



MISSISSIPPI STATE DEPARTMENT OF HEALTH

Mississippi STEMI System of Care Plan

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Office of EMS & Acute Care Systems
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Introduction

Introduction

Legal Authority and Purpose

Section § 41-3-15 of the Mississippi Code 1972 Annotated, as amended, provides the general powers, duties and authority of the State Board of Health and certain powers of the Mississippi State Department of Health. Included in this is the State Board of Health powers and duties to formulate the policy of the State Department of Health regarding public health matters within the jurisdiction of the department; to adopt, modify, repeal and promulgate, after due notice and hearing, and enforce rules and regulations implementing or effectuating the powers and duties of the department under any and all statutes within the department's jurisdiction, and as the board may deem necessary; to apply for, receive, accept and expend any federal or state funds or contributions, gifts, trusts, devises, bequests, grants, endowments or funds from any other source or transfers of property of any kind; and to enter into, and to authorize the executive officer to execute contracts, grants and cooperative agreements with any federal or state agency or subdivision thereof, or any public or private institution located inside or outside the State of Mississippi, or any person, corporation or association in connection with carrying out the provisions of this chapter, if it finds those actions to be in the public interest and the contracts or agreements do not have a financial cost that exceeds the amounts appropriated for those purposes by the Legislature. The State Board of Health shall have the authority, in its discretion, to establish programs to promote the public health, to be administered by the State Department of Health. Specifically, those programs may include, but shall not be limited to, programs in the areas of chronic disease and other such public health programs and services as may be assigned to the State Board of Health by the Legislature or by executive order.

The State Board of Health approved the first STEMI System of Care Plan in 2011. The State Board of Health also established a 28 member STEMI Advisory Council which is co-chaired by physicians representing cardiology and emergency medicine. In addition, the STEMI Advisory Council is made up of a representative from the American Heart Association, a cardiac surgeon, the three STEMI regional coordinators, and one representative for each STEMI region (northern, central, and southern) in each of the following disciplines: emergency medicine, emergency nursing, hospital administration, interventional cardiology, STEMI nursing, nationally recognized heart attack registry, EMS, and EMS administration. Members are appointed by the State Board of Health for a three-year term and may be reappointed.

The State Board of Health's intent for STEMI System of Care was to reduce death and disability resulting from STEMI events in Mississippi. MSDH is assigned the responsibility for creating, implementing and managing the statewide STEMI System of Care. The Department shall develop and administer STEMI regulations that include, but are not limited to, the Mississippi STEMI System of Care Plan, STEMI Care System standards, STEMI center designations, field triage, interfacility STEMI transfers, EMS aero medical transportation, STEMI data collection, and STEMI Care System evaluation. The Department shall cause the implementation of both professional and lay STEMI and cardiovascular education programs. These STEMI educational programs shall include both clinical STEMI education and cardiovascular disease prevention.

The Department has taken the necessary steps to develop, adopt and implement the Mississippi STEMI System of Care Plan and associated STEMI Care System regulations necessary to implement

the STEMI System of Care. The effective date of this *Mississippi STEMI System of Care Plan* is October 9, 2024, and it remains in effect until superseded by a later *Plan*.

System Introduction

ST-elevation myocardial infarction (STEMI) is a significant public health problem and carries a high risk of death and disability. The American Heart Association (AHA) estimates that in 2021, coronary heart disease caused 375,476 deaths in the United States (Martin, et al., 2024). However, it is important to note that not all coronary heart disease cases are STEMI. Mississippi currently is second highest in the nation in mortality and morbidity from cardiovascular disease (Elflein, 2024).

Over the past decades, advances in the treatment of STEMI have resulted in dramatic reductions in death attributed to STEMI. Rapid reperfusion of the STEMI patient, utilizing either fibrinolytic therapy, or primary Percutaneous Coronary Interventions (PCI), is the most important therapy in reduction of death from STEMI heart attacks (Partow-Navid et al., 2021).

Numerous studies have shown a mortality and morbidity advantage with primary PCI when this therapy can be delivered in a timely manner. The American College of Cardiology (ACC)/AHA guidelines and the European Society of Cardiology guidelines for STEMI agree that early and complete reperfusion is optimal, with the door-to-balloon time of 90 minutes and the door- to- needle time of 30 minutes (Partow-Navid et al., 2021).

