# 7G HIGH PERFORMANCE CPR

## PATIENT CARE GOALS

- Provide resuscitation of the cardiac arrest victim using techniques proven to improve not only survival but survival with good neurological outcome.

## ALL PROVIDERS

The following represent the general principles that guide the delivery of High Performance CPR

1. Designate early and verbally acknowledge the patient care provider who will function as the Team Leader (incident commander).
2. Utilize Pit Crew CPR (see below) to assure that each rescuer performs only those tasks they are responsible for.
3. Adhere initially to the four (4) Phase approach to arrest management (see below).
4. Basic Life Support and CPR Performance
    - Monitor and assure quality CPR for rate, depth, and chest recoil
    - Switch compressors every two (2) minutes or five (5) cycles to avoid fatigue and reduced compression quality
    - Before and after advanced airway placement, compression to ventilation ratio for adults is asynchronous (no pause in chest compression for delivery of breaths) at a rate of one (1) breath every six (6) seconds. The ratio for children who have not reached puberty is 30:2 prior to advanced airway placement with a single rescuer and 15:2 for 2 or more rescuers. Once an advanced airway is placed the ratio becomes asynchronous at a rate of 1 breath every 6 seconds
    - Utilize the ResQPump or LP15 metronome to assist in achieving the correct compression rate. For CPR with the ResQSystem deployed, a rate of eighty (80) active compression/decompressions is ideal. Traditional CPR should achieve a rate of at least 100 (but no faster than 120) per minute
    - For patients with a shockable rhythm, at 1:45 seconds 'Pre-Charge' the LP15 to deliver the shock immediately after rhythm identification
    - Chest compressions are only interrupted during rhythm analysis, delivering shocks, or when CPR cannot be performed when moving the patient. Attempt to minimize interruptions to less than ten (10) seconds
    - If during the analysis pause a shockable rhythm is detected resume compressions while the AED or defibrillator is charging
    - Continue chest compressions during attempts to place an advanced airway
    - Resume compressions immediately after administering shocks
5. Ventilation and Advanced Airway
    - Insert an NPA in each nostril and an OPA
    - BVM ventilations must be performed using two (2) rescuers. Rescuer 1, using two (2) hands Thumb down technique in order to maintain a face-mask seal, while the second rescuer ventilates. ResQPod will be utilized for all pulseless patients

- Obtain capnography prior to advanced airway placement by attaching the capnography sensor distal to the ResQPod
- Insert a supraglottic airway or perform endotracheal intubation after a minimum of two (2) rounds of CPR, IV/IO access is secured, and cardiac medications administered as appropriate. Intubation should not be performed by the Team Leader but instead by other ALS providers if available
- Persistently low ETCO2 less than ten (10) mmHg during quality CPR and where the airway device is confirmed to be patent suggests that a return of spontaneous circulation is unlikely. Consider that the low ETCO2 may be a result of:
  - — A long arrest period or "down-time"
  - — Acute massive pulmonary embolism
  - — Cardiac tamponade
  - — Exsanguination

6. Automatic Mechanical CPR Device (Lucas™)
   - ResQSYSTEM IN PROGRESS: Do not apply or use Lucas™ until the first five (5) rounds of CPR are complete, IV/IO access is secured, cardiac medications administered as appropriate, and an advanced airway is placed and confirmed (approximately 10-15 minutes)
   - MANUAL CPR IN PROGRESS: Do not apply or use Lucas™ until the first three (3) rounds of manual compressions are complete
   - LUCAS™ RUNNING ON ARRIVAL: If in use prior to arrival, evaluate if the device is performing acceptable chest compressions and discontinue use if needed to improve CPR quality

## Pit Crew CPR

**Rescuer Positions and their Roles (see charts at end of procedure)**

**Rescuer 1 (BLS) at Position 1**

- Immediately responds to patient's side and begins chest compressions
- Performs the initial 200 or two (2) minutes of compressions
- Alternates chest compressions with Rescuer 2 every two (2) minutes or 200 compressions
- When rescuer 3 (BLS or ALS) arrives and when alternated out of performing chest compressions with Rescuer 2, will squeeze BVM bag in timing with the ResQPod light (if the patient is a child without an advanced airway placed then the compression/ventilation ratio is 15:2 without the ResQPod light in use.)

**Rescuer 2 (BLS) at Position 2 (Team Leader until ALS arrives)**

- Establishes the CPR Triangle
- Attaches AED or HEMT monitor/defibrillator to patient
- Performs two (2) minutes of compressions after the first analyze/shock
- Alternates chest compressions with Rescuer 1 every two (2) minutes
- When rescuer 3 (BLS or ALS) arrives and when alternated out of performing chest compressions with Rescuer 2, will squeeze BVM bag in timing with the ResQPod light (if the patient is a child without an advanced airway placed then the compression/ventilation ratio is 15:2 without the ResQPod light in use.)

