#573

Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER)

Report to
the Mississippi Legislature

Improving Mississippi's Trauma Care System: Opportunities and Limitations

Between 2000 and 2010, the ratio of trauma deaths versus traumatic injuries in Mississippi improved from 5.1% to 2.0%. While many factors have arguably played a role in controlling the number of trauma deaths, the Mississippi Trauma Care System has played a role by slowing the decline in the number of trauma centers and by improving the prehospital methods for routing a trauma patient to the most appropriate trauma center.

Based on recommendations from the 2007 Trauma Care Task Force, the Board of Health has changed the way trauma care funding is distributed. Instead of reimbursing hospitals and physicians for uncompensated trauma care costs based on claims submitted, the current method distributes funds based on a trauma center's designation and the number and severity of trauma patients treated. The current method also includes emergency medical service providers in the fund distribution and has expanded the pool of physicians eligible to receive funds.

To ensure that the state's trauma centers and emergency medical services providers receive the majority of available funds, the Department of Health's portion of the Trauma Care Systems Fund for administrative expenses must be kept to a reasonable limit while ensuring adequate support of the trauma care system. From FY 2010 through FY 2012, the department's administrative expenditures represented from 3.5% to 4.8% of the amounts available for distribution from the Trauma Care Systems Fund.

While Mississippi's trauma care system has opportunities for improvement in its design, external environmental factors pose significant fiscal and logistical challenges, including:

- unequal access to and growth of Level I-III trauma centers;
- fiscal challenges resulting from high rates of uninsured, Medicare, and Medicaid patients, as well as overworked emergency rooms;
- hospitals' choices regarding their level of participation in the system and no provision to develop new trauma centers or upgrade trauma centers; and,
- a level of funding that is not sufficient to cover trauma centers' uncompensated trauma care costs and that does not specifically provide for the "golden hour" (i. e., the first sixty minutes after a traumatic injury) of trauma care.

August 6, 2013

PEER: The Mississippi Legislature's Oversight Agency

The Mississippi Legislature created the Joint Legislative Committee on Performance Evaluation and Expenditure Review (PEER Committee) by statute in 1973. A joint committee, the PEER Committee is composed of seven members of the House of Representatives appointed by the Speaker and seven members of the Senate appointed by the Lieutenant Governor. Appointments are made for four-year terms, with one Senator and one Representative appointed from each of the U. S. Congressional Districts and three at-large members appointed from each house. Committee officers are elected by the membership, with officers alternating annually between the two houses. All Committee actions by statute require a majority vote of four Representatives and four Senators voting in the affirmative.

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The Committee assigns top priority to written requests from individual legislators and legislative committees. The Committee also considers PEER staff proposals and written requests from state officials and others.

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August 6, 2013

Honorable Phil Bryant, Governor
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On August 6, 2013, the PEER Committee authorized release of the report entitled **Improving Mississippi's Trauma Care System: Opportunities and Limitations**.

Representative Ray Rogers, Chair

This report does not recommend increased funding or additional staff.

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Improving Mississippi's Trauma Care System: Opportunities and Limitations

Executive Summary

Introduction

In January of this year, the PEER Committee released the report *A Descriptive Review of the Mississippi Trauma Care Systems Fund* (PEER Report #568). In that report, PEER described how the Trauma Care Systems Fund receives and distributes its funding.

Subsequent to that report's release, the Committee conducted additional field work regarding the statewide trauma care system to determine what opportunities exist for improvement, as well as the limiting factors. This report is intended to be a companion piece to Report #568.

Background

A *traumatic* injury requires surgical and other medical specialists to consult, observe, or perform surgery in order to optimize recovery. A *trauma system* is an organized, coordinated effort within a defined geographic area that is designed to provide a continuum of intensive medical services beginning with a traumatic injury and continuing through hospital discharge.

As discussed in PEER Report #568, MISS. CODE ANN. Section 41-59-5 (1972) requires every Mississippi licensed acute care facility to participate in the statewide trauma care system. Facilities are designated as Level I, Level II, Level III, or Level IV trauma centers based on specific criteria, including the services each facility offers, defined in *Mississippi Trauma Care System Regulations*.

As of February 5, 2013, seventy-nine in-state hospitals, one in-state burn center, and three out-of-state hospitals were participating in the Mississippi trauma care system.[1] A trauma system also involves, at varying degrees, the coordination of trauma care delivery among trauma centers and prehospital providers with state and local governments and other healthcare resources. Other participants in the Mississippi trauma care system include:

[1] University of South Alabama Hospital in Mobile, AL, and the Regional Medical Center at Memphis in Memphis, TN, provide Level I care for transferred patients. Le Bonheur Children's Hospital in Memphis, TN, is a tertiary pediatric trauma center.

- the state's Department of Health;
- the Mississippi Trauma Advisory Committee;
- the State Trauma Performance Improvement Subcommittee; and,
- seven designated trauma care regions and their respective boards of directors.

Conclusions

Has the Mississippi Trauma Care System accomplished what it was created to accomplish?

The Legislature created the state's trauma care system to "reduce death and disability resulting from traumatic injury." Between 2000 and 2010, the ratio of trauma deaths versus traumatic injuries in Mississippi improved from 5.1% to 2.0%. While many factors have arguably played a role in controlling the number of trauma deaths, the Mississippi Trauma Care System has played a role by slowing the decline in the number of trauma centers and by improving the prehospital methods for routing a trauma patient to the most appropriate trauma center.

Who developed the previous and current methods for distributing the Trauma Care Systems Fund and why?

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed both the previous and current methods for distributing the Trauma Care Systems Fund. Instead of reimbursing hospitals and physicians for uncompensated trauma care costs based on claims submitted, as was the case under the previous distribution method, the current method distributes funds based on the trauma center's designation and the number and severity of trauma patients treated. The current method also includes EMS providers in the funds distribution and has expanded the pool of physicians eligible to receive funds.

How does the Department of Health spend its portion of the Trauma Care Systems Fund to support the operations of the Mississippi Trauma Care System?

Because the state's trauma care system is designed to "reduce the death and disability resulting from traumatic injury," it is important that the state's trauma centers and emergency medical services providers receive the majority of available funds. Therefore, the Department of Health's portion of the Trauma Care Systems Fund for administrative expenses must be kept to a reasonable limit while ensuring adequate support of the trauma care system. The department spent approximately $2.9 million

from the fund for administration during FY 2010 through FY 2012, including approximately $1.1 million in salaries and fringe benefits for departmental employees and contract workers assigned in whole or in part to the trauma care system.

What are the opportunities and limitations of Mississippi's trauma care system and the current method of distributing the Trauma Care Systems Fund?

While the Mississippi Trauma Care System has opportunities for improvement in its design, external environmental factors pose significant fiscal and logistical challenges and system design limits options for developing or upgrading trauma centers, including:

- access to and growth of Level I-III trauma centers is not equal throughout the state;
- because of high rates of uninsured patients and Medicare or Medicaid patients, as well as overworked emergency rooms, the trauma system faces significant fiscal challenges; and,
- a hospital's choice regarding its level of participation in the trauma care system is made independently of the Department of Health and the system is not designed to develop new trauma centers or upgrade trauma centers.

Further, while the current level of funding provides flexibility to the trauma centers to target trauma needs, the current level is not sufficient to cover trauma centers' uncompensated trauma care costs or to improve trauma center designation and does not specifically provide for the "golden hour"[2] of trauma care.

Recommendations

1. The Mississippi Trauma Advisory Committee (MTAC) and the Department of Health should analyze trauma center coverage and emergency medical services coverage in the state. Based on this analysis, MTAC and the Department of Health should develop strategies to target coverage gaps in the trauma care system and a timeline for improving such coverage.
2. The Department of Health should periodically determine Mississippi's total cost of trauma care, specifically that portion that is considered to be

[2] The *golden hour* is the first sixty minutes after a traumatic injury. It is widely believed that a serious injury victim who reaches an emergency room within those sixty minutes has a greater chance of survival if he or she receives definitive trauma care within the first hour. However, less than thirty percent of the continental United States is within one hour of a Level I or Level II trauma center.

uncompensated trauma care. The department should also develop and submit to the Legislature alternatives for funding to address more sufficiently the state's uncompensated trauma care costs.

3. MTAC and the Department of Health should continue their current efforts of analyzing the current Trauma Care Systems Fund distribution formula, with a goal of providing additional funding to Level IV trauma centers.

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Improving Mississippi's Trauma Care System: Opportunities and Limitations

Introduction

Authority

In response to a legislative request, the PEER Committee reviewed:

- the Mississippi Trauma Care System's ability to fulfill its statutory purpose; and,
- the origin and development of the method for distributing money from the Trauma Care Systems Fund to help support the statewide trauma care system.

The Committee acted in accordance with MISS. CODE ANN. Section 5-3-51 et seq.

Problem Statement

In January of this year, the PEER Committee released the report *A Descriptive Review of the Mississippi Trauma Care Systems Fund* (PEER Report #568). In that report, PEER described how the Trauma Care Systems Fund receives and distributes its funding. (See Appendix A, page 57, for the executive summary of that report.)

Subsequent to that report's release, the Committee conducted additional field work regarding the statewide trauma care system to determine what opportunities exist for improvement, as well as the limiting factors. This report is intended to be a companion piece to Report #568.

Scope and Purpose

To identify the opportunities and limitations of the statewide trauma care system, this report addresses the following:

- Has the Mississippi Trauma Care System accomplished what it was created to accomplish?

- Who developed the previous and current methods for distributing the Trauma Care Systems Fund and why?
- How does the Department of Health spend its portion of the Trauma Care Systems Fund to support the operations of the Mississippi Trauma Care System?
- What are the opportunities and limitations of Mississippi's trauma care system and the current method of distributing the Trauma Care Systems Fund?

Method

During the course of this review, PEER:

- reviewed sections of Title 41, Chapter 59, MISSISSIPPI CODE ANNOTATED (1972), regarding the state's trauma care system and the Trauma Care Systems Fund;
- interviewed appropriate Department of Health staff;
- reviewed the origin and establishment of the Reimbursement for Uncompensated Care method and the current distribution method, including how each method attempted to distribute money from the Trauma Care Systems Fund to the trauma system;
- reviewed the Department of Health's regulations related to the trauma care system, in particular those governing the Trauma Care Systems Fund; distribution of the fund's monies; the designation process; and, the emergency medical services' delivery of trauma patients to trauma centers;
- collected and reviewed data and procedures pertaining to the delivery and arrival of patients at Level I-IV trauma centers; and,
- collected and reviewed financial information pertaining to the Trauma Care Systems Fund's expenditures (FY 2010 through FY 2012).

Background

Unintentional and violence-related injuries--such as a head injury from a motor vehicle crash or a gunshot wound from a violent crime--are the leading cause of death for Americans age 1 to 44. As a result, many victims of such injuries depend on the trauma system, which includes the prehospital and emergency medical services (EMS) system and an interconnected network of trauma centers, to be quickly transported to a nearby trauma center or emergency department.

What is Trauma?

A *traumatic* injury requires surgical and other medical specialists to consult, observe, or perform surgery in order to optimize recovery.

A *traumatic* injury requires surgical and other medical specialists to consult, observe, or perform surgery in order to optimize recovery. A physical trauma is a serious injury to the body. Blunt force trauma occurs when the body is struck with an object or force, causing concussions, lacerations, or fractures. Penetrating trauma occurs when an object pierces the skin or body, usually creating an open wound.

For inclusion in the trauma registry (see page 11), a patient's case must meet certain criteria. First, the diagnosis must meet criteria for a trauma according to the *World Health Organization's International Classification of Diseases, Ninth Revision, Clinical Modification* (ICD-9-CM). ICD-9-CM is the official system of assigning codes to diagnoses and procedures associated with hospital utilization in the United States.

Second, the case must meet any one of the following criteria:

- transferred between acute care facilities (in or out);
- admitted to critical care unit (no minimum length of stay);
- hospitalization for three or more calendar days;
- died after receiving any evaluation or treatment;
- admitted directly from the Emergency Department to the Operating Room for a major procedure, excluding

plastics or orthopedic procedures on patients that do not meet the three-day hospitalization criteria;

- triaged (per regional trauma protocols) to a trauma center by prehospital care regardless of severity; or,
- treated in the Emergency Department by the trauma team regardless of severity of injury.

Trauma patients make up only a portion of the patients using emergency medical services, because both sick patients[3] and injured patients use emergency room services. Prehospital trauma care is also affected by the care of both emergency-related sick patients as well as non-emergency related transfer patients. Transfer patients include patients who may require non-emergency transport by ambulance such as an immobile nursing home client who utilizes an ambulance to be transported to a kidney dialysis appointment and back to the nursing home.

What is a Trauma System?

A *trauma system* is an organized, coordinated effort within a defined geographic area that is designed to provide a continuum of intensive medical services beginning with a traumatic injury and continuing through hospital discharge.

A *trauma system* is an organized, coordinated effort within a defined geographic area that is designed to provide a continuum of intensive medical services that begins immediately following a traumatic injury and continues through hospital discharge. A trauma system is comprised of two distinct sectors: the prehospital sector and the hospital sector.

The prehospital sector includes the emergency medical services system comprised of EMS, ambulances, air support, and medical control. EMS is an integral part of a trauma system that provides rapid response to emergencies, prehospital emergency care, and transportation to an appropriate medical facility.

The hospital sector is comprised of an interconnected network of trauma centers, each with varying capabilities. Within trauma centers, patients are stabilized, diagnosed, and provided with time-critical medical or surgical interventions.

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[3] Sick patients might include those with strokes, respiratory emergencies, cardiovascular emergencies, diabetic emergencies, poisoning/overdose emergencies, allergic reactions, influenza, or pneumonia.

As discussed in PEER Report #568, MISS. CODE ANN. Section 41-59-5 (1972) requires every Mississippi licensed acute care facility to participate in the statewide trauma care system. Facilities are designated as Level I, Level II, Level III, or Level IV trauma centers based on specific criteria, including the services each facility offers, defined in *Mississippi Trauma Care System Regulations*.[4] Exhibit 1, below, lists the services required by the regulations for each level of designation of trauma centers.

Exhibit 1: Required Services Trauma Centers Must Offer, by Level

	Level I	Level II	Level III	Level IV[#]
Emergency Medicine	X	X	X	X
General Surgery	X	X	X	
Orthopedic Surgery	X	X	X	
Anesthesia	X	X	X	
Post Anesthesia Care Unit	X	X	X	
Intensive Care Unit	X	X	X	
Neurological Surgery	X	X		
Surgical Residency Program	X			

According to Mississippi Trauma Care System Regulations Rule 1.3.12, for the purposes of the annual assessment, all clinical services cited above must be available at the trauma center twenty-four hours per day, seven days per week to be considered.

[#]According to the 2010 Mississippi Trauma Care System Plan, Level IV trauma centers are acute care facilities with a commitment to the resuscitation of the trauma patient and written transfer protocols in place to assure that those patients who require a higher level of care are appropriately transferred.

SOURCE: *Mississippi Trauma Care System Regulations*.

[4] *Mississippi Trauma Care System Regulations* for categorizing Level I through Level IV trauma centers closely follow published guidelines of The American College of Surgeons, Committee on Trauma and the American College of Emergency Physicians for the categorization of facilities providing care to trauma victims.

As of February 5, 2013, seventy-nine in-state hospitals, one in-state burn center, and three out-of-state hospitals were participating in the Mississippi trauma care system.[5] Exhibit 2, below, shows the number and level of trauma centers in each trauma care region. Appendix B, page 62, lists health care facilities in Mississippi's trauma care system and their participation levels. Appendix C, page 65, lists Mississippi hospitals categorized as non-designated and non-participating in the state's trauma care system.