STEMI patients should be recognized as quickly as possible to identify those eligible for thrombolytic or primary PCI therapy. Research has shown that both morbidity and mortality can be reduced by rapid reperfusion therapy. Timely primary PCI within ninety (90) minutes of first medical contact is the preferred treatment in STEMI management. However, if the patient presents at a non-PCI center and is unable to receive primary PCI within 120 minutes, administration of fibrinolytic therapy within 30 minutes is a preferred alternative perfusion therapy if there are no patient contraindications. (Jneid et al., 2017). Additional research has demonstrated that in-the-field recognition by pre-hospital providers utilizing 12- lead ECG, coupled with pre-hospital notification of the receiving facilities, can further reduce time to reperfusion, resulting in improved outcomes (Jacobs et al., 2021)

Mississippi Facts

Cardiovascular disease (CVD) encompasses both coronary heart disease and stroke, complications of hypertension, and diseases of the arterial blood vessels. Mississippi's CVD mortality is the second highest in the nation (Elflein, 2024). According to Mississippi Vital Records, nearly one third of all deaths in Mississippi in 2021 were caused by CVD and it is a major cause of premature disability among working adults (*MSTAHRs - Mississippi Statistically Automated Health Resource System*, 2021) More Mississippians die each year from CVD than from all types of cancer, traffic injuries, suicides, and AIDS combined. A substantial number of these deaths are premature: one in four CVD deaths in 2022 occurred in Mississippians under 65 years old. In 2022, Mississippi reported 8,865 deaths from heart

disease and 1,943 from cerebrovascular disease (stroke) (Mississippi State Department of Health, 2020). The two combined accounted for nearly one third of all the deaths reported that year and more than 29.7% of the total from the ten leading causes of death. In 2020, approximately 1 in 10 (11.7%) Mississippi adults reported ever being told they had CVD. The percentage having CVD was significantly higher among males (13.8%) compared to females (9.9%) and significantly higher among white non-Hispanic respondents compared to black (9 =.1%). In addition, the percentage of respondents was significantly higher among white non-Hispanic respondents as compared to white non-Hispanic females (10.9%), black non-Hispanic males (9.9%) and black, non-Hispanic female (8.5%) respondents. Moreover, it is reported that the percentage of Mississippians having CVD increased as age increased and was significantly higher among adults 65 years of age and older (26.5%). The second highest age group reporting they had been diagnosed with CVD was 55 to 64 years of age (Mississippi State Department of Health, 2020).

ST-elevation myocardial infarction (STEMI) remains a critical issue for public health in Mississippi, presenting significant risks of fatality and long-term health complications. Prior to the establishment of the STEMI System of Care, the state's in-hospital mortality rates for STEMI incidents were above the national average. However, there was a notable decrease in 2012, with mortality rates falling from 6.7% to 6.4%. And in 2018 mortality rates falling to 4.18%. Although there was an uptick in 2021 during the pandemic, with mortality rates climbing to 6.47% for all heart attack patients, the trend has since reversed. As of early 2023, the in-hospital mortality rate for all heart attack patients in Mississippi has declined to 5.01%.

Activities provided in this plan support the Mississippi State Plan for Cardiovascular Disease and Stroke Plan by developing a system to increase the survival rate from cardiac arrest, heart attack, and stroke in Mississippi.

Chronology of STEMI Care in Mississippi

The first STEMI System of Care Plan was developed in 2011 and approved by the Mississippi State Board of Health on June 20, 2011. Additionally, HB 1613 passed during the 2012 Legislative session appropriating \$200,000 from the Tobacco Trust Fund to support the STEMI program. Similar funding from the Tobacco Trust Fund of \$200,000 was approved through HB 1667 in the 2013 legislative session and HB 1495 in the 2014 legislative session for the STEMI program. The American College of Cardiologists presented the state of Mississippi chapter with a recognition award for the new state STEMI project in 2013.

Similarly, funding has been appropriated throughout the years to support the System.

Mississippi STEMI System of Care Plan

Mississippi STEMI System of Care Plan

This Plan outlines the statewide system for the care of STEMI victims in Mississippi. 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. Authority for planning, coordination, and evaluation of the system is centralized within the Office of EMS and Acute Care Systems. However, because Mississippi is truly a rural state, primary transport to a receiving percutaneous coronary intervention (PCI) program is not a viable option in some instances. Initial resuscitation and stabilization efforts in some cases must be accomplished at closer, local facilities. The goal is an inclusive model, matching appropriate responses to the needs of the patient.

