

**Consider the following:**

- Goals of Care Designation

SFA  
 FMR  
 EMR  
 PCP  
**Standard Approach and Ongoing Assessment**

SFA FMR EMR PCP	CPR* until AED attached Treat concurrently with Airway Basic Protocol using OPA and BVM Search for and treat possible causes
EMR PCP	Consider NPA

Shock advised?

SFA  
 FMR  
 EMR  
 PCP  
 2 minutes CPR

SFA  
 FMR  
 EMR  
 PCP  
 Shock x 1  
 2 minutes CPR

PCP  
 Maintain continuous EtCO2 monitoring  
 Establish vascular access

Analyze rhythm  
Shock advised?

Refer to Standard Approach and Ongoing Assessment Protocol

Pulse present?

SFA  
 FMR  
 EMR  
 PCP  
 2 minutes CPR  
 Analyze rhythm  
 Repeat pm  
 Search for treatable causes

SFA  
 FMR  
 EMR  
 PCP  
 Shock x 1  
 2 minutes CPR  
 Analyze rhythm  
 Repeat pm

SFA  
 FMR  
 EMR  
 PCP  
**Continue treatment and assessment until transfer of care to EMS**

**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)

**\*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

**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 Adult Withholding / Discontinuing Resuscitation Protocol). The periods immediately before and after defibrillation are the most critical times to perform CPR.

The CPR skills described in this document are targeted towards the Health Care Provider (HCP) with Basic Life Support (BLS).

Adults – Patients that have signs of puberty and older. Signs of puberty include breast development in females; and underarm, chest, and facial hair in males. Typically 8 years of age and older.

## Interventions

### CPR

1. Scene Survey
2. Confirm unresponsiveness
3. Assess for breathing – Take at least 5 seconds and no more than 10 seconds
4. Check pulse – Take at least 5 seconds and no more than 10 seconds to find the pulse
5. Start CPR
6. Perform CPR with a ratio of 30 compressions to 2 ventilations at a rate of 100 - 120 compressions / minute
7. Depth – At least 5 to 6 cm or 2 inches of chest depth. Push hard, deep, and fast; and release completely. Allow the chest to recoil completely. Minimize interruptions
8. 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
9. Maintain a compression depth of 5 - 6 cm
10. Ensure full chest recoil
11. Fatigue significantly impacts the quality of CPR; relieve the rescuer every 2 minutes to maintain the quality of compressions
12. If a supraglottic airway adjunct has been placed, perform continuous compressions without pauses for ventilations
13. Administer 15LPM high flow oxygen to patients requiring CPR
14. Mechanical CPR devices may be used after manual CPR and initial defibrillation has occurred, providing staff are adequately trained and equipped in their use

## Medical First Response

15. If high quality CPR is already being performed by someone on-scene, crews do not need to perform the initial 2 minute CPR cycle and can use the AED immediately
16. If there is limited personnel is available to perform CPR consider using a nasal cannula at 15LPM

## Notes:

A witnessed arrest is one that is actually witnessed by crews.

\*In the unlikely event there is a pulse but no breathing, provide BVM or mouth to mask/shield ventilations 1 breath every 5 to 6 seconds.

## AED

1. Perform CPR while the AED charges to minimize interruptions
2. Manual defibrillation is the preferred method of shock delivery for ACPs. An AED should only be used if no manual defibrillator is available
3. As soon as energy is delivered, resume CPR for 2 minutes prior to reassessing rhythm

## Airway Management

1. Restricted to clearing the airway and using an OPA/NPA and BVM in the early stages (e.g. initial 2 minutes) of resuscitation
2. Better patient outcomes have been observed with the use of an OPA/NPA and BVM compared to advanced airway placement
3. Provide ventilations – use a BVM, one way valve mask or shield to provide ventilations between cycles of compressions.
4. Hyperventilation in the setting of cardiac arrest 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

Check for DNR or Goals of Care designation

End Tidal CO<sub>2</sub> Monitoring (EtCO<sub>2</sub>)

1. Continuous EtCO<sub>2</sub> monitoring provides valuable information on advanced airway placement, effectiveness of ventilation (BVM, King LT, LMA), quality of CPR and ROSC
  - a. A flat EtCO<sub>2</sub> tracing likely indicates a misplaced or esophageal endotracheal tube
  - b. Waveform and numerical value can be used to monitor hyper and hypoventilation
  - c. If EtCO<sub>2</sub> 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 EtCO<sub>2</sub> values (typically greater than 40 mmHg from previous readings) can be a reliable indicator of ROSC. Use caution when interpreting EtCO<sub>2</sub> shortly after administration of sodium bicarbonate IV as it may produce a false positive elevation in the EtCO<sub>2</sub> reading
  - e. A low EtCO<sub>2</sub> reading (less than 10 mmHg) after 20 minutes of high quality CPR is associated with a very low likelihood of resuscitation. If present, consider

discontinuing resuscitation efforts in accordance with the Adult Withholding /  
Discontinuing Resuscitation MCP

Search for and treat possible contributing factors

CAUSE	TREATMENT
Hypovolemia	Oxygenation / Rapid transport / Volume infusion
Hypoxia	Oxygenation
Hydrogen ion (acidosis)	Oxygenation / sodium bicarbonate
Hypokalemia	Rapid transport
Hyperkalemia	calcium chloride / sodium bicarbonate
Hypothermia	Adult Hypothermic Cardiac Arrest Protocol
Tablets / Toxins	Refer to appropriate Adult Protocol
Tamponade – cardiac	Oxygenation / Rapid transport / Volume infusion
Tension pneumothorax	Pleural decompression / Adult Pneumothorax Protocol
Thrombosis – coronary	Oxygenation / Rapid transport
Thrombosis – pulmonary	Oxygenation / Rapid transport