PO10 PEDIATRIC (AGE < 12 YEARS) CARDIAC ARREST-GENERAL PRINCIPLES

General Guideline:

A. Pediatric cardiac arrest more frequently represents progressive respiratory deterioration or shock rather than primary cardiac etiologies. Unrecognized deterioration may lead to bradycardia, agonal breathing, and ultimately asystole. Resulting hypoxic and ischemic insult to the brain and other vital organs make neurologic recovery extremely unlikely, even in the doubtful event that the child survives the arrest. Children who respond to rapid intervention with ventilation and oxygenation alone or to less than 5 minutes of advanced life support are much more likely to survive neurologically intact. Therefore, it is essential to recognize the child who is at risk for progressing to cardiopulmonary arrest and to provide aggressive intervention before asystole occurs

Specific Information Needed For Patient Care Report

A. Onset (witnessed or unwitnessed), preceding symptoms, bystander CPR, downtime before CPR and duration of CPR
B. Past History: medications, medical history, suspicion of ingestion, trauma, environmental factors (hypothermia, inhalation, asphyxiation)

Document Specific Objective Findings

A. Unconscious, unresponsive
B. Agonal, or absent respirations
C. Absent pulses
D. Any signs of trauma, blood loss
E. Skin temperature

General Treatment Guidelines

A. Treat according to Pediatric BLS and ALS pulseless arrest algorithms
B. Primary cardiac arrest from ventricular arrhythmia, while less common than in adults, does occur in children. If history suggests primary cardiac event (e.g.: sudden collapse during exercise), then rapid defibrillation is most effective treatment
C. Most pediatric pulseless arrest is the result of primary asphyxia event, therefore initial sequence is chest compressions **with** ventilations, unlike adult pulseless arrest
D. Call for ALS assistance if not already on scene or responding

General Guidelines: Chest Compressions for 2 Rescuers

Once advanced airway in place, chest compressions should be given continually with ventilations at 10/minute

Neonate (≤ 1 month old)

- 1 cycle of CPR = 3:1 chest compressions: breaths.

Infant and Child (1 month to 12 years old)

A. 1 cycle of CPR = 15:2 chest compressions:
breaths

- Push hard and fast at a compression rate of 100/minute
- Minimize interruption to chest compressions
    a. Continue CPR while defibrillator is charging, and resume CPR immediately after all shocks. Do not check pulses except at end of CPR cycle and if rhythm is organized at rhythm check
    b. Increase in compression interruption correlates with decrease in likelihood of successful defibrillation
- Ensure full chest recoil

a. Represents diastolic phase for cardiac filling due to negative intrathoracic pressure

- Avoid hyperventilation
  a. Associated with barotrauma and air trapping
  b. Makes CPR less effective by inhibiting cardiac output by increasing intrathoracic pressure and decreasing venous return to the heart
- Rotate compressors every 2 minutes during rhythm checks

General Guidelines: Defibrillation

A. First shock delivered at 2 J/kg biphasic
B. All subsequent shocks delivered at 4 J/kg biphasic

General Guidelines: Ventilation during CPR

A. Do not interrupt chest compressions and do not hyperventilate
B. Contrary to adult cardiac arrest, pediatric arrest is much more likely to be asphyxia and prolonged. During this period, blood continues to flow to the tissues causing oxygen saturation to decrease and carbon dioxide to increase. Pediatric patients need both prompt ventilation and chest compressions.
C. Hyperventilation decreases effectiveness of CPR and worsens outcome

General Guidelines: Timing Of Placement Of Advanced Airway

A. ***BVM is preferred method of ventilation in all pediatric patients age < 8 years***
B. A supraglottic airway (e.g. King) may be placed at any point in resuscitation in patients ≥ 8 years old and may be considered equivalent to, but not superior to, BVM for ages 8-12
C. Do not hyperventilate
D. Always confirm advanced airway placement by objective criteria: $ETCO_2$
   a. Use continuous waveform capnography if available

General Guidelines: Pacing

A. Effectiveness of transcutaneous pediatric pacing has not been established and is not recommended

General Guidelines: ICD/Pacemaker patients

A. If cardiac arrest patient has an implantable cardioverter defibrillator (ICD) or pacemaker: place pacer/defib pads at least 1 inch from device. Biaxillary pad placement may be used

Special Notes:

A. Consider reversible causes of cardiac arrest (“Hs and Ts”):

Hypovolemia	IV Fluid bolus
Hypoxia	Ventilation
Hydrogen Ion (acidosis)	Ventilation
Hyperkalemia	Sodium bicarbonate
Hypothermia	See hypothermia protocol
Toxins: e.g.: opioid overdose	Naloxone 2mg IVP
Tamponade (cardiac)	
Tension pneumothorax	Needle thoracostomy
Thrombosis (coronary)	
Trauma	