Vision

The Mississippi STEMI System of Care Plan, when fully implemented throughout Mississippi will result in decreased mortality and morbidity from STEMI events.

Plan Goals

- Develop the ability to rapidly and accurately identify patients suffering from STEMI.
- For patients who have sustained a STEMI event, assure that they receive care in a hospital that has a primary percutaneous coronary intervention program (PCI) 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.
- Assure continuous and effective coordination of pre-hospital and hospital care resources, so that STEMI patients will be most expeditiously transported to the most appropriate facility capable of Primary PCI, even if that means bypassing the closest Emergency Department.
- Assure that all Mississippi citizens with evidence of STEMI have immediate access to PCI-capable hospitals, regardless of bed availability or capacity.
- Maintain 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 the evaluation of pre-hospital management, hospital management, and overall system function. Pre-hospital data collection may be done through the Mississippi EMS Information System (MEMSIS) or activation notification platform.
- Assure a role for all Mississippi hospitals in the STEMI system.
- Participation of all participating hospitals in the nationally recognized heart attack cardiac database utilized and approved by the STEMI System of Care PI and Advisory committees.
- Assure that all citizens and visitors to Mississippi are aware of the statewide STEMI system.

- Provide education to the citizens of Mississippi in cardiovascular disease prevention.

System Performance Measure

The state median will be no greater than 90 minutes lapse between first medical contact and the time the patient undergoes PCI for a minimum of (90%) of STEMI cases in Mississippi.

Figure 1 indicates the percentage of patients who receive an intervention within 90 minutes from first medical contact. Figure 2 shows the median minutes from first medical contact to PCI for Mississippi and the Nation.

Figure 1

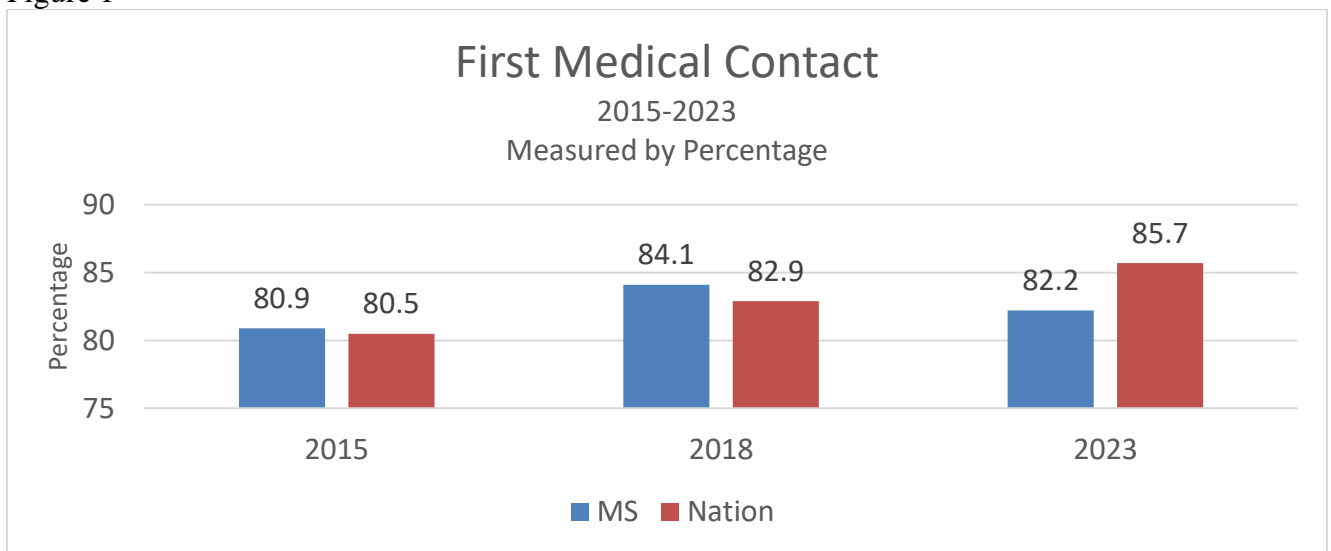
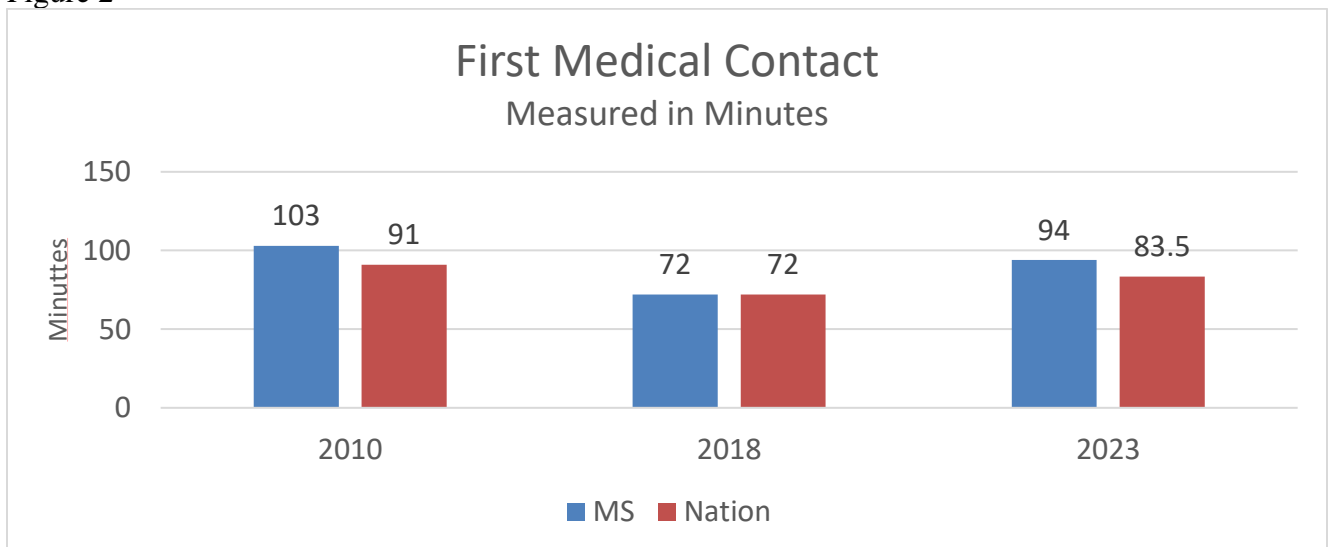


