Pediatric Cardiac Arrest – General

This protocol should be followed for all pediatric cardiac arrests.

- If an arrest is of a known traumatic origin refer to the **Dead on Scene Protocol**.
- If it is unknown whether the arrest is traumatic or medical, continue with this protocol.
- When an ALS unit is present, follow this general cardiac arrest protocol in conjunction with the protocol that addresses the indentified rhythm.
- Once arrest is confirmed, emphasis should be on avoiding interruptions in CPR.
- CPR should be done in accordance with current guidelines established by the American Heart Association.

Note: Primary cardiac arrest in the pediatric patient is rare. Most arrests are secondary to respiratory failure. Consider maintaining basic airway management techniques if effective. Advanced airway insertion attempts should be performed in such a manner as to keep CPR interruptions to a minimum. Medications given during arrest are best given IV or IO. Avoid endotracheal administration unless IV or IO access is unavailable.

Pre-Medical Control

MFR/EMT/SPECIALIST

1. Confirm Arrest
   A. Assess for signs of normal breathing.
   B. Check a carotid or brachial pulse as age appropriate for not more than 10 seconds.
2. Initiate CPR or continue CPR if already in progress and apply and use AED as soon as available.
3. Ensure CPR quality
   A. Compressions at least 1.5” in depth for infants, 2” in depth for children.
   B. Compression rate at least 100 per minute.
   C. Avoid excessive ventilation (volume and rate).
4. Continue CPR with minimal interruptions, changing the rescuer doing compressions every 2 minutes, when possible.
5. Initiate ALS response if available.
6. Establish a patent airway, maintaining C-Spine precautions if indicated, using appropriate airway adjuncts and high flow oxygen. Ventilations with BVM may be as effective as endotracheal intubation in children. Any patient 8 years and under shall be ventilated via BVM or other basic maneuver.

EMT

7. If Return of Spontaneous Circulation (ROSC) has **not** been achieved after three, two minute cycles of CPR and ALS is not available or delayed, contact medical control, initiate transport.
8. If unable to ventilate or unable to maintain a patent airway, establish an airway with a supraglottic airway when indicated. After insertion provide continuous

CPR, without pauses for ventilation. Ventilations delivered at 8-10 breaths per minute or 1 breath every 6 to 7 seconds. See **Emergency Airway Procedure.**

9. Verify CPR quality frequently and anytime rescuer providing compressions or ventilations change.

SPECIALIST

10. If Return of Spontaneous Circulation (ROSC) has **not** been achieved after three, two minute cycles of CPR and ALS is not available or delayed, contact medical control, initiate transport.
11. Start an IV/IO NS KVO. If IV is unsuccessful after 2 attempts start an IO line per **Vascular Access & IV Fluid Therapy Procedure.** IO may be first line choice.
12. If unable to ventilate or unable to maintain a patent airway, establish an airway, maintaining C-Spine precaution if indicated, using appropriate airway adjuncts and high flow oxygen. See **Emergency Airway Procedure.**
    A. Minimize interruptions in compressions during airway placement to less than 10 seconds.

PARAMEDIC

13. Confirm Arrest if not previously done.
    A. Assess for signs of normal breathing.
    B. Check a carotid or brachial pulse as age appropriate for not more than 10 seconds.
14. Initiate CPR, or continue CPR if already in progress and apply cardiac monitor.
15. Check rhythm, shock if indicated and continue CPR.
16. Ensure CPR quality
    A. Compressions depress at least one third the anterior-posterior diameter of the chest or approximately 1.5” in infants and 2” in children.
    B. Compression rate at least 100 per minute.
    C. Avoid excessive ventilation (volume and rate).
    D. Apply waveform capnography, if available.
17. Start an IV/IO NS KVO. If IV is attempted and is unsuccessful after 2 attempts start an IO line per **Vascular Access & IV Fluid Therapy Procedure.** IO may be first line choice.
18. Administer Medications consistent with appropriate protocol.
19. If unable to ventilate or unable to maintain a patent airway, establish an airway, maintaining C-Spine precaution if indicated, using appropriate airway adjuncts and high flow oxygen. See **Emergency Airway Procedure.**
    A. Minimize interruptions in compressions during airway placement to less than 10 seconds.
    B. Supraglottic airways are an acceptable alternative for endotracheal intubation.
20. If quantitative waveform capnography is available and P_{ETCO_2} is < 10 mm Hg attempt to improve CPR quality.

