

S.O.P. #: 600-15

SUBJECT: CARDIAC ARREST MANAGEMENT

DIVISION: EMERGENCY MEDICAL SERVICES

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Objective: To outline the roles and expectations of all providers during a cardiopulmonary arrest.

Scope: This standard operational procedure is designed to supplement, not replace, the most current version of the Maryland Medical Protocols for EMS Providers as published and approved by the Maryland Institute for Emergency Medical Services Systems. In cases where this standard operational procedure and the protocols conflict, the protocols shall remain the standard of care.

Section 1: Overview

- A. This standard operational procedure defines how the Baltimore County Fire Department manages on-scene cardiac arrests utilizing the concepts of High Performance CPR and Code Resource Management.

Section 2: Crew Responsibilities on Scene

A. Officer

1. The officer's primary job is to serve as the BLS Crew Leader. It is the responsibility of the officer to monitor and coordinate the following tasks on scene.
  - a. Compression quality (proper rate, adequate depth and adequate recoil)
  - b. Compression rotation (all personnel should be aware of their next assignment at each rhythm analysis)
  - c. Keeping time
  - d. Collection point for all patient information (i.e., name, date of birth, history)
2. The officer shall staff this position continuously from the beginning of the cardiac arrest until the patient is transported or the resuscitation is terminated.

B. FADO

1. The driver's primary responsibility during the first compression rotation is to apply the Automated External Defibrillator (AED). During this timeframe, the driver also serves as the logistics coordinator.
2. The driver shall enter into the scene with the AED.
3. During the second, and subsequent, compression rotations crew assignment will be directed by the company officer.

C. Nozzle Firefighter (Engine Company) or Search Firefighter (Truck Company)

1. The primary responsibility is to initiate chest compressions during the first compression rotation.
2. The firefighter shall enter into the scene with the medical bag from the engine or truck.
3. During the second, and subsequent, compression rotations crew assignment will be directed by the company officer.

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- D. Backup Firefighter (Engine Company ) or Outside Vent Firefighter (Truck Company)
  - 1. The primary responsibility is to place a BLS airway adjunct and initiate ventilations during the first compression rotation.
  - 2. The firefighter shall enter into the scene with the oxygen bag from the engine or truck.
  - 3. During the second, and subsequent, compression rotations crew assignment will be directed by the company officer.
- E. Paramedic (Primary Care Provider on Medic Unit)
  - 1. The paramedic is responsible for providing and directing all patient care considerations during the code.
    - a. The paramedic must remember that continuous, quality compressions are the priority during the resuscitation and must not interfere with the BLS crew's objective to accomplish this.
  - 2. The paramedic is expected to consider and/or perform the following tasks independently.
    - a. Medication administration
    - b. Rhythm identification
    - c. Manual defibrillation
    - d. Transcutaneous pacing or synchronized cardioversion
    - e. Intraosseous access
- F. Emergency Medical Technician (Secondary Care Provider on Medic Unit)
  - 1. The EMT is primarily responsible for securing peripheral IV access on the patient.
    - a. If the individual functioning in the EMT role is not a certified IV technician, this task is delegated to the paramedic.
  - 2. Following IV placement, it shall be the discretion of the BLS crew leader as to how to involve the EMT.
    - a. It is recommended that the EMT obtain patient history and information and then relay this information to the company officer.
- G. EMS Lieutenant (Supervisor)
  - 1. The EMS Lieutenant shall serve as the senior medical authority on all cardiac arrest calls. It shall be his/her responsibility to ensure that all aspects of patient management are considered and performed.
  - 2. Once verifying that all aspects of patient management are considered, the supervisor shall be responsible for counseling the family and keeping them apprised of the status of the resuscitation. The EMS Lieutenant shall serve as the liaison between the family and the crews on the scene.

Section 3: Procedure for Utilizing Automated External Defibrillator

- A. The AED shall be applied at the earliest possible moment and the prompts shall be followed.
  - 1. Do not interrupt chest compressions to remove clothes or place multifunction pads.
- B. Perform one asynchronous ventilation every tenth chest compression.
- C. Stand clear of AED while it analyzes the heart rhythm.
  - 1. Crews should take advantage of the time the AED takes to analyze to switch roles.
- D. If AED advises to deliver shock, perform chest compressions while AED charges.
  - 1. When AED has completed charging, "hover" hands above the patient's chest. The firefighter operating the AED shall clear and shock the patient and chest compressions will resume immediately. Do not stop for a pulse check.

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- E. If the AED advised no shock, perform a pulse check for ten seconds or less.
  - 1. If, at ten seconds, a pulse is not felt or providers are unsure, continue CPR.
- F. Chest compressions shall only be stopped during the two minute cycle if the patient can no longer tolerate chest compressions (i.e., they wake up).
- G. It is not necessary to keep time when using te AED as this is done automatically. Switch roles at each analysis.
- H. If ALS arrives during the two minute cycle, continue to use the AED until the end of the cycle. After the AED has advised a shock disposition, then ALS crews should switch to the manual defibrillator and the two minute cycle should begin. There should not be a manual rhythm check until the end of that cycle.

