

**EMS SKILL**

**CARDIAC EMERGENCY: CARDIOPULMONARY RESUSCITATION**

**ADULT – 1 and 2 RESCUER CPR**

**PERFORMANCE OBJECTIVE**

Assess signs of cardiopulmonary arrest in an adult and perform one (1) and two (2) person cardiopulmonary resuscitation in compliance the 2015 Emergency Cardiac Care (ECC) standards.

**CONDITION**

Assess and perform cardiopulmonary resuscitation for an adult patient who appears to be unresponsive. Necessary equipment will be adjacent to the manikin or brought to the field setting.

**EQUIPMENT**

Adult CPR manikin, bag-mask (BMV) device, O2 connecting tubing, oxygen source with flow regulator, AED, oropharyngeal and nasopharyngeal airways appropriate for manikin, silicone spray, water-soluble lubricant, goggles, various masks, gown, gloves, suction, timing device, PCR form, airway bag.

**PERFORMANCE CRITERIA**

• Items designated by a diamond (⧫) must be performed successfully to demonstrate skill competency.

• Items identified by double asterisks (\*\*) indicate actions that are required, if indicated.

• Items identified by (§) should be practiced.

• Ventilations and compressions must be performed at the minimum rate required.

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| **PREPARATION** |
| **Skill Component** | **Key Concepts** |
| ⧫ Take body substance isolation precautions | • Mandatory personal protective equipment – gloves should be worn at all times• Situational - goggles, masks, gown as needed |
| ⧫ Assess scene safety/scene size-up***\*\* Consider spinal motion restriction (SMR) - if indicated*** | • If trauma is suspected, treat as a trauma patient. This is determined by the environment and information obtained from bystanders. |
| ⧫ Evaluate the need for additional BSI precautions  | • Situational - goggles, masks, gown as needed |
| § Approaches the patient and explains the care being delivered and transport destination to the patient/caregiver | • Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing.  |
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| **PROCEDURE**  |
| **Skill Component** | **Key Concepts** |
| ⧫ Checks responsiveness  ***\*\*Tap the shoulder and shouts “Are you OK?”***  | • You do not want to start CPR on a sleeping patient. Always tap the shoulder and shout “Are you OK?” * Healthcare Providers must call for help upon finding a patient unresponsive while continuing to assess the breathing and pulse. The goal is to get the AED to the patient ASAP.
* **DO NOT** start CPR in patients who meet the criteria for

 Reference No. 814 or 815. |

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| **Skill Component** | **Key Concepts** |
|  ⧫ Palpate for a carotid pulse while simultaneously assessing for breathing:  \*\****Check for a carotid pulse for up to 10 seconds***   ***\*\*Check for breathing for up to 10 seconds***   | • Palpate for a pulse at the same time as assessing breathing minimizes the delay in starting CPR.* The carotid pulse is located in the groove of the neck between the trachea and the neck muscles.
* To check for breathing, scan the patient’s chest for rise and fall for no longer than 10 seconds
* To check for breathing, scan the patient’s chest for rise and fall for no more than 10 seconds.
* Palpate carotid pulse on same side as the rescuer. **DO NOT** reach across the neck. An alternative to palpating a carotid pulse is to palpate the femoral pulse.

• If you are unsure if the patient has a pulse, begin chest compressions. Unnecessary CPR is less harmful than if CPR is not performed when indicated. |
| ⧫ Call for additional resources – if needed**\*\* *Request an AED -* *if notalready on scene*****\*\* *Move the patient onto a hard surface*** | • If two (2) rescuers are present, the 2nd rescuer should request ALS and get the AED• If a team is present: One (1)rescuer calls for ALS rescuer and defibrillator  One (1) rescuer starts chest compressions Two (2) rescuers provides ventilation with a BMV* If the patient is on a soft surface, place a board under the patient or move the patient to the floor.
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| ⧫ Move the patient onto a hard surface *– if indicated****\*\*Place a CPR board under the patient or move onto the floor*** |  * A hard surface allows for the compression of the heart between the chest wall and the vertebrae for increased blood flow.
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| ⧫ Expose the chest | * Exposing the chest aids with proper hand placement on the

 chest. |
| ⧫ Initiate chest compressions*:****\*\* Start compressions (C-A-B sequence)*** • Perform compressions of the lower ½ of breastbone (DO NOT compress on or over the xiphoid process).  • OR* Heel of one hand on the sternum and other hand on top of the 1st hand