Figure 2

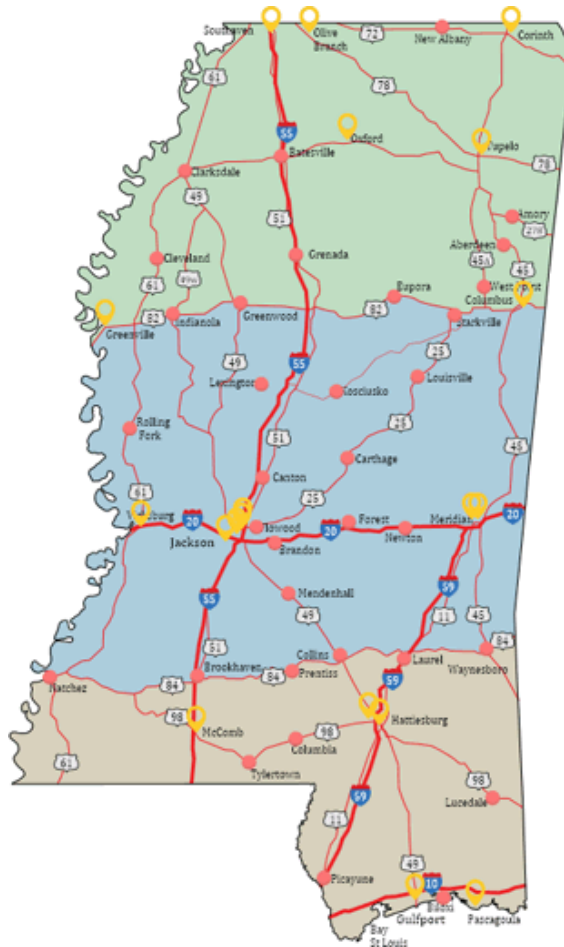


Data Sources: Mission Lifeline® and NCDR CP-MI Registry™

Regional STEMI Coordination

The Mississippi statewide inclusive STEMI System of Care is based on the concept of regional coordination and education. The state has been divided into three (3) STEMI regions - North (along and north of Highway 82), Central, and South (along and south of Highway 84). A STEMI Coordinator has been identified for each region. The map in Figure 3 indicates the three region areas and yellow circles indicate the current hospitals approved for PCI services.