Exhibit 2: Trauma Care Regions and Number of Trauma Centers in Each Region, as of February 5, 2013*

Trauma Care Region	Number of Level I Trauma Centers**	Number of Level II Trauma Centers	Number of Level III Trauma Centers	Number of Level IV Trauma Centers
Central	1	0	2	12
Coastal	1	2	3	2
Delta	2	0	2	11
East Central	0	0	1	7
North	0	1	4	11
Southeast	0	1	2	10
Southwest	0	0	1	6

*The Mississippi Trauma Care System also includes the Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital in Brandon, MS. This is the lone burn center in Mississippi and is affiliated with the Joseph M. Still Burn Center, Inc., in Augusta, Georgia, the largest burn care facility in the United States.

**The following trauma centers are out-of-state participants in the Mississippi Trauma Care System: Le Bonheur Children's Hospital in Memphis, TN, a tertiary pediatric trauma center; University of South Alabama Medical Center in Mobile, AL; and Regional Medical Center in Memphis, TN.

SOURCE: Mississippi Department of Health.

A trauma system also involves, at varying degrees, the coordination of trauma care delivery among trauma centers and prehospital providers with state and local governments and other healthcare resources. As discussed PEER Report #568, participants in the Mississippi trauma care system include:

[5] University of South Alabama Hospital in Mobile, AL, and the Regional Medical Center at Memphis in Memphis, TN, provide Level I care for transferred patients. Le Bonheur Children's Hospital in Memphis, TN, is a tertiary pediatric trauma center.

- the state's Department of Health;
- the Mississippi Trauma Advisory Committee;
- the State Trauma Performance Improvement Subcommittee; and,
- seven designated trauma care regions and their respective boards of directors.

See PEER Report #568 for additional information on the design of the trauma system.

Has the Mississippi Trauma Care System accomplished what it was created to accomplish?

The Legislature created the state's trauma care system to "reduce death and disability resulting from traumatic injury." Between 2000 and 2010, the ratio of trauma deaths versus traumatic injuries in Mississippi improved from 5.1% to 2.0%. While many factors have arguably played a role in controlling the number of trauma deaths, the Mississippi Trauma Care System has played a role by slowing the decline in the number of trauma centers and by improving the prehospital methods for routing a trauma patient to the most appropriate trauma center.

This chapter will address the following:

- What was the Mississippi Trauma Care System created to do?
- What are the key components of a best practices model for a statewide trauma care system and how does Mississippi's system compare to that model?
- What has the Mississippi Trauma Care System accomplished since its beginnings in 1991?

What was the Mississippi Trauma Care System created to do?

The Legislature created the state's trauma care system to "reduce death and disability resulting from traumatic injury" and made the Department of Health responsible for developing the system and disbursing the funds to participants in the system.

MISS. CODE ANN. Section 41-59-5 (1972) created the state's trauma care system to "reduce death and disability resulting from traumatic injury." To accomplish such, the same CODE section established the Mississippi State Department of Health (MSDH) as the lead agency to "develop a uniform nonfragmented inclusive statewide trauma care system that provides excellent patient care" and to receive and disburse the funds from the Mississippi Trauma Care System Fund according to trauma care system regulations.

What are the key components of a best practices model for a statewide trauma care system and how does Mississippi's system compare to that model?

The six key components of a model trauma system are: (1) a trauma center designation process; (2) the existence of trauma or EMS advisory groups; (3) use of a trauma registry; (4) updated field triage guidelines; (5) an emergency preparedness plan and a mass casualty incident plan; and, (6) a funding source. Mississippi's trauma system has all components except for a statewide emergency preparedness plan, opting instead to require each hospital to develop a local emergency operation response plan.

Best Practices Model for a Statewide Trauma Care System

A trauma system should provide a continuum of intensive medical services that begins immediately following a traumatic injury and continues through hospital discharge. Six components play a key role in supporting a model trauma system.

Trauma systems vary by state. However, according to the National Conference of State Legislatures' report *The Right Patient, The Right Place, The Right Time,* which was a review of trauma and emergency medical services policy in the states, a model trauma system has six key components:

- a trauma center designation process;
- the existence of trauma or EMS advisory groups;
- use of a trauma registry;
- updated field triage guidelines;
- an emergency preparedness plan and a mass casualty incident plan; and,
- a funding source.

The following sections discuss whether Mississippi's trauma care system meets the criteria for this best practices model.

Trauma Center Designation Process

"Designation" is the process by which hospitals are classified by the level of trauma care they can provide. Mississippi is one of five states to designate trauma centers through departmental administrative or regulatory code.

Designation is the process by which hospitals are classified by the level of trauma care they can provide. Because trauma centers vary in their capacity to treat severely injured patients, trauma center levels should be

established through a state-based designation process to ensure that trauma care facilities are equipped to serve patients with appropriate levels of care. As of September 2012, thirty-six states had given a state agency the explicit legal authority to designate trauma centers. Five additional states, including Mississippi, designate trauma centers through their administrative or regulatory code (in Mississippi, through the Department of Health). The American College of Surgeons, Committee on Trauma (ACS/COT) and the American College of Emergency Physicians (ACEP) have both published guidelines for the categorization of facilities during the designation process.

In Mississippi, the State Health Officer has final designation authority over trauma centers. *Mississippi Trauma Care System Regulations* for categorizing Level I through Level IV trauma centers closely follow the published guidelines of ACS/COT and ACEP for the categorization of facilities providing care to trauma victims. Exhibit 1, page 5, lists the services required by the regulations for each level of designation of trauma centers.

Existence of Trauma or EMS Advisory Groups

The Mississippi Trauma Advisory Committee acts as the advisory body for trauma care system development in Mississippi and provides technical support to the Department of Health regarding system design, trauma standards, data collection and evaluation, quality improvement, funding, and evaluation.

To help guide trauma and emergency medical service activities, legislators in the states have created advisory groups tasked with advising state agencies, the legislatures, or the governors about recommended changes for the state's trauma system. The advisory groups may be required to include members of the trauma and EMS community, board-certified trauma and emergency medical physicians, representatives of prehospital service providers, and representatives from the state agency that manages the trauma system. The advisory groups use data collected through the trauma registry to identify opportunities to improve performance.

In Mississippi, the Mississippi Trauma Advisory Committee acts as the advisory body for trauma care system development and provides technical support to the Department of Health regarding system design, trauma standards, data collection and evaluation, quality improvement, funding, and evaluation. The committee has nineteen members representing various groups, including each trauma care region, both private and public EMS, a trauma consumer, and a representative of county/municipal government.

Use of a Trauma Registry

The Mississippi Department of Health's regulations require that every hospital having an organized emergency service or department submit data to the trauma registry. Mississippi is one of nineteen states to require that the trauma registry be integrated with prehospital reporting data.

As of September 2012, statutes in forty states, including Mississippi, had established a statewide trauma registry. Each state's trauma registry differs in the type and scope of information collected, but data collected may include data about the incidence, severity, causes, costs, and results of trauma. Examples of data collected by Mississippi's trauma registry include trauma patient demographic information and injury information (including location and the use of protective devices such as seat belts by the trauma patient). By tracking the data and improving trauma registry measuring capabilities, state trauma systems can use the data to improve patient care in the future or to determine preventive measures to reduce trauma incidences or severity, either through improved safety standards or public safety campaigns.

However, not all states with trauma registries require all trauma facilities or prehospital service providers to submit data to the registry. Twenty-four states require only trauma centers to submit data to the registry, while thirteen states require all acute care facilities to submit data to the trauma registry. The Mississippi Department of Health's regulations require every hospital having an organized emergency service or department to submit data to the trauma registry. Mississippi is also one of nineteen states to require that the trauma registry be integrated with prehospital reporting data (e. g., Did the patient arrive at the trauma center by ambulance, helicopter, transfer in, or walk-in?).

Updated Field Triage Guidelines

Recognizing the importance of transporting trauma patients to the most appropriate trauma center quickly, in 2011 Mississippi amended its Trauma Care System Regulations to include the Consolidated Trauma Activation Criteria and Destination Guidelines. These are modeled after the Guidelines for Field Triage of Injured Patients established by the Centers for Disease Control and Prevention.

As noted previously, prehospital emergency care and transport are integral components of getting a patient to the appropriate level of care needed. Although transporting all traumatic injuries to Level I trauma centers is unnecessary and uses valuable financial resources at a higher cost, a Level IV trauma center may not be capable of treating a particular trauma patient.

Thus, it is important to transport the patient to the most appropriate trauma center quickly.

The *Guidelines for Field Triage of Injured Patients*, developed by a panel convened by the Centers for Disease Control and Prevention, the American College of Surgeons, and the National Highway Traffic Safety Administration, includes best practices criteria for EMS providers to use in identifying patients who need specialized trauma center care. These guidelines help EMS personnel to estimate accurately an injury's severity to ensure that patients with the most severe injuries are taken to the appropriate level of trauma care.

In 2003, the Department of Health's Bureau of Emergency Medical Services revised EMS regulations to require ambulance services to adhere to regional trauma plan treatment and destination policies. These destination policies are designed to deliver trauma patients to the closest, most appropriate facility, regardless of the nearest facility or the affiliation of the ambulance service. Destination protocols were established by the trauma care regions' boards of directors and were reviewed to assure that trauma patients receive access to the most appropriate care based on their injuries.

In 2011, recognizing the importance of transporting trauma patients to the most appropriate trauma center quickly, the Mississippi Trauma Care System again revised and the Board of Health adopted guidelines governing prehospital response. Modeled after the *Guidelines for Field Triage of Injured Patients*, the Mississippi Trauma Care System amended regulations to include the Consolidated Trauma Activation Criteria and Destination Guidelines, as shown in Exhibit 3 on page 13.

According to these guidelines, if emergency medical service personnel designate a trauma patient as an *alpha*[6] patient or *bravo*[7] patient based on an assessment of the patient and the cause of the injuries, then the trauma patient should be transported to Level I, II, or III trauma centers as appropriate for the trauma injuries. However, if a trauma patient goes into cardiac arrest,[8] has an unsecured airway, or if EMS provider safety is a concern

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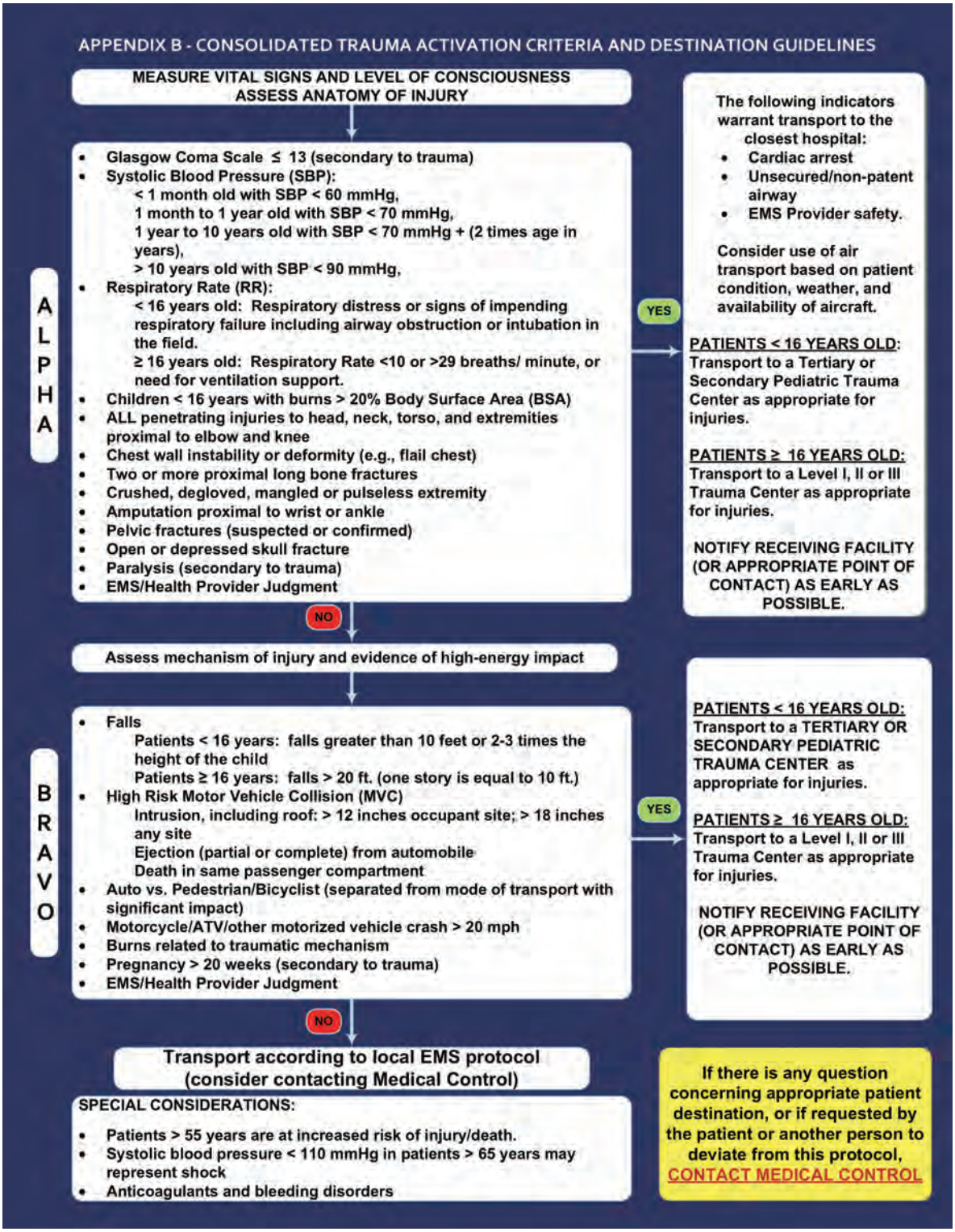
[6] A trauma patient is assigned an *alpha* designation if the measurement of a trauma patient's vital signs, level of consciousness, and an assessment of anatomy for injuries meet specified criteria (e.g., a trauma patient older than ten years with a systolic blood pressure of less than 90 mmHg or a trauma patient with an open or depressed skull fracture).

[7] A trauma patient is assigned a *bravo* designation if an assessment of mechanism of injury and evidence of high-energy impact meet specified criteria (e.g., motorcycle crash at greater than twenty miles per hour, pregnancy greater than twenty weeks [secondary to trauma], or trauma patient of age greater than or equal to sixteen years old falling from greater than twenty feet).

[8] Trauma patients may go into cardiac arrest as a result of their injuries preventing or stopping normal circulation of blood flow to their heart.

Exhibit 3: Mississippi Trauma Care System's Consolidated Trauma Activation Criteria and Destination Guidelines

The purpose of the "Consolidated Trauma Activation Criteria and Destination Guidelines" is to direct emergency medical service providers to the most appropriate trauma center for the trauma patient based on the level of care needed to stabilize and treat the patient.



SOURCE: *Mississippi Trauma Care System Regulations.* Effective August 23, 2012.

(e. g., due to weather conditions), transport to the closest hospital is warranted.

Any trauma patient not designated as an alpha or bravo patient is transported according to local or EMS protocol. If there is any question concerning appropriate patient destination, or if requested by the patient or another person to deviate from this protocol, then EMS is required to contact medical control.[9] Based on the circumstances, the licensed physician at medical control then decides where to send the patient.

Trauma Care System Involvement in Emergency Preparedness Planning

Although Mississippi has not developed a statewide emergency preparedness plan, it is one of nineteen states in which the state trauma care system has a specific role in the state's mass casualty incident plan.

Planning for and responding to public health emergencies require a coordinated effort between local, state, and national emergency services responders. The trauma care system is an integral part of any public health emergency or natural disaster and a well-functioning day-to-day trauma system can be the foundation for a well-functioning emergency medical response following a disaster or mass casualty. Developing statewide emergency management plans, such as a disaster response plan or a mass casualty event plan, enables states to identify each agency's role and responsibilities during public health emergencies.

