

Patient Safety Considerations

- AEDs can be used on pediatric patients with preference given, in order, to the following devices:
 - AED with pediatric dose attenuator
 - Or**
AED with pediatric pad
 - Or**
AED with pediatric key/switch
- AED with adult pad

Infection Prevention and Control Considerations

- Providers directly involved in patient care must be wearing appropriate PPE
- N95 respirator is mandatory with airway management, including BVM ventilation and any Aerosol Generating Medical Procedure (AGMP)

Consider the following:

- Goals of Care Designation

***CPR GUIDELINES**

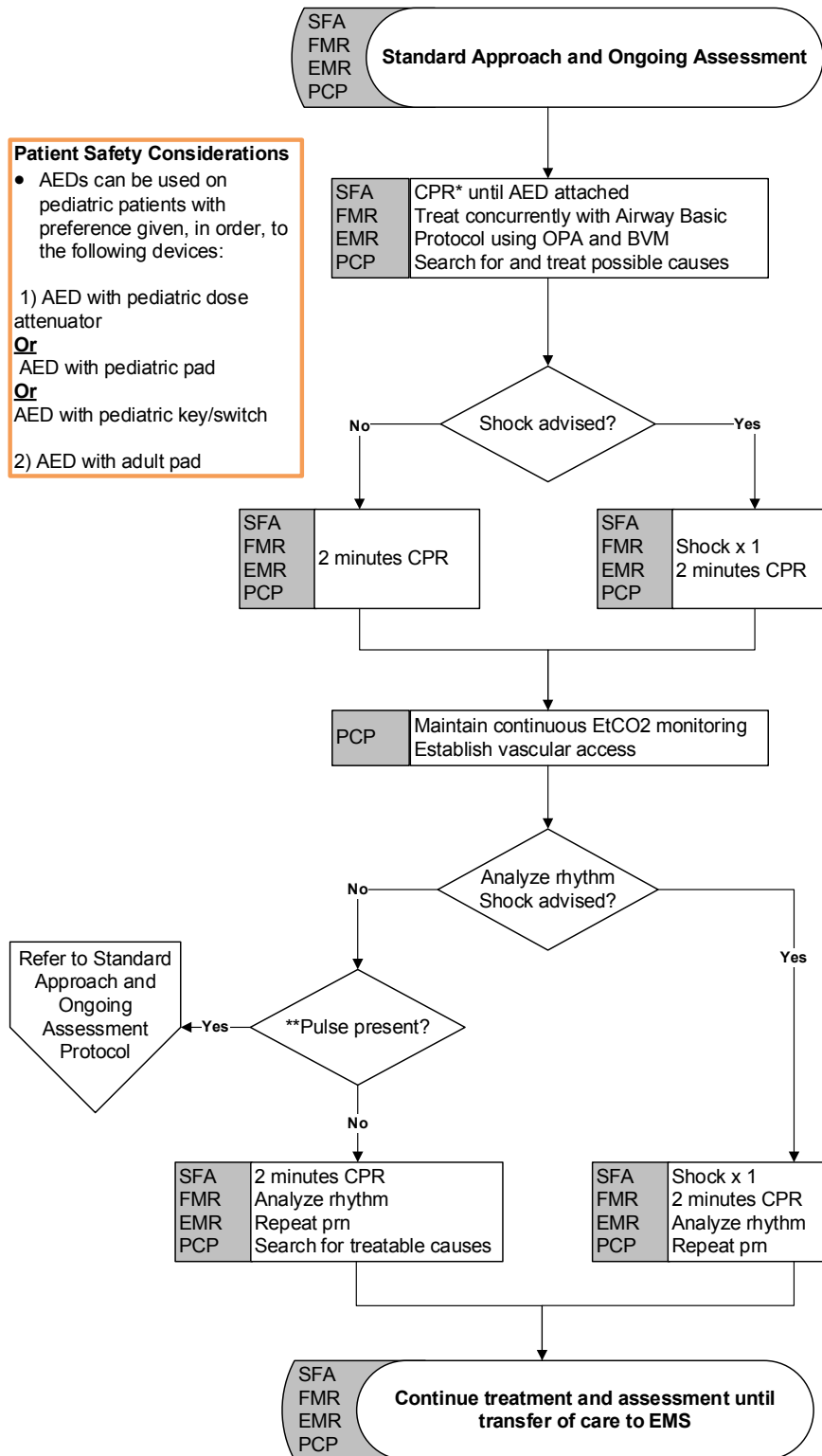
- CPR chest compressions should not be interrupted for greater than 10 seconds
- During CPR, push hard and fast (100-120/min)
- Ensure full chest recoil
- Continue CPR while AED charges
- If EtCO₂ reading consistently less than 10-15 mmHg focus efforts on improving CPR