 • Depth: at least two (2) inches  • Rate: 30 compressions at a rate of at least 100-120/minute (hard and fast) • Ratio cycle: 30 compressions to two (2) ventilations***\*\* DO NOT compress on or near the xiphoid process.******\*\* Allow for complete chest recoil between compressions******\*\* Attach the AED as soon as available*** | • **DO NOT DELAY THE INITIATION OF CHEST COMPRESSIONS.****Compression landmark:*** The heel of one (1) hand is placed on the center of the breastbone.

• While providers may use one (1) or two (2) hands, the two handed method is preferred in Los Angeles County.  **One (1) handed method:*** The heel of one hand is placed on the sternum while stabilizing the wrist with the opposite hand

**Two (2) handed method:** * Place the heel of one hand on top of the 1st hand
* Fingers may be extended or interlaced, but must be kept off the chest
* Shoulders directly over hands
* Arms straight and elbows locked - delivers force of compression straight down in order to be more effective
* Allow chest to return to normal position (chest recoil) after down stroke to allow blood to flow into the chest and heart (50% of time for down stroke and 50% for chest relaxation)

• Compressions need to be at least two (2) inches to be effective.* Delays/interruptions in chest compressions must be minimized to 10 seconds or less.

Continued….• Compression rate: A rate of at least 100-120/minute (speed of compressions) delivers fewer than 100-120/minute due to interruption of providing ventilations. The actual number is determined by the accuracy and consistency of the compression cycle (30 compressions should be delivered within 15-18 seconds or less).* The viability of organs is directly affected by perfusion and oxygenation. The longer a patient is without CPR, the greater the damage to vital organs.
* The AED should be used as soon as it becomes available. Continue CPR while charging.
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| **MAY SWITCH TO AED SKILL HERE** |
|  **Skill Component** | **Key Concepts** |
| ⧫ Resume chest compressions immediately if a shock has been delivered | * Pulse checks **ARE NOT** performed after a shock has been delivered.
* By resuming chest compressions immediately after shocking the patient, the chances for ROSC are increased.
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| ⧫ Open/Maintain a patent airway:• Medical - head-tilt/chin-lift• Trauma – jaw thrust***\*\* Clear/suction airway - if indicated******\*\* Consider nasopharyngeal or oropharyngeal airway - if indicated***  | • When a head, neck, or spine injury is suspected, use the jaw thrust maneuver.• If the jaw thrust maneuver does not open the airway to allow for adequate ventilation, use the head tilt-chin lift technique. |
| ⧫ Manage ventilations: • Give 2 breaths with BMV device or pocket mask -  (1 second/breath) ***\*\* Ensure adequate chest rise – may reposition*** ***head one (1) time if chest rise is not adequate*** ***\*\* Avoid excessive ventilation*** ***\*\* Perform continuous chest compressions If advanced airway is in place,*** * ***10 breaths per minute or breath one (1) every six (6) seconds,***
 | • While performing ventilations, use *only* enough force to allow for good chest rise. Over-inflation causes gastric distention which will affect tidal volume by elevating the diaphragm.* Do not make more than one (1) attempt to ensure adequate chest rise and fall as this causes unnecessary delays in resuming chest compressions.

• Using a BMV by a single rescuer is difficult and may not be as effective as a pocket mask due to inadequate seal and this may reduce the number of compressions delivered per minute.• Dentures should ***only*** be removed if they cannot be kept in place to prevent an airway obstruction. Fitted dentures maintain form for a good seal.• If an advanced airway is in place, perform continuous chest compressions. Ventilations are administered at a rate of 10 breaths/minute or (One (1) breath every six (6) seconds).   |
| ⧫ Establish a cycle of compressions to ventilation ratio of 30:2  | • A compression cycle consists of 30 compressions to 2 ventilations• Five (5) compression cycles should take approximately  2 minutes at a ratio of 30:2. |

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| **Skill Component** | **Key Concepts** |
| ⧫ Switch roles about every two (2) minutes – *if additional rescuers are available* \*\* Resumes CPR beginning with compressions at a rate of 100-120/minute and ending with two (2) ventilations  ***\*\* Establishes a compression to ventilation ratio of 30:2 for 1 rescuer*** ***\*\* Delivers two (2) breaths (Each breath over one (1) second)******\*\* Completes about two (2) minutes of CPR*** |  * Switching roles about every five (5) minutes prevents rescuer fatigue.