Mississippi has not developed a statewide emergency preparedness plan. However, the Department of Health's Office of Licensure and Certification and the Centers for Medicare and Medicaid Services require each hospital to submit a Hospital Emergency Operations Plan as part of fulfilling the licensure requirement. According to the *Minimum Standards of Operation for Mississippi Hospitals*, the Department of Health's Office of Emergency Preparedness and Response must review each hospital's emergency operations plan for conformance with the *All Hazards Emergency Preparedness and Response Plan.* Particular attention must be given to critical areas of concern, which may arise during any "all hazards" emergency, whether required to evacuate or to sustain in place. The critical areas of consideration include: (1) risk assessment, (2) command structure and coordination responsibilities, (3) communications, (4) resources and

[9] *Medical control* includes the directions, advice, and professional support provided to field EMS personnel via radio or telephone communication from a centrally designated medical facility staffed by appropriate personnel operating under medical supervision.

assets, (5) safety and security, (6) staffing, (7) utilities, (8) patient management, and (9) clinical activities.

In Mississippi, individual hospitals develop mass trauma plans because of the range in capabilities of an individual hospital or region versus other regions. For example, a thirty-person bus crash in Franklin County would represent a mass trauma injury incidence in the southwest Mississippi region, since Franklin County only has one Level IV hospital and three ambulances, with the closest Level III hospital more than forty-five miles away. However, the same thirty-person bus crash in Jackson could more easily be absorbed, since the Jackson metro area has greater EMS resources, a Level I trauma center, two Level III trauma centers, and two level IV trauma centers.

Mississippi is one of nineteen states in which the state trauma system has a specific role in the state's mass casualty incident plan. Mississippi's Mass Casualty Plan is intended to assign responsibilities and actions to facilitate a response to a mass casualty incident in Mississippi resulting from natural or manmade hazards that have the potential to generate large numbers of casualties. The Mass Casualty Plan was developed to support local agencies in responding to such events. Mississippi's Mass Casualty Plan follows the National Response Plan, the National Response Framework, and the National Incident Management System as fundamental guidance for preparedness and response and is amended and updated to reflect evolving guidance and requirements.

The Department of Health also manages the Mass Fatality Plan. The purpose of the Mass Fatality Plan is to identify and describe roles and responsibilities to mitigate, prepare for, respond to, and recover from mass fatality incidents resulting from a mass trauma or mass pandemic. Like Mississippi's Mass Casualty Plan, Mississippi's Mass Fatality Plan follows the National Response Plan, the National Response Framework, and the National Incident Management System.

Funding Sources

Mississippi's Trauma Care Systems Fund receives funding solely from self-generated funds including license tag fees, all terrain vehicle/motorcycle fees, traffic violation assessments, and non-participation fees, but does not receive any appropriated state general funds or federal funds.

State trauma care systems are funded by a variety of combinations of state, local, federal, and private funding, with sources of funding varying from state to state. Trauma care systems may receive funding from fees from moving/motor vehicle violations, fees on criminal penalties, cigarette/tobacco fees, vehicle registration/driver's license fees, or other sources. Fifteen

state trauma care systems receive funding from general fund appropriations, while twenty states do not provide any funding for their trauma care systems.

Some states also apply for federal grant funds to support their trauma care systems. In 2010, forty-three states reported some type of federal funding to support trauma care system activities. Examples of federal funds received by other states used to support trauma systems include:

- Office of Rural Health Policy grants, which provide grants to states to increase access to rural healthcare, often at rural hospitals, health centers, and local clinics. Nineteen states have used these grants to fund trauma care at rural hospitals within their state.
- Section 402 Highway Safety Grant Program, which is available to states for multiple safety initiatives, including data analysis, safety education programs, and safety campaigns.
- Section 408 Traffic Safety Information System Improvement Grants, which have been used by thirteen states to develop a statewide trauma registry.
- Emergency Medical Services for Children program, which is designed to ensure that children and adolescents receive appropriate emergency medical care and to integrate pediatric emergency care into the system. Fifteen states reported using Emergency Medical Services for Children program funds to support a portion of the trauma system.

As discussed in PEER Report #568, Mississippi's Trauma Care Systems Fund receives funding solely from self-generated state funds including license tag fees, all terrain vehicle/motorcycle fees, traffic violation assessments, and non-participation fees, but does not receive any appropriated state general funds, nor does it receive federal funds.

What has the Mississippi Trauma Care System accomplished since its beginning in 1991?

Since its beginning in 1991, the Mississippi Trauma Care System has improved its prehospital methods for routing a trauma patient to the most appropriate trauma center, has experienced an increase in the number of trauma centers, and has developed a statewide performance improvement process.

As noted on page 8 of this report, the Legislature created the state's trauma care system to "reduce death and disability resulting from traumatic injury." As discussed in PEER Report #568, the number of Mississippi trauma-related deaths has remained fairly constant, increasing by

14% from 2000 to 2010 (from 440 to 504), while the number of trauma-related injuries has increased by 196% from 8,590 cases in 2000 to 25,457 cases in 2010. As a result, between 2000 and 2010, the ratio of trauma deaths versus traumatic injuries improved from 5.1% to 2.0%.

While factors such as motorcycle and bicycle helmet laws, seatbelt laws, and improved medical knowledge and technology have arguably played a role in controlling the number of trauma deaths, the Legislature created the state's trauma care system to manage and coordinate trauma care at the state, regional, and local levels and the slight increase in trauma-related deaths from 2000 to 2010 in relation to the 196% increase in trauma-related injuries seems to indicate that the system has been effective in providing trauma care and reducing the number of deaths from trauma-related injuries.

PEER believes that since the beginning of the state's trauma care system in 1991, the system has experienced the following improvements:

- improvements in prehospital care;
- increases in the number and levels of trauma centers; and,
- improvement in performance.

Prehospital Care Improvements

To improve the prehospital performance of the trauma system, the Mississippi Trauma Care System revised the trauma system regulations in 2003, then again in 2011. Prior to 2003, trauma patients could be delivered to the nearest trauma center regardless of their injuries. Following the revisions to EMS regulations in 2011, trauma patients must now be transported to the most appropriate Level I-III trauma center, as appropriate for their injuries, unless certain medical or safety exceptions permit transport to a closer Level IV trauma center.

To improve overall performance, the Mississippi Trauma Care System first needed to improve trauma system performance between the time of EMS arrival at the scene and the time of arrival of the patient at the trauma center.

As discussed on page 12, one way is to improve delivery of trauma patients to the trauma centers by delivering them to the most appropriate trauma center in an expeditious manner. In 2003, the Department of Health revised the EMS regulations to require ambulance services to adhere to regional trauma plan treatment and destination policies. These destination policies were designed to deliver trauma patients to the closest, most appropriate facility, regardless of the nearest facility or the affiliation of the ambulance service. The intent was to permit the EMS providers to bypass the nearest hospital and deliver severely or critically injured trauma patients directly to

trauma centers that could treat their injuries. Previously, EMS providers might have stopped at the nearest hospital or delivered a trauma patient to a provider within their region instead of crossing boundaries to a closer trauma center.

In 2011, recognizing the importance of transporting trauma patients to the most appropriate trauma center quickly, the Mississippi Trauma Care System further revised the guidelines governing prehospital response. Using the Consolidated Trauma Activation Criteria and Destination Guidelines, noted on page 12, the Mississippi Trauma Care System has established guidelines for assessing a trauma patient and protocols for EMS personnel to follow in delivering the trauma patient to the most appropriate facility. Specifically, the guidelines require EMS personnel to transport the trauma patients to a Level I, Level II, or Level III trauma center, as appropriate for their injuries, unless certain medical or safety exceptions permit transport to a closer Level IV trauma center, since only Level I-III trauma centers have definitive anesthesia, orthopedic, and neurosurgery care twenty-four hours a day, seven days a week.[10]

The goal of the Mississippi Trauma Care System is for all counties to have emergency medical services operations with Advanced Life Support rather than Basic Life Support.[11] However, as of March 2013, two counties still had Basic Life Support.

Increases in the Number and Levels of Trauma Centers

From 2002 to 2013, the number of trauma centers in the Mississippi Trauma Care System grew from sixty-one to eighty-two. However, the growth in the trauma system has not been equal throughout the state.

From 2002 to 2013, the number of trauma centers in the Mississippi Trauma Care System has grown from sixty-one to eighty-two, as shown in Exhibit 4 on page 20. In recent years, a Level I trauma center in Mobile has joined the Mississippi Trauma Care System to complement the Level I trauma centers serving central Mississippi (University of

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[10] Level III trauma centers do not have neurosurgery capabilities.

[11] *Advanced life support* EMS crews have one emergency medical technician (EMT) and one paramedic. *Basic life support* EMS crews have two emergency medical technicians. While both EMTs and paramedics are skilled at their respective positions, EMT training is considered the entry level for emergency medical services. EMTs' training consists of 80 to 106 hours of classroom education plus ten hours of internship and field training. EMTs can perform CPR, artificial ventilations, oxygen administration, basic airway management, spinal immobilization, vital signs and bandaging/splinting. However, EMTs cannot give injections (with the exception of epinephrine) or start intravenous lifelines. Paramedics are required to complete 1,100 hours of classroom training plus an additional 500 hours of internship and field training. In a medical emergency, paramedics can provide advanced life support care, such as endotracheal intubation (breathing tube), intravenous fluid therapy, administration of a wide array of critical care medications, and mechanical ventilation.

Mississippi Medical Center in Jackson) and north Mississippi (Regional Medical Center at Memphis). Also, the Le Bonheur Children's Hospital in Memphis, TN, has joined the system and targets critical pediatric trauma patients. Other recent examples of growth in the number of Level I-III trauma centers include the upgrades of Garden Park Medical Center in Gulfport and Central Mississippi Medical Center in Jackson, in 2012 and 2013, respectively, from Level IV to Level III.

As depicted in Exhibit 4, the number of Level III trauma centers declined from twelve in 2002 to six by 2006 but rose to fifteen by 2013.

However, the growth in the trauma system has not been equal throughout the state.

- In 2006, the Coastal Region had two Level III trauma centers and six Level IV trauma centers. By February 2013, the Coastal Region still had eight trauma centers, but instead improved to have one Level I, two Level IIs, three Level IIIs, with only two Level IV trauma centers.
- In contrast, the Southwest Region had four Level III trauma centers and three Level IV trauma centers in 2002. As of February 2013, the Southwest Region had dropped to one Level III trauma center and six Level IV trauma centers.

Development of a Statewide Performance Improvement Process

To improve trauma system performance, the Mississippi Statewide Trauma System has developed a Performance Improvement Program and an inspection process.

To improve trauma system performance, the Mississippi Statewide Trauma System has developed a two-part performance improvement process. The system utilizes performance improvement committees at the state, regional, prehospital, and trauma center levels to monitor the performance of the state's trauma care system.

The specific goals of the Mississippi Trauma Care System Performance Improvement program are to: (a) alleviate unnecessary death and disability from trauma by reducing inappropriate variation in care and improving patient care practices, and (b) promote optimal trauma care by performing ongoing cycles of evaluation of trauma care delivery and system components and implementing improvement initiatives based on optimal care practices when indicated.

Exhibit 4: Number of Trauma Centers in the Mississippi Trauma Care System* for Selected Years, by Designation and Region, 2002–2013

Trauma Centers	2002	2006	2008	Sept. 24, 2012	Feb. 5, 2013
Central					
Level I	1	1	1	1	1
Level II	0	0	0	0	0
Level III	1	0	0	1	2
Level IV	10	11	11	12	12
Coastal					
Level I	0	0	1	1	1
Level II	1	0	0	2	2
Level III	2	2	2	3	3
Level IV	2	6	6	2	2
Delta					
Level I	1	1	1	1	2
Level II	1	1	1	0	0
Level III	1	0	0	2	2
Level IV	6	13	12	11	11
East Central					
Level I	0	0	0	0	0
Level II	0	0	0	0	0
Level III	0	0	0	1	1
Level IV	6	6	7	7	7
North					
Level I	0	0	0	0	0
Level II	2	2	2	1	1
Level III	3	3	3	4	4
Level IV	11	10	10	11	11
Southeast					
Level I	0	0	0	0	0
Level II	1	1	1	1	1
Level III	1	1	1	2	2
Level IV	4	8	8	10	10
Southwest					
Level I	0	0	0	0	0
Level II	0	0	0	0	0
Level III	4	0	0	1	1
Level IV	3	6	6	6	6
Total	**61**	**72**	**73**	**80**	**82**

*The Mississippi Trauma Care System also includes the Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital in Brandon, MS. This is the lone burn center in Mississippi and is affiliated with the Joseph M. Still Burn Center, Inc., in Augusta, Georgia, the largest burn care facility in the United States.

SOURCE: Mississippi Department of Health.

To determine whether trauma care for a case was provided outside performance standards, a Performance Improvement (PI) Committee, using established performance indicators, reviews the case. (See Appendix D, page 66, for the performance indicators.) If the Performance Improvement Committee determines that the trauma care for the case was inappropriate, then the committee refers the case to the Department of Health to investigate for compliance with Mississippi Trauma System Regulations and enforcement. If the State PI Committee and subsequent PI review parties determine that there is a systemic issue during the review of outlier cases, the State PI Committee may recommend changes in the delivery of trauma system care, including modifying the *Mississippi Trauma Care System Regulations*.

The Mississippi Trauma Care System also uses the designation and inspection process to manage and improve performance. Each trauma center must provide and meet certain standards of care as part of the designation process for licensing. The department contracts for multidisciplinary teams for all on-site trauma center inspections for Level I-III trauma centers. Each Level I-III trauma center is inspected once every three years as part of the designation process. At least once during each three-year period, staff from the trauma care regions conduct site visits at Level IV trauma centers in their regions. Any hospital receiving written notification of Complete Designation with Conditions must immediately notify the trauma care region and submit to the department within thirty days a written Corrective Action Plan, including timelines for completion. The department, upon receipt, shall either approve or disapprove the plan within thirty days. The department may require a focused survey with an inspection team to review the hospital's Corrective Action Plan for complete implementation.

Who developed the previous and current methods for distributing the Trauma Care Systems Fund and why?

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed both the previous and current methods for distributing the Trauma Care Systems Fund. Instead of reimbursing hospitals and physicians for uncompensated trauma care costs based on claims submitted, as was the case under the previous distribution method, the current method distributes funds based on the trauma center's designation and the number and severity of trauma patients treated. The current method also includes EMS providers in the funds distribution and has expanded the pool of physicians eligible to receive funds.

This chapter will address the following:

- Who developed the previous method of distributing the Trauma Care Systems Fund (1998 to 2008) and how did it work?
- Why did the state change from the previous distribution method to the current method?
- Who developed the current method of distributing the Trauma Care Systems Fund and how does it work?
- What are the major differences between the previous distribution method and the current distribution method?
- Have the MTAC and the Department of Health considered revising the current distribution method?

Who developed the previous method of distributing the Trauma Care Systems Fund (1998 to 2008) and how did it work?

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, closely followed the 1997 Trauma Care Task Force's recommendations in developing the previous method for distributing the Trauma Care Systems Fund. After funding was distributed to the Department of Health and the trauma care regions for operating expenses, $10,000 was distributed to each Level IV trauma center. Of the remaining fund distribution, 70% was distributed to designated Level I-III hospitals and 30% to eligible physician specialties based on the hospitals' and physicians' applications for reimbursement for uncompensated care costs.

From 1998 to 2008, the Department of Health's regulations required the department to distribute the Trauma Care Systems Fund using the Reimbursement for Uncompensated Care method.

Entities that Developed the Reimbursement for Uncompensated Care Method

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, closely followed the 1997 Trauma Care Task Force's recommendations in developing the Reimbursement for Uncompensated Care method for distributing the Trauma Care Systems Fund.

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed the *Mississippi Trauma Care System Regulations'* Reimbursement for Uncompensated Care method for distributing the Trauma Care Systems Fund that was used as the method of distribution from 1998 until 2008. As discussed in the following section, the Reimbursement for Uncompensated Care method followed closely the recommendations of the 1997 Trauma Care Task Force.[12] However, the Board of Health had final approval authority.

