CARDIAC ARREST - PEDIATRIC (Less than 15 years of age)

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.
- Compression rate shall be between of 100 - 120 per minute allowing full chest recoil at a depth of at least one-third (1/3) the anteroposterior diameter of the chest until the age of puberty.
- Avoid compressor fatigue by rotating compressors every two (2) minutes.
- Avoid hyperventilation as it can decrease survival.
- Ventilate at a rate of 12 - 20 per minute. Ventilation rate decreases as patient age increases. Volumes shall be the minimum necessary to cause chest rise.
- 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.

Whenever possible, provide family members with the option of being present during the resuscitation of an infant or a child. For any termination of efforts, base hospital contact is required.

I. FIELD ASSESSMENT/TREATMENT INDICATORS

Cardiac arrest in a non-traumatic setting. Consider the potential causes of arrest for age.

II. BLS INTERVENTIONS

- Assess patient, begin HP CPR, and maintain appropriate BLS airway measures.
- If available, utilize AED for patients one (1) year of age or older. To minimize the “hands off” interval before a rhythm analysis/shock, complete chest compressions cycle, without an added pause for ventilations or pulse check just before rhythm analysis.
- If shock is advised, perform HP CPR compressions while AED 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.

III. LIMITED ALS (LALS) INTERVENTIONS

- Perform activities identified in the BLS Interventions.
- Initiate HP CPR while applying the AED.
- Obtain IO/IV access (IO is preferred for under nine (9) years of age).
- For continued signs of inadequate tissue perfusion, administer fluid bolus of NS. Reassess after each bolus. May repeat two (2) times for continued signs of inadequate tissue perfusion.
  - 1 day to 8 years: 20 ml/kg NS
  - 9 to 14 years: 300 ml NS

IV. ALS INTERVENTIONS

- Initiate HP CPR and continue appropriate BLS Interventions while applying the cardiac monitor without interruption to chest compressions.
- Determine the cardiac rhythm and defibrillate at 2 j/kg (or manufacturer's recommended equivalent) if indicated. After defibrillation, immediately resume HP CPR. Begin a two (2) minute cycle of HP CPR.
- Obtain IO/IV access (IO is preferred).
- Utilize continuous quantitative waveform capnography, for monitoring of patient's airway, the effectiveness of chest compressions and for early identification of ROSC. Document the waveform and the capnography number in mm Hg in the ePCR.
- Continue with BLS airway management ensuring adequate ventilations. BLS airways should be maintained during active CPR.
- Endotracheal intubation is the advanced airway of choice if BLS airway does not provide adequate ventilation. Endotracheal intubation may only be performed on patients who are taller than maximum length of a pediatric emergency measuring tape (Broselow, etc.) or equivalent, measuring from the top of the head to the heel of the foot per ICEMA Reference #11020 - Procedure - Standard Orders.

  NOTE: Capnography **shall** be used for all cardiac arrest patients.
- Insert NG/OG tube per ICEMA Reference #11020 - Procedure - Standard Orders.

<u>Ventricular Fibrillation/Pulseless Ventricular Tachycardia</u>

- Initial defibrillation is administered at 2 j/kg (or manufacturer's recommended equivalent). Second defibrillation is administered at 4 j/kg. Third and subsequent defibrillation attempts should be administered at 10 j/kg not to exceed the adult dose.
- 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 10 seconds after each two (2) cycles of HP CPR. If VF/VT persists, defibrillate as indicated 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 HP CPR, consult base hospital.

Pulseless Electrical Activity/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 initial fluid bolus of 20 ml/kg NS for all ages, may repeat at:

  - 1 day to 8 years: 20 ml/kg NS

  - 9 to 14 years: 300 ml NS

- Administer Epinephrine, per ICEMA Reference #11010 - Medication - Standard Orders every five (5) minutes without interruption of HP CPR.

Stable ROSC

- Obtain a 12-lead ECG, upload and document then transport to the closest receiving hospital.

- Utilize continuous waveform capnography, to identify loss of circulation.

- Obtain blood glucose level. If indicated administer:

  - Dextrose per ICEMA Reference #11010 - Medication - Standard Orders.

  - May repeat blood glucose level. Repeat Dextrose per ICEMA Reference #11010 - Medication - Standard Orders if indicated.

- For suspected opiate overdose, administer Naloxone per ICEMA Reference #11010 - Medication - Standard Orders.

- For continued signs of shock and hypotension with SBP of less than 70 mm Hg **after** successful resuscitation administer Push Dose Epinephrine per ICEMA Reference #11010 - Medication - Standard Orders.

- Base hospital physician may order additional medications or interventions as indicated by patient condition.

V. REFERENCES

Number	Name
11010	Medication - Standard Orders
11020	Procedure - Standard Orders
13060	Drowning/Submersion Injuries