Figure 3 – STEMI Regional Map



Goals

- Maintain a coordinated Regional STEMI System.
- Assure that all STEMI Regions work in harmony with other STEMI Regions.
- Maintain a system of funding for the STEMI Regions.

STEMI System Design

The STEMI Advisory Council is appointed by the Mississippi State Board of Health and is comprised of the leaders in cardiology, EMS agencies, emergency medicine, hospital administration, emergency nursing, STEMI nursing, registrars from a nationally recognized heart attack registry, EMS administration, and the American Heart Association. The STEMI Advisory Council provides advice and recommendations to the Board and the Department on the STEMI System and has developed a plan for STEMI that meets the plan goals established above. The components, to some degree, have separate and individual identities and functions; however, there should be an understanding, a desire, and a willingness to work together in a unified effort to reach the end result. If recommendations directly involve pre-hospital aspects of the STEMI program, they will be referred to the EMS Advisory Council and the Office of EMS and Acute Care Systems for review.

Systems require oversight of project concept, overall responsibility, developmental aspects, implementation, and evaluation of continuing activities. The Mississippi State Department of Health Office of EMS and Acute Care Systems has the responsibility for coordinating the STEMI system and the responsibility for coordinating pre-hospital EMS activities throughout the State of Mississippi. The Office of EMS and Acute Care Systems will manage the STEMI plan implementation.

The goal of the STEMI System is to provide optimal medical care to all STEMI patients throughout the continuum of care including prevention, prehospital care, acute care, and rehabilitation. The integration of all hospitals into the system is referred to as an *inclusive* STEMI system. By providing a comprehensive approach to STEMI care, geographical or geopolitical barriers are minimized, and morbidity and mortality are reduced. Inclusive STEMI systems address the needs of all STEMI victims and identify the roles of the institutions that serve them. The concept of an inclusive system applies to both rural and urban settings and strives to match each hospital's resources with the needs of the STEMI patient.

In rural states like Mississippi, unique logistical problems are present including long distances, difficult access, adverse weather conditions, and sparse population densities. The challenge in designing a STEMI system in rural areas is to be able to assure that each facility understands their role in the system and provides the level of specialized care within its capacity with referral capabilities built into the system for PCI services.

The 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 the system are the pre-hospital providers and individual hospital organizations.

The system function involves the implementation of the STEMI EMS Triage and Destination Guideline and Mississippi EMS STEMI Model Treatment Protocol. Based upon need, modifications and additions may be recommended by the STEMI and EMS Advisory Councils. Hospitals participating in the system and receiving STEMI patients will have organized response systems including:

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

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 STEMI System activities and through the individual hospital QI programs.

System design includes integration of the essential components of a STEMI System; prehospital triage and identification of STEMI patients, medical control and direction, facility resources and identification, data collection and evaluation, public information and education, systems cost and funding. Each component is a vital link in the effectiveness of the overall system in reducing premature death and disability from STEMI events.

Goals

- Maintain the integration of all of the essential components of the Mississippi STEMI Care System.
- Collaborate with the Mississippi State EMS System to maintain integration with the State STEMI System of Care.
- The committee will investigate and consider new technological advances that can impact STEMI outcomes, especially those that improve time to therapy and survival.

Hospital Resources

The American College of Cardiologists and the American Heart Association have adopted guidelines for the categorization of facilities providing care to the STEMI patients (Jacobs et al., 2021). Mississippi's STEMI System of Care Plan closely follows these guidelines which stress the importance of having available resources ready to administer to the needs of the patient in a timely manner and to the extraordinary commitment of hospital resources and personnel. One of the most important components of STEMI system design is the rationalization of STEMI facilities and the integration of STEMI receiving and STEMI referral Centers into the EMS system. It is essential to

take into consideration the spectrum of care for all STEMI patients and the ability of each facility to provide treatment and care for these patients.

The most widely used guidelines for STEMI center designation are those developed by the ACC/AHA. These guidelines have been reviewed and adopted to reflect specific nuances to Mississippi. These guidelines are set to recognize hospitals that meet the criteria set below:

STEMI Receiving Center:

A hospital with the ability to provide 24/7/365 percutaneous coronary intervention (PCI) and provide leadership and complete care for every aspect of STEMI from prevention to rehabilitation. These centers strive to meet an overall arrival-to-PCI (device time) within ninety (90) minutes but strive for sixty (60) minutes or less and within thirty (30) minutes for transferred patients with STEMI (Jacobs et al., 2021).