How Trauma Care Systems Fund Dollars were Distributed Using the Reimbursement for Uncompensated Care Method

Under the previous distribution method, after funding was distributed to the Department of Health and the trauma care regions for operating expenses, $10,000 was distributed to each Level IV trauma center. Of the remaining Trauma Care System Fund distribution, 70% was

[12] The *Trauma Care Task Force* was established by the Mississippi Legislature in 1997 to review the status of trauma, its impact on the public's health, and report its findings to the Governor and Legislature on or before December 15, 1997.

distributed to designated Level I-III hospitals and 30% to eligible physician specialties designated by the department based on the hospitals' and physicians' applications for reimbursement for uncompensated care costs.

The Reimbursement for Uncompensated Care method was designed to reimburse trauma providers for uncompensated trauma care services for which the provider was unable to collect payment. (Under this method, the health care provider could be reimbursed only for costs incurred by patients that met the trauma registry inclusion criteria.) According to the 2005 *Mississippi Trauma Care System Regulations*:

> *. . . a claim was considered to be uncompensated if, after the provider's due diligence to collect monies due, total payment from all sources (including third-party payors) of five percent or less had been made on the total trauma-related gross charges. However, any payment received from Medicaid, precluded reimbursement from the Trauma Care Systems Fund, even if the 5% threshold had not been met.*

As discussed in PEER Report #568, during the period 1998-2008, departmental regulations required that after deducting administrative expenses associated with the state trauma care system, including regional expenses, that funding for uncompensated trauma care be divided into two categories: 70% distributed to designated hospitals and 30% distributed to eligible physician specialties designated by the department.[13] While the 1997 Trauma Care Task Force did not recommend the 70% to hospitals versus 30% to physician formula, the task force did recommend that the Legislature provide partial financial support to reimburse physicians and hospitals thirty cents on the dollar to help offset the trauma care deficit from indigent patients.

However, prior to funding being distributed to reimburse hospitals and physicians for uncompensated care, funding was distributed for the Department of Health's trauma-related administrative expenditures; $85,000 to each of the seven trauma care regions to fund operating costs; and $10,000 to each Level IV trauma center[14] for its role in stabilizing patients and operating the trauma registry.

The Level I-III trauma centers could apply for reimbursement for uncompensated care costs based on the hospital's Diagnosis Related Groups (DRG) relative

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[13] The department's 2004 regulations designated attending or admitting trauma/general surgeons, orthopedic surgeons, neurosurgeons or anesthesiologists as the physician specialties eligible to receive amounts from the Trauma Care Systems Fund.

[14] Prior to 2005, Level IV trauma centers were included in the hospital portion of the Uncompensated Care Reimbursement Distribution Method.

weights for the qualifying uncompensated care cases that the Level I-III trauma centers submitted to their respective trauma care region.[15] Meanwhile, participating physicians could apply for reimbursement for uncompensated care costs based on the Resource-Based Relative Value System (RBRVS). However, only certain physician specialties were eligible to apply for the uncompensated care trust fund dollars: designated attending or admitting trauma/general surgeons, orthopedic surgeons, neurosurgeons, and anesthesiologists. Reimbursements for uncompensated care did not include reimbursements for emergency room physicians (including mid-level providers) or other physicians/surgeons such as pediatric surgeons, plastic surgeons, or oral/maxillary surgeons that may have provided trauma care.

Also, EMS providers did not receive funding under the uncompensated care funding method. Since EMS already received nearly $2 million a year at the time through the Emergency Medical Services Operating Fund, funded by a $5 assessment on all moving traffic violations, the 1997 Trauma Care Task Force reasoned that such funding was sufficient. The task force further cited that 89% of the population had access to advanced life support and the funding could be used to retrain what was then a surplus in nursing personnel to extend advanced life support to the remaining segment of the population.

In 2004, the Mississippi Trauma Advisory Committee recommended and the Board of Health adopted significant revisions to the trauma care rules and regulations, giving Level IV trauma centers a flat annual reimbursement of $10,000. Before the revisions, the Department of Health had reimbursed Level IV trauma centers in the same manner as Level I-III centers (per uncompensated trauma case).

Why did the state change from the previous distribution method to the current method?

MTAC and the Department of Health decided to change distribution methods because the Reimbursement for Uncompensated Care method was labor-intensive and inadequately funded to reimburse hospitals and physicians for uncompensated trauma costs. Further, the reimbursement method did not

[15] Each hospital or each physician filed a claim for each uncompensated care patient online through Horne CPA. Horne CPA then calculated the reimbursement based on the amount available for distribution. For Level I-III trauma centers, Horne CPA used a formula using the Diagnosis Related Group (DRG) relative weights for scoring of the patient and assigned a multiplier (the more severe the patient's trauma injuries, the higher the multiplier). A hospital or physician's percentage of the reimbursement was equal to the hospital's or physician's sum total of patients' scores as a percentage of the total of the overall total patients' scores.

give credence to the difference in designation levels, investment costs, and trauma capabilities of the varying trauma centers.

During its 2007 Regular Session, the Legislature enacted Senate Bill 2863, which created a Trauma Care Task Force to review the status of the state's trauma care system and determine adequate funding requirements for the system. Following completion of the task force's work, the Legislature identified other revenues to be deposited into the Trauma Care Systems Fund that significantly increased the financial resources dedicated to the system (e. g., an increased traffic violation assessment and all-terrain vehicle/motorcycle fees).

One action taken by the Board of Health in response to recommendations of the task force was a revision in the methods used by the Department of Health to distribute balances of the Trauma Care Systems Fund. Rather than reimbursing hospitals and certain physician specialties for expenses associated with providing uncompensated care to trauma patients, the department adopted regulations to distribute funds based on each hospital's trauma center level designation and severity of trauma cases treated.

Based on the recommendations of the 2007 Trauma Care Task Force, the Board of Health ultimately made the decision to change the way to distribute funding for the statewide trauma care system from the prior uncompensated care funding method to the current disbursement funding method for several reasons.

- *Under the Reimbursement for Uncompensated Care method, the process for filing for reimbursement was labor-intensive.* The regulations required hospitals and physicians to analyze data in the trauma registry to identify those trauma patients that qualified for uncompensated care. Based on this analysis and completion of applicable forms, hospitals and physicians could then request reimbursements from the department to cover expenses for providing uncompensated care for trauma patients. Department of Health staff then had to review each submitted uncompensated trauma claim to verify if it was eligible for reimbursement.
- *The Reimbursement for Uncompensated Care method was insufficiently funded to reimburse hospitals and physicians for uncompensated trauma costs.* Not only was the Reimbursement for Uncompensated Care method labor-intensive, the Trauma Care Systems Fund had insufficient funds to reimburse hospitals and individual physicians for uncompensated charges per eligible uncompensated trauma case when they filed for reimbursement. For example, between 2006 and 2008, the Legislature found additional or increased current self-generated revenue funding sources for the Trauma Care Systems Fund, increasing the funding

available for distribution to trauma centers and physicians to over $20 million in 2008 (from $9 million in 2006). However, in 2008, for the hospital portion, the Trauma Care Systems Fund only reimbursed Level I-III trauma centers 10.4%, equating to $14.35 million of the $137.6 million in charges. Level I trauma center University Mississippi Medical Center received only $6.5 million in reimbursements toward $59 million in charges while Level III trauma center Ocean Springs Hospital received $230,000 in reimbursements toward $2.9 million in charges.

For the anesthesiologists' portion, the Trauma Care Systems Fund reimbursed $1.0 million of the $2.5 million in charges (40%). For the surgeons' portion, the Trauma Care Systems Fund reimbursed $5.1 million of the $11 million in charges (46.4%).

- *The Reimbursement for Uncompensated Care method did not give credence to the difference in designation levels, investment costs, and trauma capabilities of the varying trauma centers.* Given the decline in the number of Level II and Level III trauma centers from 2002 to 2006, the task force saw a need to encourage investment in Level I-III trauma centers and recommended passing a mandatory "play or pay" provision requiring all Level I-III trauma centers to participate at their designated level.

Who developed the current method of distributing the Trauma Care Systems Fund and how does it work?

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed the current method for distributing the Trauma Care Systems Fund. The current method distributes $10,000 to each Level IV trauma center and also permits each one to file for an additional $10,000 in trauma education-related reimbursement. Depending on the amount of money available to be distributed, the current method also distributes funding to EMS providers based on the population of the county in which the EMS provider is located; to Level I-III trauma centers based on their designation level and the number and severity of trauma patients they treat; and to the burn center(s).

Entities that Developed the Current Method of Distributing the Trauma Care Systems Fund

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed the current method for distributing the Trauma Care Systems Fund.

The Mississippi Trauma Advisory Committee (MTAC), with support from Department of Health staff, developed the

Mississippi Trauma Care System Regulations' current method for distributing the Trauma Care Systems Fund. The work of developing the funding method fell to two MTAC subcommittees: the Rules and Regulations Subcommittee and the Functionality Subcommittee, which looks at the functionality of the statewide trauma care system. Members of the two subcommittees included:

- Dr. John Porter, Trauma Medical Director at the University of Mississippi Medical Center [UMMC], representing the American College of Surgeons, Mississippi Chapter;
- Dr. Norman Miller, representing the Mississippi Department of Rehabilitation Services;
- Amber Kyle, representing the Mississippi Emergency Nurses Association (employed by UMMC);
- Doug Higginbotham, representing the Mississippi Hospital Association;
- Dr. Rick Carlton, representing the American College of Emergency Physicians (employed by St. Dominic Hospital); and,
- Dr. Clyde Deschamp, representing Central Mississippi Emergency Medical Services District (employed by UMMC).

The Horne CPA firm assisted by providing the calculations to determine the potential costs and proposed distribution amounts, as well as value of the weights assigned within the formulated method. The Board of Health had final approval authority regarding the method chosen.

How MTAC Determined the Current Method of Distributing Funds for the Trauma Care Systems Fund

MTAC determined the current method of distributing funds for the Trauma Care Systems Fund by establishing a list of functional and system priorities for the Trauma Care System and distributing funding accordingly.

PEER Report #568 described the Department of Health's detailed formula for distributing amounts from the Trauma Care Systems Fund to the trauma care regions, the Level I-IV trauma centers, burn center, and emergency medical services providers. This section describes how the current distribution method was developed.

After several discussions, the MTAC Rules and Regulations Subcommittee and the MTAC Functionality Subcommittee established the following list of priorities for the Trauma Care Systems Fund:

1. Provide emergency transport to a Level I or II trauma center capable of providing neurological surgery services
2. Provide trauma center funding based on capability of providing definitive surgical care
3. Determine how to divide trauma center funding between Level I, Level II, and Level III trauma centers
4. Fund the burn center
5. Allocate $10,000 to each Level IV trauma center for participation in the trauma system and to cover costs of entering data in the trauma registry

The following paragraphs include brief discussions of each of these priorities.

- *Provide emergency transport to a Level I or II trauma center capable of providing neurological surgery services*--From a functionality standpoint, MTAC wanted to ensure that all trauma patients, regardless of geography, had access to a fully functioning trauma center, which required the trauma center to provide neurological surgery services. Since only Level I and Level II trauma centers provide neurological surgery services, the statewide trauma system needed to be able to transport the state's severe trauma patients reliably to the Level I trauma centers (in Jackson, Memphis, and Mobile) or to the Level II trauma centers (in Tupelo, Hattiesburg, Gulfport, and Pascagoula). Therefore, funding EMS was the new funding method's top priority, since EMS needed to be available to transport trauma patients to the Level I and Level II trauma centers.

  MTAC originally considered funding EMS at 5% or 10% of the distribution method, but made the decision to distribute 15% of the available Trauma Care Systems Fund funding to EMS providers to ensure that there was enough incentive for EMS providers to participate in the trauma system, be on call when needed, and meet the standards established.[16] To distinguish between small EMS providers and large EMS providers, MTAC chose to distribute funding based on the county census population. All counties with a population of less than 15,000 receive the same level of EMS funding, while counties with a population of 15,000 or more receive additional funding based on their actual population.

[16] According to Dr. Miller (a member of one of the MTAC subcommittees that worked on developing the current funding method), MTAC consulted with William Bassett, Vice President of Administration for MedStat Ambulance in Winona, regarding this issue.

- *Provide trauma center funding based on capability of providing definitive surgical care*[17]--MTAC and the Board of Health determined that since Level IV trauma centers do not provide definitive surgical care that includes 24/7 trauma surgery, orthopedic surgery, and anesthesia care, these trauma centers do not meet the board's goal of delivering the trauma patient to the right place at the right time. Therefore, MTAC and the Board of Health decided to divide funding for trauma centers based on the level of care the trauma centers could offer, citing a clear break between the care that Level I-III trauma centers can provide and Level IV trauma centers cannot.
- *Determine how to divide funding between Level I, Level II, and Level III trauma centers*--To divide funding between Level I, Level II, and Level III trauma centers, MTAC had two competing priorities: (a) reward the trauma centers for their commitment and reimburse them for their increased costs; and (b) reimburse for the uncompensated trauma costs but in a manner that reduces the workload on the hospitals and Department of Health staff.

  To encourage the trauma centers' commitment and to help compensate them for their increased costs, MTAC decided to distribute 30% of the available Trauma Care Systems Fund funding to Level I-III trauma centers based on their designation level. MTAC and the Board of Health determined that despite the fact that the Level I and Level II trauma centers both offer neurological surgery, Level I trauma surgeons are typically employed full-time by the trauma center and serve in the hospital as opposed to operating clinics and serving on call as they might in a Level II or Level III trauma center. Therefore, Level I trauma centers were considered the benchmark and entitled to more funding.

  To reimburse the Level I-III trauma centers for their costs, MTAC and the Board of Health decided to distribute 50% of the available Trauma Care Systems Fund funding to the portion of funding for Level I-III trauma centers based on the number and severity of the trauma of the patients each Level I-III trauma center treated. To obtain the scores, the MTAC and the Board of Health decided to use the Mississippi Trauma Registry to record patient trauma data and produce an Injury Severity Score (ISS) for each trauma patient.

  Each Level I-III trauma center must distribute at least 30% of the funding distributed to its respective trauma center to physicians' salaries.

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[17] *Definitive surgical care* refers to the capability of a trauma center to provide trauma surgery, orthopedic surgery, and anesthesia care twenty-four hours a day, seven days a week.

- *Fund the burn center*--MTAC and the Board of Health then decided to distribute the remaining 5% to the burn center. If in the future there is no burn center, the amount distributed to the burn center would be added to the fixed portion for Level I-III trauma centers, raising the amount from 30% of the available Trauma Care Systems Fund funding to 35%. At the time of establishing the formula, there was not a burn center in the system, but since then, the Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital in Brandon has joined the system.
- *Allocate $10,000 to each Level IV trauma center for participation in the trauma system and to cover costs of entering data in the trauma registry*--MTAC decided to distribute an additional $10,000 to each Level IV trauma center for administrative purposes, with no restrictions on how Level IV trauma centers could spend the money. Department of Health staff and MTAC members met with the Mississippi Hospital Association and with hospital administrators concerning the requirements for Level IV trauma centers under the revised method. In particular, they discussed what would be sufficient funding for Level IV trauma centers to provide the mandatory trauma registry data, since regardless of whether a hospital participated in the trauma system, all licensed, acute care hospitals had to comply with and enter data in the trauma registry.

  However, unlike Level I-III trauma centers, Level IV trauma centers were not required to participate in the trauma system and thus could opt out without any non-participation fee. More importantly, Level IV trauma centers, unlike Level I-III trauma centers, do not provide definitive surgical care.

  In 2010, the Board of Health approved distributing an additional $10,000 in the form of educational grants to each Level IV trauma center to reimburse them for providing trauma-related education to their staffs.

  See Appendix E, page 67, for an illustration of the current Trauma Care Systems Fund distribution method.

What are the major differences between the previous distribution method and the current distribution method?

The difference in the two distribution methods is that the Trauma Care System Fund no longer reimburses hospitals and physicians for uncompensated trauma costs based on claims submitted. Instead, funds are distributed to trauma centers based on their designation and on the number and severity of trauma patients treated. Also, the Trauma Care Systems

Fund distribution now includes EMS providers and an expanded pool of eligible physicians.