**Rescuer 3 (BLS or ALS) at Position 3**

- Inserts two (2) NPA's and one OPA
- Attaches ResQPod directly to facemask
- Attaches the capnography sensor distally to the ResQPod
- Connects the BVM bag to the capnography sensor
- Maintains a tight face-mask seal using two hands (thumbs down technique)
- Prepares and inserts the supraglottic airway or endotracheal tube at the specified time
- Ensures that both Rescuer 1 and 2 are performing high quality compressions
- Applies AED pads and operates AED as instructed by the device

**Rescuer 4 (ALS Team Leader) at Position 4**

- Attempts to stay outside the CPR Triangle
- Switch out AED pads with monitor/defibrillator pads
- Assure that monitor is within arm's reach and screen is viewable at all times
- Assess rhythm at two (2) minute intervals and prints six (6) second ECG strip
- Calls "clear" and performs defibrillation when appropriate
- Vascular Access (IO/IV)
- Administer appropriate medications (ALS)

**Rescuer 5 (BLS/ALS) at Position 5**

- Obtains vascular access
- Administer appropriate medications (ALS only)
- Prepares Lucas™, applies back plate, and connects clips with the help of rescuer 1 and 2 during rhythm analysis
- Available as backup chest compressor
- Completes code Checklist

## 4 Phase Approach to Arrest Management

**Phase 1: Patient's side to first shock**

1. Confirm pulselessness and announce to all present "Cardiac Arrest"
2. Start CPR – continuous chest compressions at the appropriate rate, depth, and recoil
3. Power on the AED or cardiac monitor/defibrillator
4. Extend the cables and coordinate the application of the pads with the rescuer on chest compressions
5. At the conclusion of the first cycle of compressions analyze the rhythm.
6. If shockable, resume CPR, and charge the defibrillator
7. Once the defibrillator is charged, announce "Stop CPR"

8. The person on chest compressions should “hover” to indicate they are clear
9. Push the shock button
10. Resume immediate compressions

**Phase 2: First two (2)-minute cycle after the first shock**

1. Rotate chest compressors every two (2) minutes
2. Deploy and test the suction unit
3. Assemble the BVM
4. Attach ResQPod directly to BVM
5. Attach capnography between ResQPod and monitor/defibrillator
6. Attach BVM to oxygen
7. Insert an OPA and two (2) NPAs

**Phase 3: Compressor Switch, Vascular Access and Medications**

1. Rotate chest compressors every two (2) minutes
2. Analyze rhythm and defibrillate as appropriate every two (2) minutes
3. Establish IV/IO access
4. Administer medications as appropriate
5. Prepare and place advanced airway
6. Transition to Lucas™ at appropriate time

**Phase 4: Post-resuscitation care**

Follow guideline **2F: Post-Resuscitation Care**

## Checklist

The following checklists should be used during and after resuscitation to improve the quality of CPR and arrest management.