- All STEMI receiving centers may be categorized into two recommended levels of care:
 - A Level I STEMI Receiving Hospital provides complex heart attack care that includes on-site CV surgical Capability
 - A Level II STEMI Receiving Hospital Center performs PCIs without onsite CV Surgical capability

STEMI Referral Center:

An acute care hospital with the commitment, resources, and specialty training necessary to diagnose and provide initial care and can administer thrombolytics 24/7/365. These centers should have a planned reperfusion strategy in place (either fibrinolytic administration or transfer for PCI) (Jacobs et al., 2021).

- All STEMI referral centers are categorized as Level III centers. The centers may also have either received certification as an AHA/Joint Commission Acute Heart Attack Ready Center, the American College of Cardiology (ACC) Chest Pain Center, or an equivalent certification by a nationally recognized certifying organization identified by the department.

STEMI-referring hospitals and STEMI-receiving centers should have a transfer plan in place, including a) a one-call transfer process, b) automatic acceptance of all STEMI patients that meet EKG criteria for STEMI regardless of bed availability, c) treatment algorithms, and d) transfer processes (primary and backup). A 9-1-1 call system should be used for requesting interhospital transfers (Jacobs et al., 2021)

Each hospital wishing to be designated as a STEMI receiving center or a STEMI referral center must submit a written application to the Office of EMS and Acute Care Systems certifying how they meet each of the requirements for their level of designation. Applications will be presented to the STEMI Advisory Committee, or approved process, for appropriate designation

recommendations. STEMI Advisory recommendations will be presented to the State Health Officer who will issue designations for a three-year period once approved.

Goals

- Assure that all designated STEMI receiving, and STEMI referral PCI centers continue to maintain the highest level of standards.
- Assist with the provision of continuing education in the area of Acute Coronary Syndrome care.

Performance Improvement

The Mississippi STEMI System of Care Plan is a dynamic plan and, as such, will require continuous monitoring and modification. The MSDH in conjunction with the advice of the Mississippi STEMI Advisory Council will work to make the system more efficient and responsive to the needs of STEMI patients.

The PI program will be system wide. Every participating organization or facility is required to participate in the system PI process. The appropriateness, quality, and quantity of all activities of the STEMI system must be continuously evaluated.

The STEMI PI Committee will be responsible for the PI oversight of the STEMI System.

Goals

- Establish and maintain Statewide data through the nationally recognized heart attack registry.
- Provide technical assistance to Regions and Hospitals for the nationally recognized heart attack registry.
- Provide aggregate STEMI data feedback to STEMI regions and STEMI receiving and referral PCI centers.
- Provide STEMI related data to the STEMI Performance Improvement Committee to further the development of STEMI system standards and education.

Administrative Components

The Mississippi State Department of Health Office of EMS and Acute Care Systems has the responsibility for coordinating the STEMI system of care and the pre-hospital EMS system. The Office of EMS and Acute Care System will manage the STEMI plan implementation.

The Office of EMS and Acute Care Systems is responsible for the administration of the statewide STEMI System including policy development, planning, program and policy implementation, promulgation and coordination of regulatory efforts, and general administrative activities necessary to oversee the STEMI system.

The Office of EMS and Acute Care Systems is responsible for providing staff assistance to the STEMI Advisory Council that assists the Office in the development of statewide policies and protocols.

Goal

- Maintain necessary resources to provide needed assistance for STEMI Regions, receiving centers, referral centers, EMS, public awareness and community education throughout Mississippi.

Finance

The STEMI System received funding during the 2024 legislative session with a line-item appropriation that included funding to support the STEMI, Stroke, and Sepsis Systems of Care from state general, healthcare expendable and Tobacco Trust funds.

Goal

- Maintain funding to support the activities provided in the STEMI System of Care Plan.

Public Awareness and Community Education

It is recognized that for STEMI patients, major delays exist from patient symptom onset to presentation for medical care. It is also recognized that the 9-1-1 system to access the EMS system is significantly under-utilized by STEMI patients. Unfortunately, only around 57% of STEMI patients are transported to the hospital by ambulance in Mississippi (CPMI registry, 2023). A statewide public awareness campaign about the importance of early recognition of heart attack signs and symptoms and the importance of the early activation of the EMS system will be an integral part of the STEMI System of Care. In part, this awareness campaign should help prepare the next generation of Mississippians by including a CPR program for public and private high schools in Mississippi.