The major differences between the previous distribution method and the current method are:

- *Inclusion of EMS providers*--EMS providers are eligible for trauma funding from the Trauma Care Systems Fund under the current distribution method, but were not eligible under the previous Reimbursement for Uncompensated Care method.
- *Distributions to Level I-III trauma centers*--Under the Reimbursement for Uncompensated Care method, Level I-III trauma centers could only receive funding based on uncompensated care costs. Under the current distribution method, the Level I-III trauma centers receive a fixed distribution based on the size of the distribution, the weighting of each level, and the number of each level of facility in the state, with Level Is receiving the most and Level IIIs receiving the least. This is based on trauma care levels and their respective trauma care commitments, capabilities, costs, and burdens. Then Level I, Level II, and Level III trauma centers receive funding based on the number and severity of the patients treated. Because alpha and bravo[18] trauma patients should not be sent to Level IV trauma centers, as outlined in the destination guidelines[19] in the *Mississippi Trauma Care System Regulations,* and because priority is on the Level I-III trauma centers, which have higher costs, Level IV trauma centers are not included in the variable funding portion of the current distribution method.
- *Payments to eligible physicians*--Under the current distribution method, Level I-III trauma centers are required to pay at least 30% toward physician salaries. Under the previous Reimbursement for Uncompensated Care method, physicians still received 30% of the distribution, but had to apply for reimbursement for uncompensated care costs associated with patient trauma care.
    - Under the previous Reimbursement for Uncompensated Care method, only designated attending or admitting trauma/general surgeons, orthopedic surgeons, neurosurgeons and anesthesiologists were eligible to apply for reimbursement for uncompensated care claims if they submitted a claim for reimbursement for

[18] As noted previously, trauma victims are assessed by an EMS provider based on defined criteria as being an alpha and/or a bravo patient based on their condition and how their injuries occurred. If the trauma victim is not classified as an alpha or bravo patient, the EMS provider may transport the patient according to EMS protocols.

[19] Appendix B: Consolidated Trauma Activation Criteria and Destination Guidelines. *Mississippi Trauma Care System Regulations.* August 23, 2012.

trauma patients they treated. All eligible physicians meeting the above criteria at Level I-IV trauma centers were eligible to apply.

- Under the current distribution method, all physicians treating trauma, including emergency room physicians and pediatric surgeons, are eligible for receiving funding from the Trauma Care Trust Fund. However, only Level I-III trauma centers were included in the distribution so only Level I-III trauma center physicians are eligible to receive pay for services from their respective trauma centers.

- *Level IV trauma centers*--Level IV trauma centers each received $10,000 under both methods for disbursing the Trauma Care Systems Fund. However, under the Reimbursement for Uncompensated Care Method, physicians at Level IV trauma centers were also eligible to apply separately for reimbursement for uncompensated care.

Have the MTAC and the Department of Health considered revising the current distribution method?

The MTAC and the Department of Health are studying potential options for revising the current Trauma Care Systems Fund distribution formula. Options include decreasing the fixed portion of the distribution formula and including Level IV trauma centers in the variable portion of the distribution formula, as well as determining whether the Level IV trauma center designation should be divided into two separate designations based on capabilities. However, MTAC is currently attempting to determine the total cost of trauma before moving forward with formula revisions.

MTAC and the Department of Health are studying potential options for revising the current Trauma Care Systems Fund distribution formula.

One potential option includes decreasing the fixed portion of the distribution formula and including Level IV trauma centers in the variable portion of the distribution formula.

One option includes revising the current Trauma Care Systems Fund distribution formula as follows:

- lowering the fixed portion of the distribution of Level I-III trauma centers from 30% to 10%;
- eliminating the two $5,000 semiannual distributions to each Level IV trauma center; and,
- raising the variable portion from 50% to 70% for Level I to Level III trauma centers and including the Level IV trauma centers, whereby Level IV trauma centers could

not receive less than two $5,000 semiannual distributions per year.

Preliminary runs show the above revisions might reduce the amount distributed to Level I-III trauma centers by $1.4 million per year and increase the amount distributed to Level IV trauma centers by a combined $1.4 million per year. Level IV trauma centers currently receive approximately $600,000 per year in fixed distributions ($10,000 each) and up to $600,000 per year in funding for educational/training reimbursements (up to $10,000 each).

The Department of Health and MTAC are studying this option for two reasons. First, Level I trauma centers located out-of-state may disproportionately be getting more funding under the system than Level II trauma centers in state, especially when considering each trauma center's workload. However, the Level I trauma centers located out of state receive more funding because of the higher weighted value devoted to the fixed portion of the formula versus the variable portion of the formula. Second, not all Level IV trauma centers stabilize and/or treat the same number of patients, yet they are funded the same. For example, Neshoba County reported treating 171 "A"[20] trauma patients during the first half of 2012 compared to seven at Franklin County Memorial Hospital. Also, a few Level IV trauma centers may treat as many or more trauma patients as some Level III trauma centers, but may not be able to maintain Level III trauma center designation.

MTAC and the Department of Health are studying developing two separate designations for current Level IV trauma centers based on the centers' capabilities.

MTAC and the Department of Health are also studying dividing the Level IV trauma center designation into two separate designations based on difference in trauma centers' capabilities. The idea is that Level IV trauma centers with more defined surgical capabilities and general trauma units, but that do not meet the standards of being a Level III trauma center (because they cannot maintain twenty-four hour a day, seven-day a week orthopedic care), would remain Level IV trauma centers. Examples would include Neshoba County General Hospital and Northwest Mississippi Regional Medical Center (Clarksdale). The remaining Level IV trauma centers would become Level V trauma centers. The Level V trauma centers would have an Emergency Medicine department, but might not have general surgery capability. How these two separate designations for Level IV trauma centers would affect

[20] Category "A" trauma patients are trauma patients diagnosed by physicians with an Injury Severity Score of 1-10.

distribution of money from the Trauma Care Systems Fund has not yet been determined.

The MTAC is currently attempting to determine the total cost of trauma care before moving forward with revisions to the distribution method.

Before moving forward with any revisions in the distribution method, the Mississippi Trauma Advisory Committee Rules and Regulation Subcommittee's finance task force is working with the Mississippi Hospital Association to attempt to determine the total cost of providing trauma care at the trauma center and emergency medical service level, including what portion of trauma care costs are uncompensated trauma care costs. For example, the goal of the study is to determine the baseline cost for operating a hospital, including costs such as administrative, maintenance, infrastructure, pharmacy, and nursing. Then, the study would determine the costs for operating trauma centers at the different levels based on the standards required to maintain a specific trauma center designation beyond the baseline costs for operating a hospital.

Through 2008, Level I-III trauma centers and eligible physicians submitted their costs for treating uncompensated trauma patients in order to collect reimbursements for uncompensated care. However, this did not capture the total cost of trauma care, since not all trauma claims were filed and only uncompensated trauma care costs were reported.

How does the Department of Health spend its portion of the Trauma Care Systems Fund to support the operations of the Mississippi Trauma Care System?

Because the state's trauma care system is designed to "reduce the death and disability resulting from traumatic injury," it is important that the state's trauma centers and emergency medical services providers receive the majority of available funds. Therefore, the Department of Health's portion of the Trauma Care Systems Fund for administrative expenses must be kept to a reasonable limit while ensuring adequate support of the trauma care system.

Regardless of the method used to distribute money from the Trauma Care Systems Fund, the state should ensure that as much of the fund as possible is available to help support the system's operation. Therefore, the expenses of the Department of Health for administering the trauma care system expenses must be kept to a reasonable amount.

This chapter will address the following:

- What authority does the Department of Health have to expend amounts from the Trauma Care Systems Fund for administrative purposes?
- For the period FY 2010 through FY 2012, how much did the Department of Health expend from the Trauma Care Systems Fund for administrative purposes?

What authority does the Department of Health have to expend amounts from the Trauma Care Systems Fund for administrative purposes?

MISS. CODE ANN. Section 41-59-75 (1972) provides authority to the Department of Health to expend amounts from the Trauma Care Systems Fund for administrative purposes. The department's goal is to limit such expenditures to less than 10% of available funding.

As discussed in PEER Report #568, MISS. CODE ANN. Section 41-59-75 (1972) establishes the Mississippi Trauma Care Systems Fund to serve as the depository for assessments and other funds designated by the Legislature for support of the state's trauma care system. With regard to the Department of Health, CODE Section 41-59-75 states that funds will be available to the department for

"administration and implementation of the comprehensive state trauma care plan."

CODE Section 41-59-75 is silent regarding the total amount or percentage of Trauma Care Systems Fund that the Department of Health may use for administrative purposes. PEER knows of no general standard or benchmark that could be applied to determine whether the department expends too much or too little of trauma care funds for administrative purposes. As an example, governmental entities that receive federal grants generally are not held to a specific amount or percentage for administrative expenditures, but are required to ensure that costs are reasonable and do not exceed that which would be incurred by a prudent person under the circumstances prevailing at the time the decision was made to incur the costs.

According to the Department of Health's Trauma System Administrator, the goal of the department's staff is to limit the department's administrative expenses associated with the state's trauma care system to less than ten percent of the amount available for distribution. As shown in Exhibit 5, page 38, for the period FY 2010 through FY 2012, the department's administrative expenditures amounted to 3.9% of available funding.

For the period FY 2010 through FY 2012, how much did the Department of Health expend from the Trauma Care Systems Fund for administrative purposes?

The Department of Health spent approximately $2.9 million from the Trauma Care Systems Fund for administrative purposes for the period FY 2010 through FY 2012.

As illustrated in PEER Report #568, since FY 2010, the department has utilized a detailed formulated method to distribute amounts from the Trauma Care Systems Fund. In accordance with the method, after determining the balance available in the Trauma Care Systems Fund for distribution, the department calculates the amount of the funds necessary to cover expenses associated with the administration and development of the state's trauma care system at the departmental level. Once determined, this amount is set aside for the department's administrative costs and is not available for further distribution to trauma centers and emergency medical services providers.

As shown in Exhibit 5, page 38, the department expended $2,910,437 to cover its administrative expenses related to the state's trauma care system for the period FY 2010 through FY 2012. The following sections provide details regarding the areas in which the department made such expenditures.

Exhibit 5: Department of Health's Administrative Expenditures Related to the State Trauma Care System, FY 2010 through FY 2012

Major Object of Expenditure	FY 2010	FY 2011	FY 2012	Total
Personal Services (Salaries and Fringe Benefits)	$331,014	$384,843	$409,940	$1,125,797
Travel	24,462	17,892	27,106	69,460
Contractual Services	532,185	500,981	617,775	1,650,941
Commodities	17,394	16,511	22,516	56,421
Capital Outlay-Equipment	1,375	1,435	5,008	7,818
Subsidies, Loans and Grants	0	0	0	0
Total Department Administrative Expenditures	**$906,430**	**$921,662**	**$1,082,345**	**$2,910,437**
Percentage of Administrative Expenditures in Relation to Trauma Systems Fund Available for Distribution	**3.5%**	**4.8%**	**3.8%**	**3.9%**

NOTE: The Contractual Services category includes the following amounts for travel by contract workers: FY 2010, $14,439; FY 2011, $18,171; and, FY 2012, $12,600.

SOURCE: Mississippi Department of Health financial information.

The department expended approximately $1.1 million for salaries and fringe benefits of department employees and contract workers assigned in whole or in part to administration of the state's trauma care system.

Organizationally, the Bureau of Emergency Medical Services and Trauma System Development is part of the department's Health Protection program. The department staffs the bureau by assigning employees and contract workers to carry out the administrative duties related to the state's trauma care system.

As shown in Exhibit 6, page 40, as of May 16, 2013, the bureau had fifteen positions, consisting of ten state employees and five contract workers. The percentages listed in Exhibit 6 represent the portion of each position's salary paid from the Trauma Care Systems Fund, because some bureau employees and contract workers had non-trauma-related duties, thus only a portion of their salaries were paid with money from the Trauma Care Systems Fund.

The department expended approximately $114,000 for travel related to the trauma care system during FY 2010 through FY 2012.

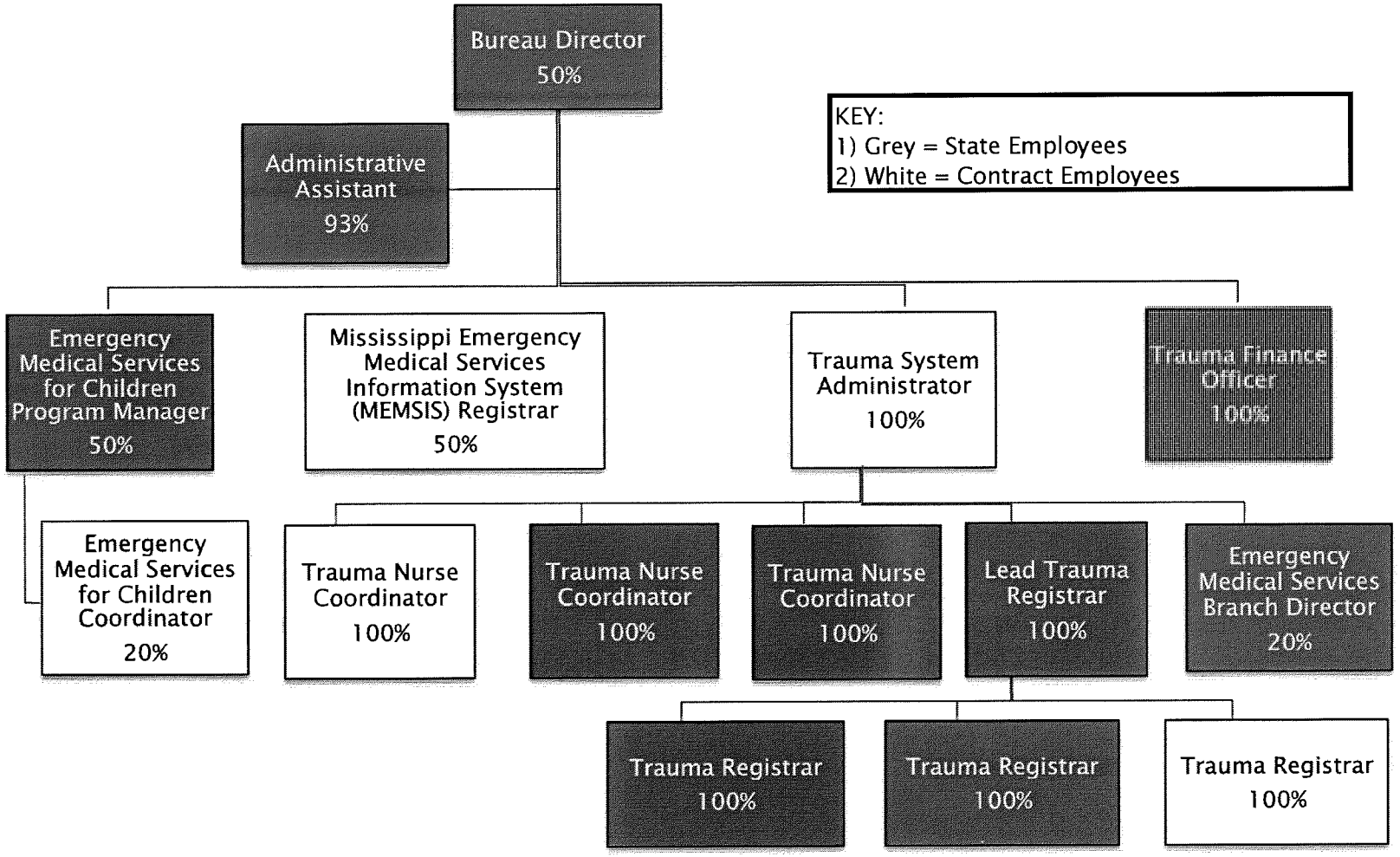
As stated in PEER Report #568, participants in the Mississippi trauma care system are:

- the state's Department of Health;
- the Trauma Care Advisory Committee;
- seven designated trauma care regions and their respective boards of directors;
- hospitals qualifying as trauma centers and a burn center; and,
- emergency medical services providers.