**Resuscitation Checklist (include time of each step)**

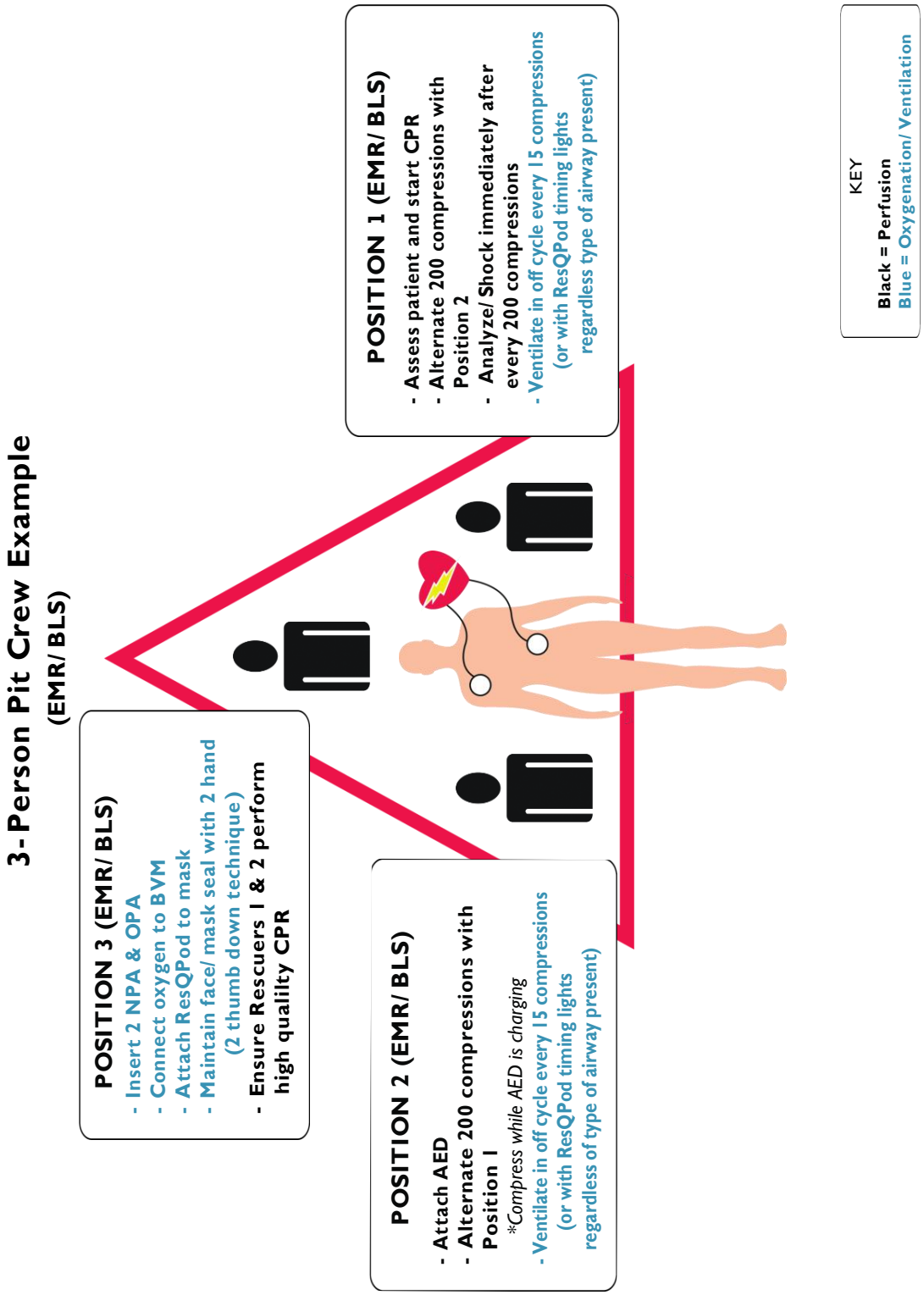
- ☐ _____ Dispatch notified of working arrest
- ☐ _____ CPR Triangle Established
- ☐ _____ Team Leader Designated
- ☐ _____ Continuous compressions with minimal interruptions (< 10 secs)
- ☐ _____ CPR metronome in use
- ☐ _____ Monitor is visible to Team Leader
- ☐ _____ 2 NPAs and 1 OPA inserted
- ☐ _____ BVM performed using 2 hand 2 rescuer technique
- ☐ _____ ResQPod attached to mask and advanced airway (after insertion)
- ☐ _____ Capnography sensor attached to ResQPod
- ☐ _____ Supraglottic airway (or Intubation) performed
- ☐ _____ IV/IO access established
- ☐ _____ LUCAS applied
- ☐ _____ ROSC attained
- ☐ _____ Attempts Terminated