• Switching roles should take less than 5 seconds.* If using an AED, make switch when AED is analyzing to minimize interruption in compressions to 10 seconds or less.
* The universal rate for compressions in all cardiac arrest patients is 100 to 120/minute with the exception of neonates.
* A compression cycle consists of 30 compressions and 2 ventilations.
* 5 compression cycles should take approximately 2 minutes.
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| ⧫ Continue CPR until ALS arrives or patient shows signs of return of spontaneous circulation (ROSC) • If circulation is present and breathing is normal – place in recovery position and monitor for a pulse every five (5) minutes • If circulation is present, but breathing is absent or inadequate - continue with rescue breathing 10-12 ventilations/minute (1 breath every 5-6 seconds)  • If no circulation present - continue CPR ratio 30-2 | • Signs of return of circulation are movement and/or response to verbal or tactile stimuli• Signs of poor perfusion are pallor, mottling, cyanosis and altered level of consciousness.• Consider transport to the nearest receiving hospital after 20 minutes of EMS resuscitation if no other resources are enroute, -- Reference No. 502. • Paramedics are required to take the patient with ROSC to an approved STEMI receiving hospital – Reference No. 513. |
| **IF RETURN OF SPONTANEOUS CIRCULATION:** |
| **Skill Component** | **Key Concepts** |
| ⧫ Re-assess the patient about every five (5) minutes after return of spontaneous circulation (ROSC): • Check for:* **R**esponsiveness
* **P**ulse
* **B**reathing
 | • The main considerations of post-resuscitation are: - Check for a pulse about every five (5) minutes - Perform a primary and pertinent secondary assessment at least every five (5) minutes.• If a pulse is present and the patient is not breathing adequately, start ventilations utilizing a BMV or ventilate with advanced airway (placed by ALS provider) including end tidal CO2 monitoring. |
| ⧫ Perform rescue breathing - *if indicated* • Ventilation rate:* 10-12 breaths/minute (one (1) breath every 5-6 seconds)
* - Advanced airway – 10 breaths/minute (one (1) breath every six (6) seconds)

 | • If respirations are absent or inadequate, the rescuer must open the airway and ventilate the patient to prevent hypoxic injury to the brain and other organs.• Hypoxia may result in bradycardia which leads to cardiac arrest. |
| § Explain the care being delivered and the transport destination to the patient/caregivers | • Communication is important when dealing with the patient, family, or caregiver. This is a very critical and frightening time for all involved and providing information helps in decreasing the stress they are experiencing. |

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| **RE-ASSESSMENT****(Ongoing Assessment)** |
| **Skill Component** | **Key Concepts** |
| ⧫ Re-assess the patient at least every five (5) minutes once the patient has return of spontaneous respirations and circulation (ROSC):* **R**esponsiveness
* **P**ulse
* **B**reathing

***\*\* Manage patient’s condition as indicated.*** |  * This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient’s condition changes.
* Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient’s condition may deteriorate.
* The main considerations of post-resuscitation are:
* Check for a pulse about every five (5)minutes
* Perform a primary and pertinent secondary assessment at least every five (5) minutes.
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| **PATIENT REPORT AND DOCUMENTATION** |
| **Skill Component** | **Key Concepts** |
| § Give patient report to equal or higher level of care personnel  | • The patient report should consist of all pertinent information regarding the assessment findings, treatment rendered, and the patient’s response to care provided. |
|  * This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient’s condition changes.
* Unstable patients are patients who have abnormal vital signs, signs/symptoms of poor perfusion, or if there is a suspicion that the patient’s condition may deteriorate.
* The main considerations of post-resuscitation are:
* Check for a pulse about every five (5)minutes
* Perform a primary and pertinent secondary assessment at least every five (5) minutes.
 |  * This is an unstable patient and must be re-evaluated about every five (5) minutes if any treatment is initiated, medication administered, or if the patient’s condition changes.
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* The main considerations of post-resuscitation are:
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* Perform a primary and pertinent secondary assessment at least every five (5) minutes.
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 Developed: 11/01 Revised 10/2018