Given these participants and their locations throughout the state, department employees and contract workers are required to incur expenses in order to travel to these locations and ensure the participants' compliance with state law and departmental regulations. In addition, the department's employees and contract workers typically attend regional and national conferences to stay abreast of current issues related to trauma and emergency medical services.

For the period FY 2010 through FY 2012, the department expended $114,670 from the Trauma Care Systems Fund to cover travel costs incurred by departmental employees and contract workers related to the trauma care system. The department paid $69,460 from the "travel" major object of expenditure for travel of department employees and $45,210 from the "contractual services" major object

Exhibit 6: Organizational Chart for the Bureau of Emergency Medical Services/Trauma System Development, Mississippi Department of Health, as of FY 2012



NOTE: Percentages represent the portion of wages and benefits, if applicable, paid with Trauma Care Systems Funds

SOURCE: Bureau of Emergency Management System/Trauma System Development Organizational Chart. Mississippi Department of Health.

of expenditure for travel of contract workers. Primary reasons for travel included:

- attendance at regional meetings and advisory group meetings;
- compliance inspections;
- educational visits and training; and,
- financial audits.

For FY 2010 through FY 2012, the department expended $1.65 million for contractual services to develop and implement the state's trauma care system.

As stated on page 9, best practices for a statewide trauma care system include the coordination of a network of trauma centers and emergency medical services system, state and local governments, and other health care resources. To accomplish this task, the Department of Health contracts with vendors and health care professionals to provide services that are not available through the department.

As Exhibit 5, page 38, shows, from FY 2010 through FY 2012, the department expended $1,650,941 to contract for such professional services. (This included $45,210 for travel for contractual workers, as noted on page 39.) Exhibit 7, page 42, shows that the major contractual services expenses included payments for contract workers and their related travel, technological support for data systems, and services of health professionals.

The department expended approximately $56,000 in commodities related to the trauma care system during FY 2010 through FY 2012.

The *Mississippi Agency Accounting Policies and Procedures* (MAAPP) manual defines commodities as "all materials and supplies which are consumed by use in any function and shall include expendable items not required on any inventory of capital assets."

During FY 2010 through FY 2012, the Department of Health expended $56,421 from the Trauma Care Systems Fund on commodity items. The major commodity expenditures (representing 75% of total commodity expenditures for the period) included $22,036 for office supplies and $20,417 for food/refreshments for committee meetings and training sessions.

Exhibit 7: Department of Health's Administrative Expenditures Related to the State Trauma Care System, Contractual Services Expenditures, FY 2010 through FY 2012

Contractor	Services Provided	Total
Digital Innovation	Vendor for the state's trauma registry system	$518,808
Dr. Frank Ehrlich	Lead trauma consultant in trauma system development and center inspections	116,365
Image Trend	Vendor for the state's emergency medical services data system	96,295
Schaus Professional Services, LLC	Vendor for online trauma center application program	53,000
Horne CPA	CPA firm for calculating fund distributions	47,000
Susan Werner, RN	RN for performing trauma center designation surveys and educational visits	37,261
Pomeroy IT Solutions	Software maintenance	36,475
Insight Public Sector	Software acquisition, installation and licensing	25,827
R J Young	Supplier for copy and fax machines	18,545
Mythics	Software maintenance	12,707
Lianne Brown, RN	RN for performing trauma center designation surveys and educational visits	11,446
Orion Health	Software acquisition, installation and licensing	11,170
Contract Workers	Assistance in designing and implementing the state's trauma care system	353,372
Other Miscellaneous Expenses	Various contractual services expenses	267,460
Total		**$1,605,731**

NOTE: In addition to the $1,605,731, the Contractual Services category includes $45,210 in travel expenditures paid to contract workers, representing a total of $1,650,941 expended from the Contractual Services category for the three fiscal years. See page 41.

SOURCE: Mississippi Department of Health financial information.

For FY 2010 through FY 2012, the department expended approximately $7,800 from the Trauma Care Systems Fund for capital outlay items.

The *Mississippi Agency Accounting Policies and Procedures* (MAAPP) manual states that capital outlay expenses include the cost of land, buildings, equipment, machinery, furniture, fixtures, and related items. Such items must be included in the agency's asset inventory.

During FY 2010 through FY 2012, the department expended $7,818 from the Trauma Care Systems Fund on capital outlay items. Those expenditures included $5,358 for laptop computers and $2,460 for office furniture for the Emergency Medical Services director.

What are the opportunities and limitations of Mississippi's trauma care system and the current method of distributing the Trauma Care Systems Fund?

While the Mississippi Trauma Care System has opportunities for improvement in its design, external environmental factors pose significant fiscal and logistical challenges and system design limits options for developing or upgrading trauma centers. Further, while the current level of funding provides flexibility to the trauma centers to target trauma needs, the current level is not sufficient to cover trauma centers' uncompensated trauma care costs, is not designed to enable a trauma center to improve its designation to a higher level, and does not specifically provide for the "golden hour"[21] of trauma care.

This chapter addresses the following:

- What are the opportunities and limitations of the design of the Mississippi Trauma Care System?
- What are the opportunities and limitations of the current level of funding and method of distributing the Trauma Care Systems Fund?

What are the opportunities and limitations of the design of Mississippi's trauma care system?

Although Mississippi's trauma care system has improved its prehospital methods for routing trauma patients to the most appropriate trauma centers, has increased the number of trauma centers, and has developed a statewide performance improvement process, many opportunities still exist for improvement in its design. Limitations include varying degrees of access to and growth of Level I-III trauma centers throughout the state, fiscal challenges resulting from high numbers of uninsured and underinsured patients and overworked emergency rooms, and few options for developing or upgrading trauma centers.

As discussed on pages 17 through 18 of this report, the Mississippi Trauma Care System has improved its prehospital methods for routing a trauma patient to the most appropriate trauma center, has increased the number of trauma centers, and has developed a statewide performance improvement process. While many factors

[21] The *golden hour* is the first sixty minutes after a traumatic injury. It is widely believed that a serious injury victim who reaches an emergency room within those sixty minutes has a greater chance of survival if he or she receives definitive trauma care within the first hour. However, less than thirty percent of the continental United States is within one hour of a Level I or Level II trauma center.

have arguably played a role in controlling the number of trauma deaths, the slight increase in trauma-related deaths from 2000 to 2010 in relation to the 196% increase in trauma-related injuries seems to indicate that the system has been effective in providing trauma care and reducing the number of deaths from trauma-related injuries.

However, PEER notes that many opportunities still exist for improving the design of the state's trauma care system. Such opportunities are limited to some extent by the following:

- access to and growth of Level I-III trauma centers is not equal throughout the state;
- because of high rates of uninsured patients and Medicare or Medicaid patients, as well as overworked emergency rooms, the trauma system faces significant fiscal challenges; and,
- a hospital's choice regarding its level of participation in the trauma care system is made independently of the Department of Health and the system is not designed or funded to develop new trauma centers or upgrade trauma centers.

Access to and Growth of Level I-III Trauma Centers Varies by Location

While the goal of the Mississippi Trauma Care System is to transport each trauma patient to the appropriate level trauma center, the distance for medical transport and ease of access to a Level I-III trauma center is not equal throughout the state. Also, growth in the trauma system has not been equally distributed among the regions of the state.

While the goal of the Mississippi Trauma Care System is to transport each trauma patient to the appropriate level trauma center, the distance of medical transport and ease of access to Level I-III trauma centers is not equal throughout the state. For example, the four counties in the Coastal Region have access to the Level I trauma center in Mobile, AL, as well as to two Level II trauma centers and three Level III trauma centers. In contrast, the fourteen-county Central Region has one Level I trauma center and two Level III trauma centers, but the remainder are Level IV trauma centers. The seven-county Southwest Region has nearby access to only one Level III trauma center and six Level IV trauma centers.

Also, growth in the trauma system has not been equally distributed among the regions of the state. In 2006, the Coastal Region had two Level III trauma centers and six Level IV trauma centers. By February 2013, the Coastal Region still had eight trauma centers, but instead had improved to have one Level I trauma center, two Level II trauma centers, three Level III trauma centers, and only two Level IV trauma centers. In contrast, in 2002 the

Southwest Region had four Level III trauma centers and three Level IV trauma centers. As of February 2013, the Southwest Region had dropped to one Level III trauma center and six Level IV trauma centers.

Practically speaking, strengths and weaknesses of trauma care coverage in Mississippi may be assessed by simply looking at where hospitals are located geographically. Examples include the following:

- The Delta has minimal trauma care coverage. Winona (Montgomery County) and Quitman County are particular areas of weakness in the Delta. If a trauma patient in the Delta sustained a trauma requiring Level I-III care, the patient would have to be transferred to Jackson, Southaven, Greenville, or Oxford because the Level IV trauma centers in the Delta would not be capable of treating the trauma patient.
- Franklin County in southwest Mississippi has only two ambulances and Franklin County Memorial Hospital operates its emergency room with two nurse practitioners instead of full-time licensed physicians. (PEER notes that Franklin County Memorial Hospital only received fifteen trauma patients in CY 2012.)

The Department of Health has not conducted formal analysis studying the strengths and weaknesses of trauma center coverage in Mississippi. According to the department, the Trauma Care Systems Fund does not generate enough revenue to address the weaknesses in geographic distribution of trauma centers in the system. For example, the Mississippi Trauma Care System lacks the funding to turn the Level IV trauma center in Greenwood-Leflore into a Level II trauma center or to recruit the necessary physicians to the Delta, specifically orthopedic surgeons and neurosurgeons, to staff a Level II trauma center 24/7.

Emergency Rooms Face a Financial Burden but Have Limited Funding

Because of high rates of uninsured patients or Medicare or Medicaid patients, who are often underinsured, the trauma system faces significant fiscal challenges as part of the overall emergency care infrastructure. Further, because Mississippians that should be cared for in a doctor's office sometimes seek treatment at emergency rooms, emergency room staffs face increased demands. As a result, trauma victims may not have access to the timely care they need.

According to John Osborn, administrator of the Mayo Clinic Trauma Center in Minnesota:

> *The problem that a trauma center faces is that it costs money every day to have a trauma center, whether or not the trauma*

> *center sees a patient, because the trauma center has to pay to have the surgeons on call at night and to have an operating room ready 24/7 as well as specialists available to respond to patients with no idea of what tomorrow's volume is going to be.*

The ability of a trauma center to plan for reimbursement of its upfront commitment cost is limited. Further, hospitals can charge insurers an activation fee for bringing the trauma team together in cases in which EMS has notified the emergency department that a critically injured patient is on the way. However, it is not uncommon that the patient is not as severely injured as first expected and in such cases, activation payment is not guaranteed.

Adequate trauma patient care throughout the state is further affected by a variety of external factors.

- *Mississippi hospitals have fewer cost recovery resources.* As shown in Exhibit 8 on page 48, thirty-one percent of Mississippians have Medicaid or Medicare as their health insurance (compared to twenty-nine percent nationwide), which often pays less than the cost of services rendered. Nineteen percent of Mississippians have no health insurance coverage of any kind, compared to sixteen percent nationwide. Therefore, health care providers must cover the gap between the amount of money received to pay for health care and the cost of that health care with revenues from patients with private insurance. Compounding the problem is the fact that only 48% of Mississippians have private insurance, compared to 54% nationwide; thus, the "gap" between money for health care and health care costs is often greater in Mississippi than in other states.
- *Individuals with chronic illnesses that are not properly managed often use emergency rooms for care at advance stages of their diseases.* In addition to a high uninsured population, Mississippi also ranks above other states for chronic illnesses such as heart disease. According to the Kaiser Family Foundation, Mississippi ranked last in 2010 with 20.9% of Mississippians lacking access to primary care due to costs. Mississippi also has more of its citizens in poverty, with 22.6% below the federal poverty level in 2011, according to the U.S. Census Bureau.

Exhibit 8: Health Insurance Coverage of Mississippi and U. S. Populations, 2011

	Mississippi		United States	
Health Insurance Status	**Number**	**Percentage**	**Number**	**Percentage**
Employer	1,253,800	43%	149,350,600	49%
Individual	137,800	5%	15,416,100	5%
Medicaid	572,200	19%	50,670,200	16%
Medicare	361,600	12%	39,996,700	13%
Other Public	48,700	2%	3,846,400	1%
Uninsured	544,900	19%	48,611,600	16%
Total	**2,919,000**	**100%**	**307,891,600**	**100%**

The Mississippi Trauma Care System was established in part to compensate the trauma centers for serving the uncompensated trauma care population.

SOURCE: Statehealthfacts.org. The Henry J. Kaiser Family Foundation. 2011. March 29, 2013

> As previously cited by the Trauma Care Task Force in 2007, when chronic illnesses are not being properly managed due to poverty and lack of access to preventive care, patients often overutilize the health system at more advance stages of disease, with emergency rooms becoming the point of care for many low-income and uninsured individuals suffering from non-urgent conditions. Because Mississippians that should be cared for in a doctor's office often have to seek treatment at emergency rooms, emergency room budgets and emergency room staff face increased financial and operational pressure. As a result, trauma victims may not have access to the timely care they need for their critical injuries.

Combining these external factors with inadequate compensation to cover the cost of running emergency rooms (thus affecting the sustainability of the trauma system's member hospitals/trauma centers), the trauma system faces significant fiscal challenges as part of the overall emergency care infrastructure.

Hospitals Function Independently, with Limited Options for Growth

Whether a hospital chooses to be a Level I, II, III, or IV trauma center, or even to participate in the trauma system at all, is a decision made by individual hospitals, independent of the Department of Health. Further, the Mississippi Trauma Care System is not designed to nor sufficiently funded to develop new trauma centers or upgrade trauma centers to higher-level designations. However, Mississippi-licensed acute care facilities are required by MISS. CODE ANN. Section 41-59-5 (5) (1972) to participate in the trauma system at their assessed level or pay a non-participation fee.

The independent trauma centers that comprise the trauma system each function independently. Further, the Mississippi Trauma Care System is not designed to nor sufficiently funded to develop new trauma centers or upgrade current trauma centers to higher-level designations. As a result, whether a hospital chooses to be a Level I, II, III, or IV trauma center, or even to participate in the trauma system at all, is a decision made by individual hospitals, independent of the Department of Health.

As noted on page 50, currently some hospitals could be designated as Level II or Level III trauma centers, but opt to pay the non-participation fee instead of joining the trauma care system. One hospital could participate as a Level II trauma center, but opts to pay a non-participation fee and participate as a Level IV trauma center. A few other hospitals also choose not to participate as Level IV trauma centers. As a result, growth opportunities for the Mississippi Trauma Care System are limited.

The Emergency Medical Treatment and Labor Act mandates that all hospitals provide trauma care to patients within their capability, regardless of a patient's ability to pay.

Enacted by Congress in 1986, the Emergency Medical Treatment and Labor Act (EMTALA) mandates that all hospitals provide trauma care to trauma patients within their capability, regardless of a patient's ability to pay. Depending on the capabilities of the hospital, the requirements under EMTALA range from stabilizing the patient and arranging for transfer to an appropriate trauma center to treating the trauma patient. As a result, all hospitals are required to provide stabilizing treatment for patients with emergency conditions, including hospitals that opt not to partake in the Mississippi Trauma Care System. EMTALA also mandates that if a hospital is unable to stabilize a patient within its capacity or if a

patient asks, then a transfer to another facility must be arranged.

MISS. CODE ANN. Section 41-59-5 (5) (1972) requires Mississippi-licensed acute care facilities to participate in the statewide trauma system. However, Mississippi Trauma Care System Regulations only require hospitals designated as Level II or Level III trauma centers to pay a fee if they participate at a level lower than their assessed level.

As discussed in PEER Report #568, MISS. CODE ANN. Section 41-59-5 (5) (1972) requires all Mississippi-licensed acute care facilities to participate in the trauma system. However, *Mississippi Trauma Care System Regulations* only require hospitals to pay a fee if they participate at a level lower than their assessed level. However, while Level I and Level IV trauma centers are required to participate in the trauma system, they are not required to pay a fee.