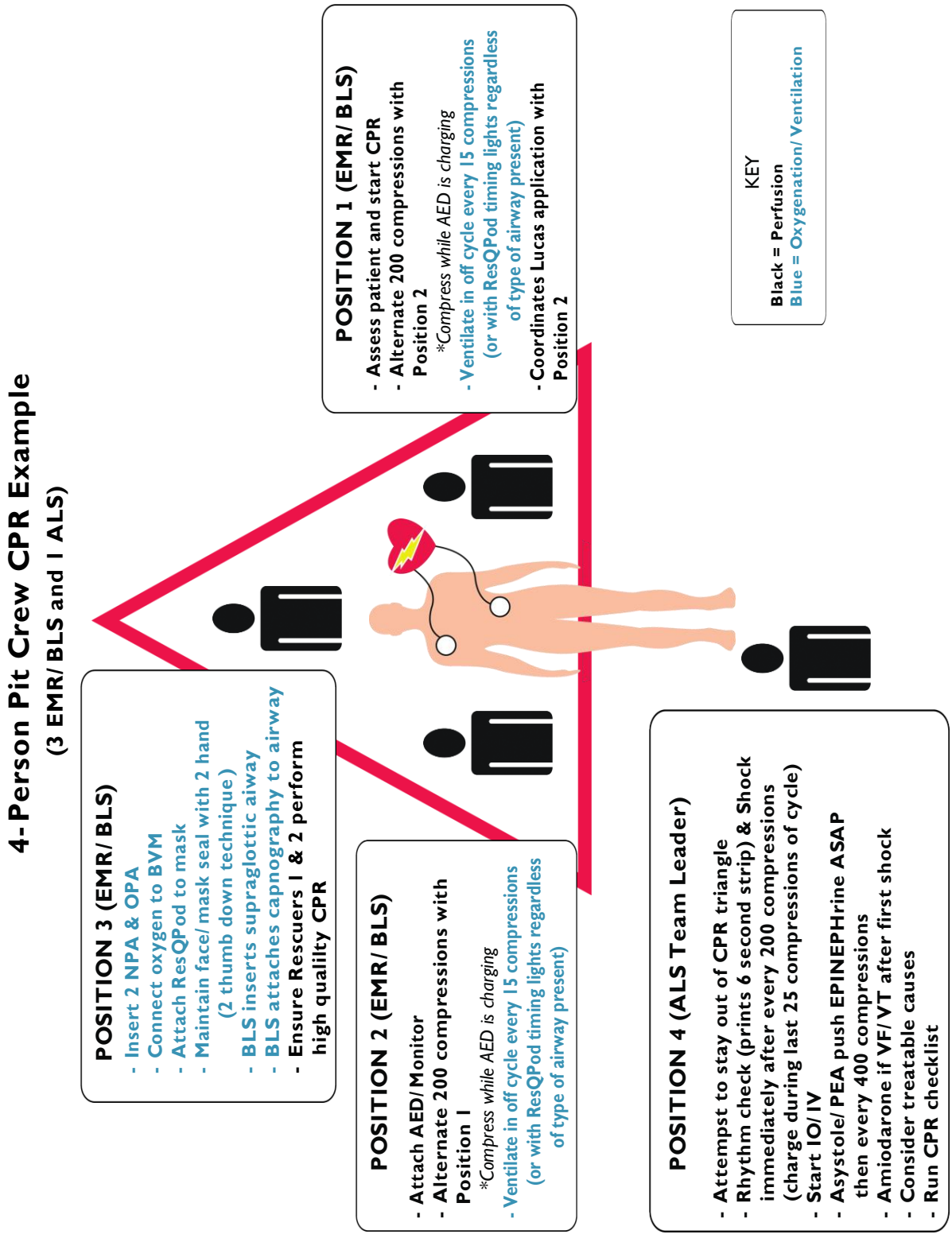
**DOCUMENTATION KEY POINTS**

- Identity of Rescuers and position they are assigned to
- Challenges in establishing or maintaining the CPR Triangle

**NOTES**

See Pit Crew CPR Charts on following pages


3-Person Pit Crew Example
(EMR/ BLS)
POSITION 3 (EMR/ BLS)
- Insert 2 NPA & OPA
- Connect oxygen to BVM
- Attach ResQPod to mask
- Maintain face/ mask seal with 2 hand (2 thumb down technique)
- Ensure Rescuers 1 & 2 perform high quality CPR
POSITION 2 (EMR/ BLS)
- Attach AED
- Alternate 200 compressions with Position 1
*Compress while AED is charging
- Ventilate in off cycle every 15 compressions (or with ResQPod timing lights regardless of type of airway present)
POSITION 1 (EMR/ BLS)
- Assess patient and start CPR
- Alternate 200 compressions with Position 2
- Analyze/ Shock immediately after every 200 compressions
- Ventilate in off cycle every 15 compressions (or with ResQPod timing lights regardless type of airway present)
KEY
Black = Perfusion
Blue = Oxygenation/ Ventilation


4-Person Pit Crew CPR Example
(3 EMR/BLS and 1 ALS)
POSITION 3 (EMR/BLS)
- Insert 2 NPA & OPA
- Connect oxygen to BVM
- Attach ResQPod to mask
- Maintain face/mask seal with 2 hand (2 thumb down technique)
- BLS inserts supraglottic aiway
- BLS attaches capnography to airway
- Ensure Rescuers 1 & 2 perform high quality CPR
POSITION 1 (EMR/BLS)
- Assess patient and start CPR
- Alternate 200 compressions with Position 2
*Compress while AED is charging
- Ventilate in off cycle every 15 compressions (or with ResQPod timing lights regardless of type of airway present)
- Coordinates Lucas application with Position 2
POSITION 2 (EMR/BLS)
- Attach AED/Monitor
- Alternate 200 compressions with Position 1
*Compress while AED is charging
- Ventilate in off cycle every 15 compressions (or with ResQPod timing lights regardless of type of airway present)
POSITION 4 (ALS Team Leader)
- Attempst to stay out of CPR triangle
- Rhythm check (prints 6 second strip) & Shock immediately after every 200 compressions (charge during last 25 compressions of cycle)
- Start IO/IV
- Asystole/PEA push EPINEPHrine ASAP then every 400 compressions
- Amiodarone if VF/VT after first shock
- Consider treatable causes
- Run CPR checklist
KEY
Black = Perfusion
Blue = Oxygenation/Ventilation

# 5-Person Pit Crew CPR Example

**(3 EMR/BLS and 2 ALS)**