****Pulse Present**

- Patients less than one year old with a pulse of less than 60 BPM and signs of poor perfusion (e.g. cyanosis) require CPR

Differential Diagnosis
Search for and treat possible contributing factors

- Hypovolemia
- Hypoxia
- Hydrogen ion (acidosis)
- Hypo / Hyperkalemia
- Hypothermia
- Tablets / Toxins
- Tamponade – cardiac
- Tension pneumothorax
- Thrombosis – coronary
- Thrombosis – pulmonary



Etiology

Cardio Pulmonary Resuscitation (CPR)

CPR and defibrillation are the only treatment modalities that have been proven to positively correlate with survival at the time of hospital discharge. The importance of high quality CPR and early intervention cannot be overstated. Witnessed cardiac arrest with bystander CPR is positively correlated with survival to hospital discharge. As such, EMS and MFR should perform full resuscitation in settings where first responder / bystander CPR has been initiated unless obvious signs of death are present (see Pediatric Withholding / Discontinuing Resuscitation Protocol). The periods immediately before and after defibrillation are the most critical times to perform CPR.

Pediatric Considerations

In pediatric cardiac arrest situations, priority should be given to oxygenation, airway control, and transport. The primary cause of a pediatric cardiac arrest is rarely cardiac in origin. Cardiac arrest in children usually results from profound and prolonged hypoxemia (e.g. respiratory distress leading to failure, or shock). As a result, strict attention to ensuring adequate oxygenation is critical. In an unwitnessed pediatric cardiac arrest, treat the arrest as asphyxia in origin.

Interventions

CPR

1. Perform CPR at a ratio of 15 compressions to 2 ventilations at a rate of 100 – 120 compressions / minute
2. Keep breaks to a minimum (less than 10 seconds) so that perfusion pressure is maintained; high quality CPR with minimal interruptions increases the likelihood of patient survival
3. Maintain a compression depth of at least one third the anterior-posterior diameter of the chest
4. Ensure full chest recoil
5. Fatigue significantly impacts the quality of CPR; relieve the rescuer every 2 minutes to maintain the quality of compressions
6. If an advanced airway has been placed, perform continuous compressions without pauses for ventilations
7. Administer 15LPM high flow oxygen to patients requiring CPR

Patient Safety Considerations

AEDs can be used on patients less than 1 year of age with preference given, in order, to the following devices:

- 1) Manual defibrillator
- 2) AED with pediatric dose attenuator
- 3) AED with adult or pediatric pads

AED

1. Perform CPR until AED is attached
2. As soon as energy is delivered, resume CPR
3. Follow the prompts of the AED

Airway Management

Most pediatric airways can be effectively managed with proper positioning and an OPA/NPA and BVM and will not require further airway interventions. **The gold standard for airway management is the patient maintaining their own airway, not advanced airway placement.** Both the International Liaison Committee on Resuscitation (ILCOR) and American Heart Association (AHA) recommend BVM as the preferred technique for airway management in pediatric resuscitation.

Hyperventilation and hyperinflation is detrimental to patient outcomes; maintain ventilation rates at 8 – 10 / minute during resuscitation and ensure visible chest rise without excessive volume or ventilation rates

Vascular Access

1. Antecubital or external jugular veins are the veins of choice for establishing IV access in cardiac arrest situations, as they provide a more rapid access to the central circulation
2. IO is an acceptable vascular access route in the pediatric arrest and should be considered early in the resuscitation if an IV is not readily attainable.

End Tidal CO₂ Monitoring (EtCO₂)

1. Routine confirmation of advanced airway placement with EtCO₂ monitoring is required. It is the presence of a waveform, not the absolute value, which confirms supraglottic airway placement
2. Continuous EtCO₂ monitoring provides valuable information on supraglottic airway placement, effectiveness of ventilation, quality of CPR and ROSC
 - a. A flat EtCO₂ tracing likely indicates a misplaced or esophageal supraglottic airway
 - b. Waveform and numerical value can be used to monitor hyper and hypoventilation
 - c. If EtCO₂ is consistently below 10-15 mmHg focus efforts on improving the quality of CPR and avoiding excessive ventilation
 - d. An abrupt and sustained increase in EtCO₂ values (typically greater than 40 mmHg from previous readings) can be a reliable indicator of ROSC. Use caution when interpreting EtCO₂ shortly after administration of sodium bicarbonate IV as it may produce a false positive elevation in the EtCO₂ reading