**CARDIAC EMERGENCY / CARDIOPULMONARY RESUSCITATION**

**ADULT - 1 OR 2 RESCUER CPR**

**Supplemental Information**

**DEFINITIONS:**

• *Recovery position* – Patient is turned onto their left side with their bottom arm underneath them, bent at the elbow, and hand near the head. The hand of the upper arm is near the cheek, and the upper leg is bent to stabilize the patient. No single position is perfect for all patients, but the recovery position is preferred to maintain a patent airway and spinal stability, minimize risk of aspiration, and limit pressure on bony prominences and nerves. It also allows for visualization of respirations and skin color, and provides access for needed interventions.

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| **COMPLICATIONS:**• Gastric distention• Rib fractures• Sternal fractures | • Separation of ribs from sternum• Laceration of liver or spleen• Pneumothorax | • Hemothorax• Lung and heart contusion• Fat emboli |

**PRECAUTIONS:**

• EMS personnel often deliver excessive ventilations during CPR which may result in:

 - increased intrathoracic pressure and impedance of venous return resulting in decreased cardiac output, cerebral blood flow, and coronary perfusion

 - air trapping and barotraumas in children with small-airway obstruction

 - increases risk of regurgitation and aspiration in children without an advanced airway

**NOTES:**

• An alternative to palpating the carotid pulse is palpating the femoral pulse.

• Chest compressions must be performed on a hard surface. If on a soft surface, place a board under the patient or move the patient to the floor.

• CPR cycle begins with compressions and ends with ventilations.

• The tongue is the most common cause of airway obstruction due to decreased muscle tone.

• The tongue and epiglottis may obstruct the entrance of the trachea due to inspiratory efforts creating negative pressure in the airway.

• Use the jaw thrust maneuver when a head, neck, or spine injury is suspected. If the jaw thrust maneuver does not open the airway to allow for adequate ventilation, use the head tilt-chin lift technique.

• If the patient is in a prone position with suspected trauma, the patient should be turned using log-roll method to avoid flexion or twisting of the neck or back.

• If the patient is breathing adequately with no signs of trauma, place in recovery position as soon as the primary assessment is complete and have suction immediately available. This prevents airway obstruction by the tongue and from mucus or vomitus.

* **DO NOT** hyperventilate patient; this increases intrathoracic pressure, decreases venous return to the heart, and diminishes cardiac output and survival.

• Insert an oropharyngeal or nasopharyngeal airway when using a BMV device for ventilation.

**POLICIES:**

• Reference No. 502 - Patient Destination

• Reference No. 510 - Pediatric Patient Destination

* Reference No. 513 – ST Elevation Myocardial Infarction Patient Destination

• Reference No. 814 - Determination/Pronouncement of Death in the Field

• Reference No. 815 - Honoring Prehospital Do-Not-Resuscitate (DNR) Orders

• Reference No. 815.1 - State of California EMS Prehospital Do-Not-Resuscitate (DNR) Form

• Reference No. 815.2 - Physician Orders for Life Sustaining Treatment (POLST) Form

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**ADULT - 1 OR 2 RESCUER CPR**

**Supplemental Information**

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| **COMPONENTS OF AN AIRWAY BAG:** |
| **BMV devices – adult, child, infant** | **Portable suction**  |
| **OP/NP airways – all sizes** | **Suction equipment– various sizes** |
| **Nasal cannula** | **Portable oxygen cylinder and oxygen regulator** |
| **Simple face mask – adult, child, and infants** | **Pulse Oximeter** |
| **Non-rebreather – adult, child, and infants** | **Water soluble lubricant** |