Section 4: Procedure for Utilizing Manual Defibrillator/Cardiac Monitor

- A. The cardiac monitor shall remain in “Paddles” mode for the duration of the entire cardiac arrest when chest compressions are being performed. The limb leads are not necessary during the active resuscitation. If a pulse is restored, the provider then may switch the cardiac monitor to the limb lead view.
  - 1. Leaving the monitor in “Paddles” mode allows for the collection of compression data which is invaluable for crew feedback.
- B. During the last fifteen (15) seconds of the two (2) minute CPR cycle, the ALS provider shall charge the monitor to the appropriate energy setting in anticipation of delivering a shock. CPR shall continue until the two (2) minute mark.
- C. At the two (2) minute mark, the BLS crew will rotate. While the crew is rotating, the ALS provider shall visualize the underlying cardiac rhythm and treat as appropriate.
  - 1. If the rhythm is shockable, the ALS provider shall clear the patient and deliver a shock. CPR shall immediately resume after the shock.
  - 2. If the rhythm is not shockable, the ALS provider shall depress the round selector knob on the Lifepak 15, thereby dumping the energy.
    - a. A pulse check shall be performed for no longer than ten (10) seconds, when appropriate. If, at ten (10) seconds, a pulse is not felt or providers are unsure, continue CPR.
- D. The BLS crew shall perform one asynchronous ventilation every tenth chest compression, regardless of the manner in which the airway is managed (i.e., BLS Airway, Endotracheal Intubation, King Airway).
- E. Each time the BLS crew rotates, the provider compressing the chest shall “hover” their hands above the patient’s chest and await direction from the ALS provider.

Section 5: Cardiac Arrest Goals

- A. At all points during the resuscitation, providers shall perform continuous, high-quality chest compression at a rate of ten (10) chest compressions to one (1) ventilation. Each ventilation shall be given while compressions continue.
- B. Rotations shall be built around two (2) minute cycles. BLS crews shall switch roles every two (2) minutes regardless of the level of fatigue. This ensures that quality chest compressions are being performed.
- C. The BLS crew shall attach, and attempt to utilize, the automated external defibrillator at the earliest possible moment, unless they arrive on scene concurrently with an ALS unit who has immediate access to their cardiac monitor.
- D. The BLS crew shall attempt to insert a BLS airway adjunct (oropharyngeal or nasopharyngeal airway) at the earliest possible point in the cardiac arrest.

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- E. Pauses in chest compressions should not exceed ten (10) seconds at any point throughout the arrest when using the ALS cardiac monitor.
  - 1. Utilizing the AED will require the crew to exceed ten (10) seconds in most instances.
  - 2. Crews should attempt to minimize hands off time while extricating/moving patients as much as possible. In most cases, this may require the crew to exceed ten (10) seconds.
- F. Crews should not stop chest compressions for ALS interventions. This includes IV/IO placement and advanced airway placement. This must be accomplished with ongoing CPR.
- G. In most instances, crews should attempt to initiate and work the code where the patient is found before moving to the medic unit. The patient should be moved to a location on the scene that is conducive to working the arrest for least fifteen (15) minutes.
- H. Crews shall strive for a chest compression fraction (CCF) of greater than ninety percent (90%). CCF is the measure of time that CPR was performed against the measure of time CPR was required.
- I. Crews shall strive for an average compression rate of between 100 and 120 compressions per minute.

Section 6: Post-Run Actions and Quality Assurance

- A. Following every cardiac arrest, the ALS provider shall ensure that the eMEDS report is completed in an accurate manner.
  - 1. Times are required for all interventions. Use of the "EVENT" button on the cardiac monitor is highly recommended to ensure accurate time information.
  - 2. All information on the "Cardiac Arrest" tab in eMEDS is required. Regardless of whether or not the software shows this information as mandatory.
- B. All data from the cardiac monitor shall be transmitted to CodeStat immediately upon completion of the call.
- C. If an Automated External Defibrillator was applied and used to analyze a rhythm, the EMS District Officer shall be notified within twenty-four (24) hours of the call. The EMS District Officer shall be responsible for interrogating the AED and loading the data into CodeStat.
- D. There shall be one EMS Officer designated as the CodeState Administrator who shall serve as the primary point of contact for coordinating all cardiac arrest quality assurance matters. He or she shall maintain the department's Cardiac Arrest Tracking System.
- E. Select EMS Officers will serve as CodeStat Annotators. These individuals will review CodeStat Cases assigned to them and collect information from various sources and provide this information to the CodeStat Administrator.
- F. The CodeStat Administrator shall review eMEDS once weekly and identify those cases which meet the criteria for quality assurance measurement.
  - 1. Any out-of-hospital, non-traumatic cardiac arrest where any personnel from the Fire Department attempt resuscitation (chest compressions, ventilations, and/or defibrillation) shall be included for analysis.
- G. Based upon the weekly review, the CodeStat Administrator shall assign each case to one of the CodeStat Annotators.
- H. The CodeStat Annotator shall review the case and make annotations as appropriate in the CodeStat Reviewer software. The case shall be exported to a .pco file and forwarded, along with the case tracking form, to the CodeStat Administrator.
- I. The case tracking form shall be completed by the annotator. Every available effort should be made to ensure that data provided is as accurate as possible. Utilizing NFIRS is the preferred method of obtaining unit times. This form shall be forwarded to the CodeStat Administrator.

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- J. CodeStat Annotators will have fourteen (14) days to complete and return the case from the date it was assigned.
- K. Once the CodeStat Administrator receives the QA reports back from the annotators. The Cardiac Arrest Report shall be forwarded to the officers of the crews involved.
- L. Crews are encouraged to utilize this data for informal post-incident analyses or case reviews. These reports and PIA's are aimed at improving performance in future incidents. The reports obtained from CodeStat are not to be used in any punitive manner.