As a result, "play-or-pay"[22] affects trauma centers designated as Level II and Level III in the state, but does not affect Level IV or Level I trauma centers in the state. Therefore, as of February 2013, play or play applied to twenty-two of the eighty-nine hospitals in Mississippi. Four Level II trauma centers and fifteen Level III trauma centers participate at their assessed level. Three hospitals currently choose not to participate (Mississippi Baptist Medical Center and Wesley Medical Center) or to participate at a level lower than assessed (St. Dominic-Jackson Memorial Hospital). Non-participation fees in FY 2012 were $3.7 million, comprising approximately 15% of Trauma Care Systems Fund revenue in FY 2012.

What are the opportunities and limitations of the current level of funding and method of distributing the Trauma Care Systems Fund?

Under the current funding level and distribution method, Level I-III trauma centers receive funds to subsidize a portion of the cost of the trauma centers. This gives more flexibility to trauma centers to expend the funds, within guidelines, as the trauma center deems necessary for trauma care. However, the current level of funding is not sufficient to cover trauma centers' uncompensated trauma care costs, is not designed to enable a trauma center to improve its designation to a higher level, and does not specifically provide for the "golden hour" of trauma care.

As noted on page 29 of this report, in developing the current method of distributing money from the Trauma

[22] *"Play or pay"* refers to the fact that any hospital that chooses not to participate in the trauma care system or that participates at a level lower than the level at which it is capable of participating, as determined by the Department of Health, must pay a non-participation fee as required by the Mississippi Trauma Care System Regulations.

Care Systems Fund, the MTAC subcommittees established the following list of priorities:

1. Provide emergency transport to a Level I or II trauma center capable of providing neurological surgery services
2. Provide trauma center funding based on capability of providing definitive surgical care
3. Determine how to divide trauma center funding between Level I, Level II, and Level III trauma centers
4. Fund the burn center
5. Allocate $10,000 to each Level IV trauma center for participation in the trauma system and to cover costs of entering data in the trauma registry

To some extent, the current distribution method addresses each of these priorities (see discussion on pages 29 through 31). However, as is the case with the design of the trauma care system (see pages 44 through 50), many opportunities still exist for improvement in the level and method of funding for the system. Although the current distribution method gives more flexibility to trauma centers to spend the money, within guidelines, as they deem necessary, the funding:

- is not sufficient to cover trauma centers' uncompensated trauma care costs;
- is not designed to enable a trauma center to improve its designation to a higher level; and,
- is not specifically provided for the "golden hour" of trauma care, other than that for EMS providers.

Trauma Centers are Allowed to Expend Funds, Within Guidelines, as Needed for Trauma Care

The current distribution method distributes money to the Level I-III trauma centers to subsidize a portion of the cost of the trauma centers. Such funding enables the trauma centers to expend the funds, within guidelines, as the trauma center deems needed for trauma care.

The current distribution method does not reimburse trauma centers for their costs, but it does subsidize a portion of the cost of Level I-III trauma centers, enabling the trauma centers to expend the funds, within guidelines, as the trauma center deems needed for trauma care. While at least 30% of the funding for each Level I-III trauma center must be distributed to physicians, the remaining funding may be distributed to physicians' salaries, nurses' salaries, administration/non-practitioner staff, and other trauma care expenditures. For example, a trauma center may hire an additional trauma surgeon, or contract for an

orthopedic surgeon or a pediatric surgeon, or buy equipment related to the immediate resuscitation or stabilization of a patient.

Funding Not Sufficient to Cover Uncompensated Costs

Despite legislative efforts to increase funding for the Trauma Care Systems Fund from approximately $9 million in 2006 to approximately $24 million in FY 2012, current funding remains insufficient to cover trauma centers' uncompensated trauma care costs.

In 2007, the Trauma Care Task Force found that "current state funding for uncompensated trauma care at $8 million annually covers only a fraction of the uncompensated trauma care cost burden trauma centers face, resulting in a declining number of hospitals and physicians who are willing to provide trauma services." In 2006, the Level I, II, and III trauma centers submitted approximately $90 million worth of charges for uncompensated care trauma patients and were reimbursed $5.6 million. At the time, the 2007 Trauma Care Task Force found that it would take at least $40 million annually to maintain trauma care in Mississippi at the 2007 levels.

Since FY 2009, the Trauma Care Systems Fund has received an average of approximately $25 million in revenue each year from traffic violation assessments, license tag fees, ATV/motorcycle fees, and non-participation fees.[23] However, as of 2008, Level I-III trauma centers and eligible physicians had submitted for reimbursement under the previous distribution method uncompensated trauma care costs totaling $151 million. Without significant increases in funding sources, the Trauma Care Systems Fund will not be capable of allocating funding to trauma centers necessary to cover their costs for stabilizing and treating uncompensated trauma care patients.

Regardless of how funding is distributed, the trauma centers will lose money treating the uncompensated care population. As a result, hospitals must generate revenue through some other means, including from other areas of the hospital and/or from patients with private insurance to recover the costs.

[23] See Appendix F, page 68, for a breakdown of revenue by source for the Trauma Care Systems Fund from FY 2009 through FY 2012.

Funding Not Designed to Improve Trauma Center Designation

The Mississippi Trauma Care System is not sufficiently funded to develop new trauma centers or to help upgrade current trauma centers to higher-level designations.

The Mississippi Trauma Care System is not sufficiently funded to develop new trauma centers or upgrade current trauma centers to higher-level designations. Such decisions are made by each individual trauma center, all of which are operated independently of the Department of Health (see page 49).

For example, if the Department of Health identified a need for a Level II trauma center in the Greenwood-Leflore area, the Mississippi Trauma Care System does not have sufficient funding to turn the Level IV trauma center Greenwood Leflore Hospital into a Level II trauma center or to recruit the necessary physicians to the Delta to staff a Level II trauma center. Also, such decisions would have to be made in cooperation with the Greenwood Leflore Hospital.

Complicating matters, as noted on page 47, due to the high numbers of uninsured and underinsured patients, as well as a low percentage of patients with private insurance in relation to the nationwide average, Mississippi hospitals have few cost recovery resources, thus limiting the capability of local hospitals to open or upgrade trauma centers.

Funding Not Specifically Provided for the "Golden Hour"

Funding is not specifically provided for the golden hour of trauma care, except funding for EMS providers.

Funding is not specifically provided or targeted for the first sixty minutes after a traumatic injury, termed the "golden hour" of trauma care because it is believed trauma patients have a higher chance of survival if they receive definitive care within the first hour, except funding for EMS providers. Because the Mississippi Trauma Advisory Committee and the Board of Health considered on-site care, retrieving, and then transporting trauma patients to the most appropriate trauma center to be top priority, emergency medical service providers receive 15% of the distribution.

Specifically, Level IV trauma centers do not receive funding to treat patients who arrive during the golden hour.

Level IV trauma centers each receive $10,000 intended to cover their costs for partaking in the trauma registry, as required by hospital licensing regulations. Level IV trauma

centers are also able to receive reimbursement for up to $10,000 in eligible educational and training expenses. However, unlike Level I-III trauma centers, Level IV trauma centers do not receive funding based on the number and severity of trauma cases they see. As a result, Level IV trauma centers do not receive funding to treat patients who arrive during the golden hour.

Instead, funding is distributed to Level I-III trauma centers using the variable portion of the distribution formula, based on the number and severity level of their trauma patients.

While each of the Level I-III trauma centers are capable of and do receive golden hour trauma cases, the Mississippi Trauma Care System does not track the costs associated with or attempt to provide funding to golden hour trauma cases. Under the variable portion of the Trauma Care System Fund distribution formula, funding is distributed to Level I-III trauma centers based on the number of trauma cases a trauma center receives and the severity level of each patient, with a multiplier added to recognize the cost differential between the severity categories of a trauma case.

Recommendations

1. The Mississippi Trauma Advisory Committee (MTAC) and the Department of Health should analyze trauma center coverage and emergency medical services coverage in the state. Based on this analysis, MTAC and the Department of Health should develop strategies to target coverage gaps in the trauma care system and a timeline for improving such coverage.
2. The Department of Health should periodically determine Mississippi's total cost of trauma care, specifically that portion that is considered to be uncompensated trauma care. The department should also develop and submit to the Legislature alternatives for funding to address more sufficiently the state's uncompensated trauma care costs.
3. MTAC and the Department of Health should continue their current efforts of analyzing the current Trauma Care Systems Fund distribution formula, with a goal of providing additional funding to Level IV trauma centers.

Appendix A: Executive Summary of PEER Report #568, *A Descriptive Review of the Mississippi Trauma Care Systems Fund* (January 3, 2013)

Introduction

In response to a legislative request, the PEER Committee reviewed the revenues, distributions, and expenditures of the Mississippi Trauma Care Systems Fund.

The Legislature created the state's trauma care system to "reduce the death and disability resulting from traumatic injury." Participants in the state's trauma care system are the Department of Health, the department's Trauma Care Advisory Committee, the seven trauma care regions and their boards of directors, hospitals that have qualified as trauma centers, a burn center, and emergency medical services providers. State law requires the Department of Health to develop the Trauma Care System Plan, which guides the system, and to develop regulations for the system. Data for the system is maintained in a statewide trauma registry.

MISS. CODE ANN. Section 41-59-5 (1972) requires every Mississippi licensed acute care facility to participate in the statewide trauma care system. Facilities are designated as Level I-IV trauma centers based on specific criteria, including the services each facility offers.[24] As of September 24, 2012, seventy-eight in-state hospitals, one in-state burn center, and two out-of-state hospitals were participating in the Mississippi trauma care system.[25]

All facilities in the trauma care system, except Level I trauma centers, are required by regulation and the Trauma Care System Plan to have transfer agreements in place with higher-level facilities to expedite and facilitate the transfer of patients in need of a higher level of care. Transfer agreements are also in place for specialty care patients such as burn and pediatric patients.

Any hospital that chooses not to participate in the trauma care system or that participates at a level lower than the level at which it is capable of participating, as determined by the Department of Health, must pay a non-participation

[24]Level I trauma centers have the greatest amount of clinical services to handle trauma cases on a twenty-four-hour per day, seven-day per week basis; Level IV trauma centers have only basic emergency medicine services.

[25]University of South Alabama Hospital in Mobile, AL, and the Regional Medical Center at Memphis in Memphis, TN, provide Level I care for transferred patients.

fee as required by the *Mississippi Trauma Care System Regulations.*

Sources of Revenues for the Trauma Care Systems Fund

The Legislature established the Mississippi Trauma Care Systems Fund for use by the Department of Health in the administration and implementation of a comprehensive state trauma care plan. The fund receives revenues from assessments and fees related to vehicles, penalties assessed against hospitals that choose not to participate in the state's trauma care system, and interest on the investment of the fund.

From FY 2009 through FY 2012, the Trauma Care Systems Fund received approximately $101 million in revenues, including:

- approximately $76.4 million from assessments (i. e., on moving traffic violations; speeding, reckless, and careless driving;) and fees (i. e., vehicle license tags; certain distinctive license plates; point-of-sale fees on all-terrain vehicles, and motorcycles);
- approximately $17 million from non-participation fees from hospitals; and,
- approximately $7.5 million in other revenues, including interest income, returns of funds disbursed in prior years, and a transfer of funds from a State Treasury fund closed by the Legislature.

Distribution of Money from the Trauma Care Systems Fund

From 1998 to 2008, the Department of Health used the Trauma Care Systems Fund to cover administrative expenses of the state trauma system, with the remaining balance distributed to participating trauma centers based on their provision of uncompensated care to patients. Beginning in FY 2010, the department continued to use the fund to cover administrative expenses of the system, but distributed the remaining balance in a formulated manner based on each hospital's specific designation as a trauma center.

Initially, the Department of Health distributed funds to hospitals that voluntarily participated in the state's trauma care system on the basis of their provision of uncompensated care to trauma patients. In its 2007 session, the Legislature created a Trauma Care Task Force to determine adequate funding requirements for the system. In 2008, the task force recommended a different method for distributing monies from the Trauma Care Systems Fund to trauma care regions, trauma centers, and emergency medical services providers.

Since FY 2010, the Department of Health has distributed monies in the Trauma Care Systems Fund to hospitals in a formulated manner based on each hospital's designated

trauma center level and the populations served by the emergency medical services providers in each trauma care region. (See pages 19 through 24 of the report for a description of the fund distribution method.)

During FY 2010 through FY 2012, the department distributed approximately $74 million from the fund to emergency medical services providers, trauma centers, and the Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital in Brandon.

Allowable Expenditures from Trauma Care Systems Fund Distributions

Board of Health regulations specify the types of expenditures that emergency medical services providers and trauma centers may make from their Trauma Care Systems Fund distributions.

Departmental regulations allow emergency medical services providers to expend their distributions primarily on employee compensation, training, and equipment related to trauma care. The regulations require Level I-III trauma centers and the burn center to expend 30% of their distributions on physicians' compensation, while the remaining 70% may be expended on other staff compensation, training, commodities, and equipment. All expenditures for Level I-III trauma centers must be related to the care of trauma patients.

Each Level IV trauma center receives an annual stipend and educational grant for its participation in the state's trauma care system. Such funds are intended to assist the Level IV trauma centers in covering administrative costs associated with entering data in the trauma registry and other trauma-related activities.

In FY 2010 through FY 2012,[26] emergency medical services providers and trauma centers expended approximately $50.6 million from the Trauma Care Systems Fund. The Department of Health has not yet audited these expenditures and has not required the burn center to provide expenditure information regarding its FY 2012 distribution.

[26] Expenditures for FY 2012 include only expenditures for the first of two fund distributions—i. e., they do not represent a full year of expenditures.

Monitoring of Trauma Care System Performance

After establishing performance measures for the trauma care system, the Department of Health utilizes state, regional, and hospital-based committees to monitor and evaluate the performance of the state's trauma care system.

State law charges the Department of Health with developing and administering trauma regulations that include, in part, "trauma care system evaluation and management." In order to monitor the effectiveness of the system, the department has established a performance improvement program. The goals of the department's performance improvement program are to:

- alleviate unnecessary death and disability from trauma by reducing inappropriate variations in care and improving patient care practices; and,
- promote optimal trauma care by performing ongoing cycles of evaluation of trauma care delivery and system components and implementing improvement initiatives based on optimal care practices when indicated.

The Department of Health utilizes performance improvement committees at the state, regional, and hospital levels to monitor the performance of the state's trauma care system.

Since 2000, the number of Mississippi's trauma-related deaths has remained fairly constant (a 14% increase), even though trauma-related injuries have risen significantly (a 196% increase). While factors such as motorcycle and bicycle helmet laws, seatbelt laws, and improved medical knowledge and technology have arguably played a role in controlling the number of trauma deaths, the percentage increase in trauma-related deaths from 2000 to 2010 in relation to the percentage increase in trauma-related injuries seems to indicate that the system has been effective in providing trauma care and reducing the number of deaths from trauma-related injuries.

Recommendations

1. The Department of Health should immediately begin auditing Trauma Care Systems Fund distributions that have been made to trauma regions, trauma centers, and EMS providers since FY 2010. In addition to auditing the data entered into the state's trauma registry, the department should review regions' and trauma centers' financial records to

verify the accuracy of expenditure information submitted on the semi-annual applications.

2. The Department of Health should require the Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital to submit the same type of expenditure information required of Level I-Level III trauma centers.

