanced airway is in place
- Rotate compressors every two minutes
- Check rhythm every 2 minutes

Consider possible correctable causes H's and T's:

Hypovolemia
Hypoxia
Hydrogen ion (acidosis)
Hypo-/hyperkalemia
Hypoglycemia
Hypothermia
Toxins
Tamponade, cardiac
Tension pneumothorax
Thrombosis (coronary or pulmonary)
Trauma

CONSIDER TERMINATION of RESUSCITATION

1. If EMS did not witness cardiac arrest and
2. No shockable rhythm and
3. No ROSC after 20 minutes of BLS and/or ALS resuscitation **AND** **NOT** hypothermic, victim of submersion, or obviously pregnant

PEDIATRIC

ASYSTOLE/PEA	PULSELESS VT/VF
1. Do 5 cycles of HP-CPR between each pulse check 2. Establish IV/IO. 3. Give Epinephrine IV/IO: 0.01 mg/kg (1:10,000: 0.1 mL/kg) q 3-5 min. 4. Consider SGA. Do not interrupt CPR for airway insertion. Assess ETCO2. 5. Consider Sodium Bicarbonate 1mEq/kg for known dialysis patient, arrest >20 minutes, suspected hyperkalemia or tricyclic OD.	1) Check rhythm. If indicated give 1 shock*, then immediately resume HP- CPR. Repeat shocks every 2 minutes as indicated for VF/VT. 2) Do 5 cycles of HP-**CPR** between each pulse check. 3) Establish IV/IO. 4) Give epinephrine IV/IO 0.01mg/kg (1:10,000: 0.1 mL/kg q 3-5 min. 5) Give antiarrhythmic: a) Amiodarone: 5 mg/kg mg Slow IV/IO push over 1-2 minutes– after the 3rd shock. May Repeat q 5 min twice for refractory VT/VF (for a total of 3 doses if required) **OR** b) Lidocaine: 1mg/kg IV/IO push (max = 100mg per push). Repeat 0.5 mg/kg every 5-10 minutes as needed up to a maximum of 3 mg/kg total. 6) Consider SGA. Do not interrupt CPR for airway insertion. 7) Apply ETCO2. Avoid Hyperventilation

Defibrillation *Joule settings:
1st dose: 2 J/kg
2nd and subsequent doses: 4 J/kg
Consider increasing joules not to exceed 10J/kg or adult dose for refractory VF.

Note: Adult pads may be used in lieu of pediatric pads if necessary. Attach pads anterior/posterior.

Consider Orogastric Tube upon establishing an airway.

During CPR:

- Push hard and fast 100 -120/min
- Press at least 1/3 depth of the chest while Ensuring full chest recoil (approx 1.5" – infants, 2" – peds)
- 1 cycle of CPR: 30:2 (1 rescuer) - 15:2 (2 rescuer)
- Ventilate at 10 breaths per minute without compression pauses when an advanced airway is in place – **avoid hyperventilation**
- Rotate compressors every two minutes
- Check rhythm every 2 minutes – minimize pauses

Consider possible correctable causes (H's and T's):

- **H**ypovolemia
- **H**ypoxia
- **H**ydrogen ion (acidosis)
- **H**ypo-/hyperkalemia
- **H**ypoglycemia
- **H**ypothermia
- **T**oxins
- **T**amponade, cardiac
- **T**ension pneumothorax
- **T**hrombosis (coronary or pulmonary)
- **T**rauma

CONSIDER TERMINATION of PEDIATRIC RESUSCITATION upon:

1. Completing 15 two-minute cycles of HP-CPR and
2. Minimum one dose of epinephrine and
3. No ROSC AND asystole on monitor and
4. Reversible causes identified/treated **AND**

Not hypothermic or victim of submersion.