

# Region I STEMI Plan

I Purpose: To outline the Emergency Medical Services Region I (Allegany and Garrett counties) STEMI plan which will include initial patient contact (911 call) through the time that cardiac intervention is complete.

## II Definitions:

- A. STEMI: ST Segment Elevation Myocardial Infarction
- B. WMRMC: Western Maryland Regional Medical Center
- C. GCMH: Garrett County Memorial Hospital
- D. ALS: Advanced Life Support
- E. BLS: Basic Life Support
- F. EMS: Emergency Medical Services
- G. ED: Emergency Department
- H. ECG: Electrocardiogram
- I. E2B: Time the Emergency System is accessed by or for the patient (911 call) to Cardiac Balloon Intervention
- J. CIC: Cardiac Intervention Center

## III Plan Goals

A. To develop a Region I STEMI System that when implemented, will result in decreased mortality and morbidity in the MIEMSS Region I. In order to accomplish this, a number of specific processes are essential. These are:

1. The ability to rapidly and accurately identify patients suffering from STEMI. This term used throughout the plan refers to the current STEMI definition by the American College of Cardiology (ACC) and American Heart Association (AHA), ST –segment elevation myocardial infarction.
2. If possible patients who have sustained a STEMI event should receive care in a hospital that has a primary percutaneous coronary intervention program [pPCI] in place which is capable of providing immediate and comprehensive assessment, resuscitation, intervention, and definitive care. Additionally, receiving hospitals must provide access to rehabilitation programs and participate in data collection.
3. Continuous and effective region-wide coordination of pre-hospital and hospital care resources, so that STEMI patients will be most expeditiously transported to the closest available cardiac intervention center. This process requires a method of tracking the interventional care capabilities for STEMI patients and reviewing the quality of the process itself.
4. An ongoing and effective Quality Improvement (QI) Program, in order to assure continuing appropriate function in providing the highly specialized care necessary in the management of STEMI. This program will include evaluation of: pre-hospital management, hospital management, and overall system function. Collection of a standard pre-hospital dataset will be required. Hospitals will meet MHCC and MIEMSS regulatory requirements for data collection.

5. The goal is that no greater than 90 minutes lapses between the 9-1-1 call time (E) and the time that the patient undergoes pPCI (B) for a minimum of 75% of STEMI cases in Region I.

## B. Regional STEMI Plan Overview

1. A Region I STEMI Committee comprised of the regional leaders in EMS, Emergency Medicine, and Cardiology has developed a plan for a Regional STEMI System that meets the goals set forth in the previous section. The components, to some degree, have separate and individual identities and functions; however, there should be an understanding, a desire, and willingness to work together in a unified effort to reach the end result.

2. Systems require oversight of project concept, overall responsibility, developmental aspects, implementation, and evaluation of continuing activities. The Maryland Institute for Emergency Medical Services Systems has the responsibility for coordinating pre-hospital EMS activities throughout the State of Maryland.

3. The Regional STEMI System involves the organization of already existing resources into a program providing comprehensive care for STEMI patients through all phases of their management from the moment of onset through rehabilitation. The two basic patient management components of this system are the pre-hospital providers and individual hospital organizations.

4. The system function involves the implementation of the STEMI protocol from the *Maryland Medical Protocols for EMS Providers* and STEMI triage criteria included in this Plan. Based upon need, modifications and additions may be developed by the Region I STEMI Committee.

5. Hospitals participating in this system and receiving STEMI system patients will have organized response systems, including:

- a) Equipment and facilities
- b) Trained and committed personnel
- c) Organized management protocols

6. The Emergency Department plays a critical role in STEMI management. Rapid availability of a cardiologist and the ability to perform interventional cardiology care are pivotal services in determining the survival and recovery of STEMI patients. Emergency Medicine and Cardiology leadership of hospital STEMI programs is therefore essential in order for hospitals to participate in the STEMI System. This leadership role must be clearly defined within the Hospital STEMI Plan along with specific appropriate authority to carry out that leadership role. Evidence of continuing leadership should be demonstrated through emergency physician and cardiologist participation in the Regional STEMI System activities and through the individual hospital QI programs.

