

STATE OF MISSOURI

A REASSESSMENT OF EMERGENCY MEDICAL SERVICES

June 22-24, 2010

**National Highway Traffic
Safety Administration
Technical Assistance Team**

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BACKGROUND

Injury is the leading cause of death for persons in the age group one through 44 as well as the most common cause of hospitalizations for persons under the age of 40. The financial costs of injuries are staggering: injuries cost billions of dollars in health care and social support resources. In 1995, for example, the lifetime costs of all injuries were estimated at \$260 billion annually. These estimates do not include the emotional burden resulting from the loss of a child or loved one, or the toll of severe disability on the injured person and his or her family. Each year over 37,000 people lose their lives on our nation's roads, and approximately 70 percent of those fatalities occur on rural highways. The National Highway Traffic Safety Administration (NHTSA) is charged with reducing death and injury on the nation's highways. NHTSA has determined it can best use its limited resources if its efforts are focused on assisting States with the development of integrated emergency medical services (EMS) programs which include comprehensive systems of trauma care.

To accomplish this goal, in 1988 NHTSA developed a Technical Assistance Team (TAT) approach which permitted states to utilize highway safety funds to support the technical evaluation of existing and proposed emergency medical services programs. Following the implementation of the Assessment Program, NHTSA developed a Reassessment Program to assist those states in measuring their progress since the original assessment. The Program remains a tool for States to use in evaluating their statewide EMS programs. The Reassessment Program follows the same logistical process, and now uses the same ten component areas plus the area of preparedness with updated standards. The standards now reflect current EMS philosophy and allow for the evolution into a comprehensive and integrated health management system, with regional accountable systems of care, as identified in the 2006 IOM Report on the Future of Emergency Care. NHTSA serves as a facilitator by assembling a team of technical experts who demonstrate expertise in emergency medical services development and implementation. These experts demonstrate leadership and expertise through involvement in national organizations committed to the improvement of emergency medical services throughout the country. Selection of the Technical Assistance Team is also based on experience in special areas identified by the requesting State. Examples of specialized expertise include experience in the development of legislative proposals, data gathering systems, and trauma systems. Experience in similar geographic and demographic situations, such as rural areas, coupled with knowledge in providing emergency medical services in urban populations is essential.

The Missouri Department of Health and Senior Services requested the assistance of NHTSA. NHTSA agreed to utilize its technical assistance program to provide a technical reassessment of the Missouri Statewide EMS program. NHTSA developed a format whereby the Bureau of EMS (BEMS) staff coordinated comprehensive briefings on the EMS system.

The TAT assembled in Jefferson City, Missouri on June 22-24, 2010. For the first day and a half, over 25 presenters from the State of Missouri, provided in-depth briefings on EMS and trauma care, and reviewed the progress since the 1994 Assessment. Topics for review and discussion included the following:

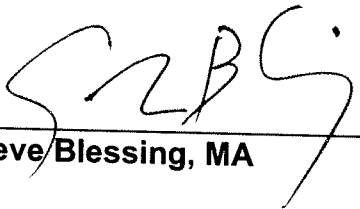
General Emergency Medical Services Overview of System Components

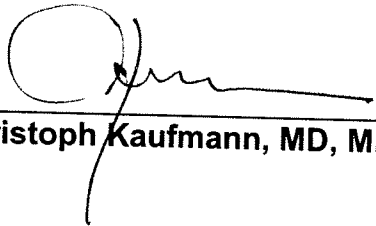
- Regulation and Policy
- Resource Management
- Human Resources and Education
- Transportation
- Facilities
- Communications
- Trauma Systems
- Public Information and Education
- Medical Direction
- Evaluation
- Preparedness

The forum of presentation and discussion allowed the TAT the opportunity to ask questions regarding the status of the EMS system, clarify any issues identified in the briefing materials provided earlier, measure progress, identify barriers to change, and develop a clear understanding of how emergency medical services function throughout Missouri. The team spent considerable time with each presenter so they could review the status for each topic.