Appendix B: Health Care Facilities in Mississippi's Trauma Care System, by Trauma Center Level, as of February 5, 2013

Trauma Center, By Level	Location
Level I	
University of Mississippi Medical Center	Jackson, MS
University of South Alabama	Mobile, AL
Regional Medical Center at Memphis	Memphis, TN
Le Bonheur Children's Hospital[27]	Memphis, TN
Level II	
Forrest General Hospital	Hattiesburg, MS
Memorial Hospital of Gulfport	Gulfport, MS
North Mississippi Medical Center	Tupelo, MS
Singing River Hospital	Pascagoula, MS
Level III	
Anderson Regional Medical Center	Meridian, MS
Baptist Memorial Hospital – DeSoto	Southaven, MS
Baptist Memorial Hospital – Golden Triangle	Columbus, MS
Baptist Memorial Hospital – North Mississippi	Oxford, MS
Biloxi Regional Medical Center	Biloxi, MS
Central Mississippi Medical Center	Jackson, MS
Delta Regional Medical Center	Greenville, MS
Garden Park Medical Center	Gulfport, MS
Magnolia Regional Health Center	Corinth, MS
Ocean Springs Hospital	Ocean Springs, MS
OCH Regional Medical Center	Starkville, MS
River Oaks Hospital	Flowood, MS
Rush Foundation Hospital	Meridian, MS
South Central Regional Medical Center	Laurel, MS
Southwest Mississippi Regional Medical Center	McComb, MS
Level IV	
Alliance Healthcare System	Holly Springs, MS
Baptist Medical Center	Carthage, MS
Baptist Memorial Hospital – Booneville	Booneville, MS
Baptist Memorial Hospital – Union County	New Albany, MS

[27] The Department of Health has designated Le Bonheur Children's Hospital in Memphis, TN, as a pediatric trauma center.

Bolivar Medical Center	Cleveland, MS
Calhoun Health Services	Calhoun City, MS
Covington County Hospital	Collins, MS
Crossgates River Oaks Hospital	Brandon, MS
Field Memorial Community Hospital	Centreville, MS
Franklin County Memorial Hospital	Meadville, MS
George County Hospital	Lucedale, MS
Greene County Hospital	Leakesville, MS
Greenwood Leflore Hospital	Greenwood, MS
Grenada Lake Medical Center	Grenada, MS
H.C. Watkins Memorial Hospital	Quitman, MS
Hancock Medical Center	Bay St. Louis, MS
Highland Community Hospital	Picayune, MS
Holmes County Hospital and Clinics	Lexington, MS
Jefferson Davis Community Hospital	Prentiss, MS
John C. Stennis Memorial Hospital	DeKalb, MS
King's Daughters Hospital – Yazoo County	Yazoo City, MS
King's Daughters Medical Center – Brookhaven	Brookhaven, MS
Laird Hospital	Union, MS
Lawrence County Hospital	Monticello, MS
Madison River Oaks Medical Center	Canton, MS
Magee General Hospital	Magee, MS
Marion General Hospital	Columbia, MS
Montfort Jones Memorial Hospital	Kosciusko, MS
Natchez Community Hospital	Natchez, MS
Natchez Regional Medical Center	Natchez, MS
Neshoba County General Hospital	Philadelphia, MS
North Mississippi Medical Center – Eupora (previously Webster Health Services)	Eupora, MS
North Mississippi Medical Center – Iuka	Iuka, MS
North Mississippi Medical Center – Pontotoc	Pontotoc, MS
North Mississippi Medical Center – West Point	West Point, MS
North Oak Regional Medical Center	Senatobia, MS
North Sunflower County Hospital	Ruleville, MS
Northwest Mississippi Regional Medical Center	Clarksdale, MS
Noxubee General Critical Access Hospital	Macon, MS
Patient's Choice Medical Center of Humphreys County	Belzoni, MS
Pearl River County Hospital	Poplarville, MS
Perry County General Hospital	Richton, MS
Pioneer Community Hospital of Aberdeen	Aberdeen, MS
Pioneer Community Hospital of Newton	Newton, MS
Pioneer Community Hospital of Choctaw	Ackerman, MS
Quitman County Hospital	Marks, MS
River Region Health System	Vicksburg, MS
S.E. Lackey Memorial Hospital	Forest, MS
Scott Regional Hospital	Morton, MS
Simpson General Hospital	Mendenhall, MS
South Sunflower County Hospital	Indianola, MS
St. Dominic Jackson Memorial Hospital	Jackson, MS
Stone County Hospital	Wiggins, MS
Tippah County Hospital	Ripley, MS
Tri Lakes Medical Center	Batesville, MS

Tyler Holmes Memorial Hospital	Winona, MS
Walthall General Hospital	Tylertown, MS
Wayne General Hospital	Waynesboro, MS
Winston Medical Center	Louisville, MS
Burn Center	
Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital[28]	Brandon, MS

SOURCE: Mississippi Department of Health.

[28]The Joseph M. Still Memorial Burn Center at Crossgates River Oaks Hospital is affiliated with the Joseph M. Still Burn Center, Inc., in Augusta, Georgia, the largest burn care facility in the United States.

Appendix C: Mississippi Hospitals Categorized as Non-Designated and Non-Participating in the Trauma Care System, as of February 5, 2013

Non-Designated Hospitals[29]	
Jefferson County Hospital	Fayette, MS
Patient's Choice Medical Center of Claiborne County	Port Gibson, MS
Sharkey – Issaquena Community Hospital	Rolling Fork, MS
Tallahatchie General Hospital	Charleston, MS
Non-Participating Hospitals[30],[31]	
Gilmore Memorial Regional Medical Center	Amory, MS
Hardy Wilson Memorial Hospital	Hazlehurst, MS
Mississippi Baptist Medical Center	Jackson, MS
Trace Regional Hospital	Houston, MS
Wesley Medical Center	Hattiesburg, MS

SOURCE: Mississippi Department of Health.

[29] A *non-designated hospital* is a licensed acute care hospital that that has applied for designation as a trauma center, but has not been designated by the Department of Health.

[30] A *non-participating hospital* is a licensed acute care hospital that has informed the Department of Health that it does not desire to participate in the trauma care system or a hospital that does not have a current designation or application for designation on file with the department.

[31] Choctaw Health Center in Philadelphia, MS, is also a non-participating hospital, but since the hospital is operated by the Mississippi Band of Choctaw Indians on reservation lands, it is not required to participate in the Mississippi trauma care system due to the sovereign character of the Mississippi Band of Choctaw Indians.

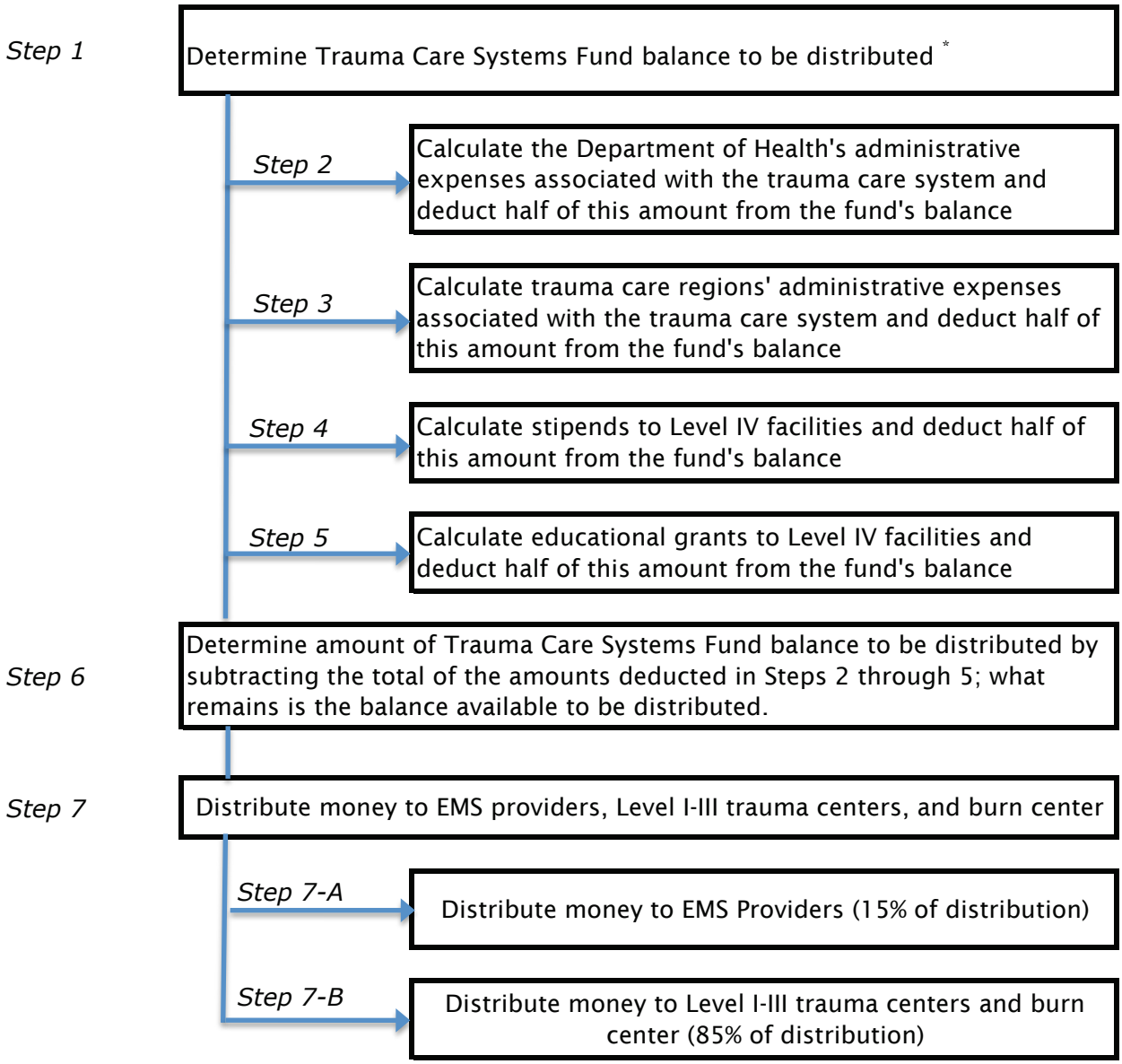
Appendix D: Performance Indicators for the Mississippi Statewide Trauma System Performance Improvement Program

In an August 2012 meeting, the State Trauma Performance Improvement Subcommittee established the following measures of performance for monitoring and evaluating trauma centers:

- number of patient deaths occurring within twenty-four hours of transfer to a Level I-III trauma center;
- number of unexpected deaths occurring at Level I-III trauma centers with a trauma score/injury severity score of less than .5;
- emergency department length of stay for transfers of patients from Level III-IV trauma centers;
- emergency department length of stay for transfer of pediatric patients from all centers to tertiary pediatric centers;
- number of deaths occurring in Level IV trauma centers;
- time from emergency medical services dispatch to patient arrival at an emergency room;
- EMS delivery of a patient to a Level IV center and transfer to a trauma center with a higher level of care; and,
- number of transferred patients from a Level III or Level IV trauma center with a CT scan.

SOURCE: Department of Health programmatic records.

Appendix E: Trauma Care Systems Fund Distribution Method Since FY 2010



*According to Department of Health regulations, on or about April 1 and October 1 of each year (or at such other times as the State Health Officer may direct), the department's Trauma System Administrator obtains a report from the State Treasurer showing the balance of the Trauma Care Systems Fund.

SOURCE: *Mississippi Trauma Care System Regulations*.

Appendix F: Breakdown of Revenue by Source for the Trauma Care Systems Fund, FY 2009 through FY 2012

Source of Revenue	FY 2009	FY 2010	FY 2011	FY 2012	Total
Recurring Revenue					
Traffic Violation Assessments	$7,481,207	$8,401,551	$7,938,109	$7,438,953	$31,259,820
License Tag Issuance and Renewal Fees	7,843,864	11,187,828	10,205,172	10,451,772	39,688,636
Distinctive License Tag Fees	561,316	0	0	887,792	1,449,108
ATV/Motorcycle Fees	1,016,475	995,365	942,723	1,076,452	4,031,015
Sub-total statutory fees/assessments	$16,902,862	$20,584,744	$19,086,004	$19,854,968	$76,428,579
Non-Participation Fees	$4,589,000	$4,923,500	$3,742,000	$3,742,000	$16,996,500
Interest Earned	167,554	228,508	84,832	64,216	545,109
Total Recurring Revenue	**$21,659,416**	**$25,736,752** [1]	**$22,912,836**	**$23,661,184**	**$93,970,187**
Non-recurring Revenue					
Transfer from Other Funds	$4,500,000 [2]	$0	$0	$0	$4,500,002
Returns of Prior Year Disbursements	338,653	1,228,087	855,901	83,622	2,506,263
Total Non-recurring Revenue	**$4,838,653**	**$1,228,087**	**$855,901**	**$83,622**	**$7,006,265**
Total Revenue	**$26,498,069**	**$26,964,839**	**$23,768,737**	**$23,744,806**	**$100,976,453**

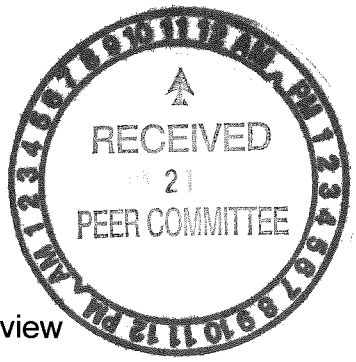
1) In response to the governor's FY 2010 budget cut, the Department of Health transferred $4 million from the Trauma Care Systems Fund to the state General Fund.

2) During the 2009 Regular Session, the Legislature authorized the Department of Finance and Administration to dissolve the medical malpractice insurance fund and transfer the $4,500,000 balance to the Mississippi Trauma Care Systems Fund.

SOURCE: Mississippi State Department of Health financial and programmatic information.

Agency Response

MISSISSIPPI STATE DEPARTMENT OF HEALTH



June 18, 2013

Max K. Arinder, PhD
Executive Director
Joint Committee on Performance Evaluation and Expenditure Review
P.O. Box 1204
Jackson, Mississippi 39215

Dear Dr. Arinder,

The response to the recommendations listed in the PEER report entitled *Improving Mississippi's Trauma Care System: Opportunities and Limitations* is attached for your review.

The professional demeanor, attention to detail, and courtesy extended by your staff, especially the lead evaluator, Mr. Matthew Holmes, during this review was greatly appreciated by the Trauma System staff.

If you should have questions, please feel free to contact me or Norman Miller, PhD, Trauma System Administrator at 601-576-8095.

Sincerely,

Mary McCurrier

Mary Currier, MD, MPH
State Health Officer

ENCL

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Response to PEER Committee report: Improving Mississippi's Trauma Care System: Opportunities and Limitations

Recommendations:

1. *The Mississippi Trauma Advisory Committee (MTAC) and the Department of Health should analyze trauma center coverage and emergency medical services coverage in the state. Based on this analysis, MTAC and the Department of Health should develop strategies to target coverage gaps in the trauma care system and a timeline for improving such coverage.*

   MTAC and the Department will continue their strategic planning activities, including gap analysis, started in October 2010 at the first MTAC Strategic Planning session. This recommendation will also be an agenda item for the next scheduled MTAC meeting.

2. *The Department of Health should periodically determine Mississippi's total cost of trauma care, specifically that portion that is considered to be uncompensated trauma care. The department should also develop and submit to the Legislature alternatives for funding to address more sufficiently the state's uncompensated trauma care costs.*

   The MTAC Rules and Regulations Sub-committee established a task force to determine the cost of trauma in the state of Mississippi. The task force chairman is the past chairman of the Mississippi Hospital Association's (MHA) Trauma Committee and is working with MHA to develop and distribute a survey to all hospitals to determine the cost of operation of a trauma center, as well as the cost of uncompensated trauma care.

3. *MTAC and the Department of Health should continue their efforts of analyzing the current Trauma Care Systems Fund distribution, with a goal of providing additional funding to Level IV trauma centers.*

   The Trauma Finance Task Force, referenced above, is reviewing the current Trauma Care Trust Fund distribution process, both for hospitals and EMS providers, and seeking alternative methods of distribution. Additionally, the Partial Capability Task Force is reviewing the requirements for designation as a Trauma Center with less than 24 hour coverage of required physician specialties.

PEER Committee Staff

Max Arinder, Executive Director
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Ted Booth, General Counsel

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