21. Reassess ABC's as indicated by rhythm or patient condition change. Pulse checks should take no more than 10 seconds. If no pulse after 10 seconds, assume pulselessness, continue CPR.
22. After insertion of advanced airway, monitor capnography to confirm appropriate tube placement and deliver continuous CPR, without pauses for ventilation. Ventilations delivered at 8-10 breaths per minute or 1 breath every 6 - 7 seconds.

Post-Medical Control
MFR/EMT/SPECIALIST/PARAMEDIC

23. Additional basic and/or advanced life support care as appropriate.
24. Consider termination of resuscitation per **Termination of Resuscitation Protocol.**

Notes:

1. **Excellent CPR is a priority:**
   A. 15 compressions: 2 ventilations in groups of 10 cycles, over 2 minutes.
   B. Push hard depress at least one third the anterior-posterior diameter of the chest or approximately 1.5" in infants and 2" in children and fast (≥100/min) and allow full recoil of chest during compressions.
   C. Change rescuer doing compressions every 2 minutes to avoid fatigue or utilize automated mechanical CPR devices, if available.
   D. Restart CPR immediately after any defibrillation attempts.
   E. Keep pauses in CPR to a minimum by checking rhythm when rotating rescuer doing compressions and by avoiding pauses in CPR during airway management and other interventions.
2. Brachial pulse check is used for infants. Carotid pulse check is used for ages 1 – 8 years.
3. If AED has been applied by BLS personnel, skip to appropriate place in protocol that incorporates previous care. ALS personnel should switch to manual defibrillator after initial AED shock or place AED in manual mode.
4. First shock 2 J/kg, second shock 4 J/kg, subsequent shocks greater than or equal to 4 J/kg, maximum 10 J/kg or adult dose.
5. Confirm and document tube placement by physical exam, measurement of exhaled CO_2 and/or use of other MCA approved secondary confirmation device.
6. If possible, contact medical control prior to moving or transporting patient.
7. Continue resuscitation attempts and initiate transport, unless field termination is ordered by Medical Control.
8. An impedance threshold device may be utilized during CPR, if available. Device should be discontinued immediately upon return of spontaneous circulation.
9. Ventilation with BVM may be as effective as endotracheal intubation in children. Any patient 8 years and under shall be ventilated via BVM or other basic maneuver. If unable to ventilate, or unable to maintain patent airway, then intubation shall be attempted. Refer to Broselow Pediatric Emergency Care tape or similar tape for proper pediatric airway equipment guidelines.
10. Treat reversible causes.

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Confirm Arrest if not previously done.

- Assess for normal breathing.
- Check a carotid or brachial pulse as appropriate for age for not more than 10 seconds.
- Initiate CPR or Continue CPR if already in progress.
- Apply cardiac monitor.
- Check rhythm, shock if indicated and continue CPR.

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Ensure CPR quality

- Compressions depress at least one third the anterior-posterior diameter of the chest or approximately 1.5" in infants and 2" in children.
- Compression rate at least 100 per minute.
- Avoid excessive ventilation (volume & rate).
- Apply waveform capnography, if available.

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- Start an IV/IO NS KVO
- If IV is attempted and is unsuccessful after 2 attempts start an IO line per **Vascular Access & IV Fluid Therapy Procedure.** IO may be first line of choice.
- Administer medications consistent with appropriate protocol

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If unable to ventilate or unable to maintain a patent airway, establish an airway, maintaining C-Spine precaution if indicated, using appropriate airway adjuncts & high flow oxygen. See **Emergency Airway Procedure.**

- Minimize interruptions in compressions during airway placement to less than 10 seconds.
- Supraglottic airways are an acceptable alternative for endotracheal intubation.
- If quantitative Waveform Capnography is available and $PETCO_2$ is < 10 mm Hg, attempt to improve CPR quality.

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Contact Medical Control

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- Additional basic and/or advanced life support care as appropriate.
- Consider termination of resuscitation per **Termination of Resuscitation Protocol.**

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