Goals

- Encourage physicians to pursue a leadership role in community education, promoting early recognition of heart attack symptoms and the need to call 9-1-1 as quickly as possible after the onset of symptoms.
- Assist the STEMI regions with the development of clinical and public STEMI and cardiovascular health education programs.
- Assure that there are appropriate public awareness programs in the area of cardiovascular disease prevention.

Pre-Hospital Care

EMS units are an integral part of the STEMI System. All EMTs, paramedics, and on-line and off-line medical control physicians need to have a basic knowledge and awareness of the STEMI System Plan elements and system function. This specifically refers to the alert criteria (identification of a STEMI) and communication procedures.

Pre-hospital care is provided by private, public, and hospital-based EMS agencies. Each of these agencies has its own medical director and medical control system. While there are statewide requirements for these agencies and a model Mississippi STEMI treatment protocol, specific EMS treatment protocols may vary from provider to provider. EMS regulations require licensed EMS agency's Medical Control Program to comply with this System of Care Plan. The STEMI EMS Triage and Destination Guideline is designed to deliver STEMI patients to the most appropriate facility, regardless of the nearest facility or the affiliation of the ambulance service. This guideline is continuously reviewed to assure STEMI patients have access to the most appropriate care.

Each STEMI Region is responsible for providing education programs for the prehospital care providers. This education will stress regional protocols appropriate to the level of care being provided; recognition of the symptoms of a potential STEMI in the field; and performing and interpreting 12-lead ECG. Prehospital care providers will participate in the STEMI system evaluation and performance improvement programs.

Goals

- Revise and adjust the prehospital care regulations to assure their integration within the STEMI system.
- Provide assistance to the STEMI Regions in providing necessary STEMI System of Care education to the prehospital care providers.
- Assist with the interregional coordination of prehospital care providers.

Definitive Care

Each STEMI receiving center must have a cardiac interventionist and emergency physician responsible for oversight of the STEMI program. The responsibility includes:

- a. Maintaining compliance with state and federal regulations.
- b. Oversight responsibility for the hospital STEMI QI Program including data collection and reporting.

Mississippi has 111 hospitals, with 4 satellite locations, of which 96 are considered acute care facilities, critical access hospitals, or rural emergency hospitals with emergency departments, and hospitals listed on MSDH website approved to provide PCI services.

Hospitals interested in being designated must submit an application to the Office of EMS and Acute Care Systems describing, in detail, how they meet each of the requirements within their requested designation level and certifying that they meet designation standards.

Designation Levels

- STEMI Receiving Center:** A hospital with the ability to provide 24/7/365 percutaneous coronary intervention (PCI) and provide leadership and complete care for every aspect of STEMI from prevention to rehabilitation. STEMI receiving centers should receive STEMI patients regardless of bed availability and capacity. All STEMI receiving centers may be categorized into two recommended levels of care.
- A Level I STEMI receiving hospital provides complex heart attack care that includes on-site CV surgical capability.
 - A Level II STEMI receiving hospital performs PCIs without onsite CV surgical capability.

- STEMI Referral Center:** An acute care hospital with the commitment, resources and specialty training necessary to diagnose and provide initial care and can administer thrombolytics 24/7/365. These centers should have a planned reperfusion strategy in place (either fibrinolytic administration or transfer for PCI). (Jacobs et al., 2021).

It has been long recognized that all hospitals are not capable of providing percutaneous coronary intervention (PCI) treatment. Mississippi, following national patient care standards set forth by the American College of Cardiologists and the American Heart Association, has developed a hospital classification scheme as described above (Jacobs et al., 2021). Based on this classification scheme, patients may be transferred from the field or a facility to a facility based on that individual's medical needs and the level of designation for each facility. These transfers may seem, and may in fact be, contrary to the transfer concept set forth by the Federal Government in its EMTALA Regulations. The triage and transfer guidelines in Mississippi are based on the concept of getting the right patient to the right hospital in the shortest period of time. In order to do this some hospitals may be completely bypassed in favor of a more distant but more medically capable hospital.

The current system is regionally based and is built on an “inclusive model” which allows all hospitals to participate in the STEMI system of care. The goal of the inclusive model is to assure that all STEMI patients receive optimal care, given available resources, and that the needs and location of the patient are matched with the resources of the system.