## C. Region I STEMI Committee

1. The Region I STEMI Committee will be responsible for the implementation of this plan. Committee membership will be comprised of representatives from the following:

- a) CIC Hospitals:
  - (1) Cath team members
  - (2) Emergency Physicians
  - (3) Cardiologists
  - (4) Hospital Administration
  - (5) Emergency and/or STEMI Nursing
- b) Non CIC Hospitals:
  - (1) Emergency Physicians
  - (2) Hospital Administrators
  - (3) Emergency Nurses
- c) Pre-Hospital Jurisdictions:
  - (1) Pre-hospital EMS Providers
  - (2) EMS Service Leadership
- d) Other Representation:
  - (1) Regional and Jurisdictional EMS Medical Directors
  - (2) MIEMSS Regional Administrators
  - (3) MIEMSS Office of Hospital Programs

The duties of the Region I STEMI Committee include the review of the overall function of the STEMI program including hospital and pre-hospital activities. This review will evaluate the adequacy of these various activities and aid in the development of system function reports and recommendations regarding the hospital or pre-hospital components or functions, including responsibilities, standards, and activities. If recommendations directly involve pre-hospital aspects of the STEMI program they will be referred to the Office of the State EMS Medical Director. Recommendations for hospital aspects will be referred to the Office of Hospital Programs for review.

#### IV. Regional STEMI System: Components and Organization

##### A. Pre-hospital Component

1. EMS Units are an integral part of the Regional STEMI System. All EMT Basics, Intermediates, and Paramedics need to have a basic knowledge and awareness of the Regional STEMI System elements and system function. This specifically refers to the activation criteria (identification of a STEMI) and communications procedures.

- a) On-line and off-line medical control physicians within the Region will also need to be aware of the Regional STEMI System elements and system function.

## B. Hospital Component

1. Each CIC must have an Emergency Physician and a cardiac interventionalist responsible for oversight of the STEMI Program. This responsibility includes:

- a) Maintain compliance with MIEMSS and MHCC regulations
- b) Oversight responsibility for the Hospital STEMI QI Program and participation in Regional STEMI System administrative and QI activities as per the Regional STEMI Plan, including data collection and reporting.

2. Non-CIC Hospitals:

In certain instances when STEMI patients may present to a hospital without PCI capability and cannot be transferred to a PCI center for intervention within 90 minutes of first medical contact, they should be treated with fibrinolytic therapy within 30 minutes of hospital presentation, unless contraindicated. Each Non CIC hospital must:

- a) Establish and maintain basic STEMI treatment plans / clinical pathways to evaluate the appropriateness of thrombolytic therapy versus patient transfer to a CIC.
- b) Establish and maintain transfer agreements with CIC in accordance with the 90 minute 9-1-1 to Balloon time goal for a minimum of 75% of all cases.
- c) Participate in Regional STEMI System QI activities as per the Regional STEMI Plan, including data collection and reporting on but not limited to door to needle times and interfacility transfer times.
- d) Develop and establish rapid interfacility transport agreements to include air and land transport capabilities.

3. Communications are critical to the function of the STEMI System, Communications provide:

- a) Essential knowledge of the overall status of pre-hospital STEMI activities and hospital resource availability on a continuous basis.
- b) Access to system organization and function protocols whenever such information is requested by pre-hospital personnel or hospital based personnel.
- c) A link between the prehospital providers and CICs and or non CICs for the rapid exchange of information including 12 lead ECG findings resulting in efficient pre-hospital care provision and hospital preparation for STEMI patient arrival.
- d) Collection of uniform System-wide data for QI activities.
- e). Providing all of these functions to the entire System on a continuous basis requires a central communications facility with constant communications capabilities to all pre-hospital units and participating hospitals, plus the ability to immediately and directly link the pre-hospital providers to both CIC and non CICs. This central communications will be facilitated by the existing Emergency Medical Resource Center (EMRC). EMRC maintains knowledge of the functional status of all system hospitals at all times and establishes a communication link between the EMS provider and receiving facility.

### C. Data / Quality Improvement Component

1. This component is essential for function of the Regional STEMI System. There is a need to evaluate the system function to determine continuing effectiveness in the management of STEMI. The QA/QI committees of Allegany and Garrett counties, along with both hospitals, will review all STEMI activations and report their findings to the Regional STEMI committee. The Individual QA/QI Committees will examine overall STEMI emergencies, care and outcomes, and provide information for use in potential STEMI research studies. The STEMI committee will develop and maintain a STEMI QI dataset. This Data set shall include, but not be limited to, data components from:

- (1) CAD
- (2) Pre-hospital patient care reports
- (3) CIC data and EMS feedback reports
- (4) Non-CIC data and EMS feedback reports

D. The STEMI committee will document continuing function and allow the implementation of improvements to the Regional STEMI System. This program will be Regionwide, with the individual EMS jurisdictions and hospitals performing their own QI evaluations and reporting to the Region I STEMI committee. The appropriateness, quality and quantity of all activities in the system must be continuously monitored in the areas of pre-hospital care, medical care of the patients in the hospitals and overall system function. The following basic QI processes should be considered by each individual entity:

1. Assignment of a QI manager to oversee the organizational process and coordinate all STEMI system QI activities.
2. Development of a written QI program to evaluate STEMI patient care.
3. Establishment of a QI data collection method.
4. Completion of QI evaluations by the individual system participants. Cases to be evaluated include specific automatic criteria such as major complications and death, as well as those cases which are requested for review by those involved in the care of the patient.
5. Determination of the presence (or absence) of QI issues through the data evaluation process.
6. The provision for an appropriate feedback mechanism for STEMI cases initiated in the pre-hospital EMS setting.
7. Development and implementation of corrective action plans.
8. Re-evaluation of the efficacy of the corrective action plan.