Each designated facility will be required, based on their level of designation, to have in place patient transfer protocols that assure rapid transfer to a STEMI receiving facility. These transfer guidelines will include suggested patient transfer guidelines. Interhospital request time by the STEMI referral hospital to EMS arrival time should be within fifteen (15) minutes and STEMI

receiving centers should be able to rapidly treat the transfer STEMI patients. All patients being transferred from one facility to another will be subjected to a local and regional review to assure medically appropriate transfers.

Rehabilitation is an important component of STEMI patient care. It is a well-established fact that STEMI patients recover more rapidly and completely when rehabilitation is instituted early in the acute care phase. All designated STEMI receiving facilities must have a plan in place, including transfer guidelines, for the early institution of rehabilitation.

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. A link between the prehospital providers and STEMI receiving and STEMI referral centers 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.
- c. Collection of uniform system-wide data for QI activities.

Goals

- Encourage all Mississippi hospitals to participate in the STEMI system of care.
- Provide additional assistance to hospitals that cannot meet certain STEMI receiving or referral center standards.
- Encourage and assist hospitals that wish to upgrade their STEMI center status.

Evaluation

The Mississippi State STEMI Care System is a dynamic system initially based on national standards modified to meet the needs of Mississippi. In order to assure patients, have access to and are transported to the most appropriate facility, data will be collected and reviewed on all STEMI patients.

The Office of EMS and Acute Care Systems maintains the state aggregate data from a nationally recognized heart attack registry. There are four objectives of maintaining the registry: performance improvement, hospital operations, prevention, and medical research. Of the four, performance improvement is the primary reason for maintaining the registry. When utilized appropriately, performance improvement can be done in a much more efficient manner than if done manually. Secondly, the registry can help in managing resource utilization through summaries, etc. The registry can also be used to help target specific prevention programs to reduce cardiovascular disease in Mississippi. Finally, the information can be used in clinical research by all designated facilities capturing standardized data.

The nationally recognized heart attack registry system is designed primarily to collect data on STEMI patients. It is also designed to identify system issues, such as over and under-triage. Data collection will begin with systems and field data and continue through patient discharge/autopsy.

Performance improvement is a vital part of the STEMI System. It is used to document the continuing proper function of the system and evaluation of that function to implement improvements in system operation and STEMI patient management. In a STEMI system, patients have virtually no time to make specific choices regarding acute and critical medical care. Therefore, the system has a moral obligation to perform evaluation functions to assure that the highest level of care is being provided and that improvements are implemented whenever possible in a timely manner.

The PI program will be system wide. Every participating organization or facility is required to participate in the System PI process. The appropriateness, quality, and quantity of all activities of the STEMI system must be continuously evaluated.

- The STEMI PI committee will be responsible for the PI oversight of the STEMI System.
 - Members of the STEMI PI committee will be appointed by the State Health Officer for a term of three years.
 - Member representation on the STEMI PI committee includes:
 - One interventional cardiologist practicing PCI from each of the three regions.
 - One emergency medicine physician practicing at a STEMI receiving center from each of the three regions.
 - The State EMS Medical Director or his physician designee.
 - The STEMI PI will be co-chaired by a cardiology physician and a vice-chair cardiologist or emergency medicine physician of the committee as determined annually by a majority of the committee.
- Specific audit filters will be established by the STEMI PI committee.

In general, the following processes should be performed by each agency or organization. The results of these reviews will be reported to the STEMI PI committee.

- Each organization assigns a PI person to oversee the process
- Standards established
- Determine audit filters
- Collect data
- Evaluate data
- Determine PI issues present
- Develop corrective action plan (CAP)
- Re-evaluate to document results/effectiveness of

CAP Specific items for evaluation:

- Pre-hospital:
 - Accuracy of patient assessment and 12-lead ECG interpretation
 - Protocol adherence
 - Procedures initiated/completed
 - Medical control interaction

- o Transport mode (air/ground)
- o Record/documentation
- o Inter-facility care/transport
- Hospital:
 - o Protocol adherence
 - o Outcome review
 - Complications
 - Deaths
 - o Achievement of time-sensitive goals, i.e., first medical contact, door to door to reperfusion.
 - o Adherence to designation level criteria

Data will be reviewed and analyzed at no less than two separate levels. Primary patient care data will be reviewed at each facility by its multidisciplinary committee. These committees will utilize nationally accepted patient review criteria and will also review the prehospital care of STEMI patients.

The final level of data review will take place at the state level. Statewide data will be used for the review of statewide criteria and epidemiological purposes. The Statewide Education/Prevention program will be based on this data.

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