### V. System Operations

A. System operations refers to the activities that occur once it is determined a patient meets system activation criteria and communications has been established within the system. These activities include CIC destination determination, continuing communications, provision of field care, patient transport, and CIC.

## B. Region I STEMI Activations, Pre-hospital Emergency Services

### 1. Region I ALS Units

- a) All ALS units will obtain a 12 lead ECG from patients presenting cardiac symptoms.
- b) Allegany County ALS providers will interpret the ECG. If a STEMI is present the provider will notify WMRMC ED via radio that they are declaring a STEMI patient. The ALS unit will expedite transport to WMRMC.
- c) Garrett County ALS units will transport STEMI patients to the closest CIC unless they are within a 15 minute drive time to GCMH, if 15 minutes or less to GCMH they will transport to that facility. The ALS provider will advise the receiving ED as soon as possible they have a STEMI patient en route.
- d) Air transportation should be considered when the STEMI patient is 30 min away from a CIC and it will save time and be of clinical benefit.

### 2. Region I BLS Units

- a) All BLS units with staff trained in administering 12 lead technology will obtain a 12 lead ECG on patients presenting cardiac symptoms.
- b) BLS units will send the 12 lead ECG to WMRMC via radio using the Rosetta System, if a STEMI is declared by the ED Physician the ED physician will advise the EMS unit of where the patient is to be transported.
- c) Garrett County units will send the 12 lead via radio using the Rosetta System to WMRMC for detection of STEMI, if a STEMI is declared the EMS provider will dual consult with WMRMC and GCMH and follow medical direction of where the patient will be transported.
- d) Air transportation should be considered when the STEMI patient is 30 min away from a CIC center and it will save time and be of clinical benefit.

### 3. Transportation changes and considerations

- a) Any significant patient condition changes are to be communicated directly to medical direction at the receiving hospital as those changes may result in an alteration of the destination hospital STEMI Team activation.
- b) If the patient is or becomes unstable (inadequate spontaneous ventilations without a secured airway or in cardiac arrest) the patient should be transported to the closest hospital.
- c) Air transportation can be considered if ground transportation would deplete limited EMS resources in the surrounding area.
- d) If neither ground nor air transportation of a STEMI patient to a designated CIC is achievable within an acceptable amount of time according to protocols, the STEMI patient shall be transported to the nearest emergency department. Adverse weather, traffic related issues, medevac availability may impact the ability to deliver a STEMI patient directly to a designated CIC.

- e) If there is a disagreement during a dual consult, the provider will follow orders given by WMRMC.

### C. Region I STEMI Activations, Hospital Operations

#### 1. WMRMC STEMI Activation

- a) The ED after receiving a declaration of a STEMI patient from an ALS provider or a 12 lead ECG with a STEMI present from the field shall begin their procedures for activating the STEMI team.
- b) The ED shall follow the procedures outlined in the STEMI binder once a STEMI has been declared by pre-hospital provider or ED physician

#### 2. GCMH STEMI Activation

- a) The ED after receiving a declaration of a STEMI patient from an ALS provider shall advise the field providers that the patient should continue transport to GCMH if within 15 minutes, or be transported to the nearest CIC center if not within 15 minutes of GCMH (time variables include geography, nature of the call, weather, etc.).

### D. Interfacility Transfers

1. The emergency department receiving the STEMI patient bears the responsibility of securing transportation to a Cardiac Intervention Center, if appropriate.
2. The emergency department may make use of: a licensed commercial medevac OR Maryland State Police Medevac if commercial service is unavailable and as long as appropriate staffing and equipment is available.
  - a) or a licensed commercial specialty care ground transport ambulance service.
3. If these services are not available in a clinically reasonable time;
  - a) a licensed commercial ground ALS ambulance service may be used as long as appropriate staffing and equipment are provided.
  - b) a jurisdictional ALS ambulance may be used as long as appropriate staffing and equipment are provided.
4. The method of transportation shall be based on the patient's needs and the mode that will most rapidly deliver the patient to the CIC.
5. The transferring hospital should maintain access to the current *MD Medical Protocols for EMS Providers* and the scope of practice for pre-hospital EMS providers when preparing a STEMI patient for transfer.
6. Any significant patient condition changes during patient transfer are to be communicated directly to medical direction at the receiving CIC as those changes may result in an alteration of the destination hospital STEMI Team activation.