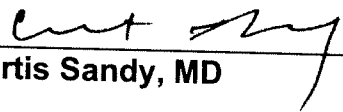
Following the briefings by presenters from the Missouri BEMS, public and private sector providers, and members of the medical community, the TAT sequestered to evaluate the current EMS system as presented and to develop a set of recommendations for system improvements. When reviewing this report, please note the TAT focused on major areas for system improvement.

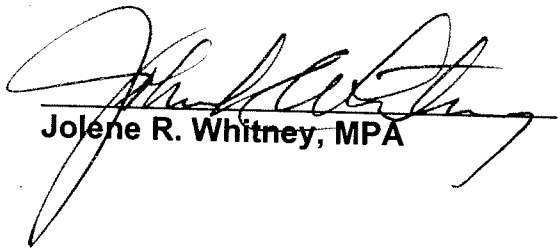
The statements made in this report are based on the input received. Pre-established standards and the combined experience of the team members were applied to the information gathered. All team members agree with the recommendations as presented.


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ACKNOWLEDGMENTS

The Technical Assistance Team (TAT) would like to acknowledge the Missouri Bureau of EMS (BEMS) for their support in conducting this assessment and The Missouri Foundation for Health for supporting the assessment process.

The TAT would like to thank all of the presenters for being candid and open regarding the status of EMS in Missouri. Each presenter was responsive to the questions posed by the TAT which aided the reviewers in their evaluation. Many of these individuals traveled considerable distance to participate.

Special recognition and thanks go to Dr. Samar Muzaffar, State EMS Medical Director and Greg Natsch, Chief, BEMS and his staff and all the briefing participants for their extraordinary efforts and well-prepared presentations.

INTRODUCTION

In 1821 Missouri became the 24th American state. Born of a territory in the center of what would become a large nation and in the exact middle of the sequence that joined together 50 states, Missouri is the true American crossroads. In the 1800s, Missouri played host to countless pioneers who used her as the gateway to western expansion of the American dream, and along the way collected up those who came from all over and found their dream here instead of further west. Missouri is a state of great vision and innovation, and the home to many who have made their mark on the world. It is a true reflection of our great nation as a whole.

Missouri's EMS system is a reflection of the diverse and complex state it serves. The system has numerous strengths to its credit. Chief among them is the strong commitment of its leadership, agencies and providers, and their willingness to move forward in search of an even greater future, just as the pioneers did two centuries earlier. Missouri EMS has risen to the challenges posed by several natural disasters and provided great care for its citizenry as well as its many neighbors in the surrounding states. It is well on the way to establishing a bold improvement in the care for its citizens with the development of its statewide Time Critical Diagnosis (TCD) System for Trauma, Stroke, and STEMI. This system was envisioned by the late Dr. Bill Jermyn, and supported by a broad stakeholder group culminating in the passage of this first in the nation law authorizing a time critical diagnosis system of care. The State must make a commitment that data collection and analysis, medical direction, training and trauma care receive significant support during the regionalization process. This is not a nod to competitive interest, but an acknowledgement that the bold efforts of Missouri to develop regionalization will rise or fall on these key system components.

Like every other EMS system, there are still opportunities for improvement. The EMS system in Missouri is focused primarily on the local perspective. This focus has served the system well over the years, but now the system is at a crossroads. Regionalized systems of care require the focus to shift to a statewide perspective. Regionalization is not consolidation. It is rather a cooperative approach to using effective force multipliers and synergy to create system achievements that cannot be accomplished alone. These achievements save lives and improve care for those who are sick or injured. This approach requires a change in thinking and demands the trust and commitment of all who are involved.

Building and maintaining excellence requires a significant commitment of resources and time. Missouri is up for the challenge. This is demonstrated through the high level of interest shown by multiple presenters and attendees over the past two days. Through careful and complete system planning, Missouri can develop statewide systems of care and empower its regional structure to describe, refine and improve the delivery of EMS care.

Policymakers and citizens must make a financial commitment to further develop data collection, dispatch, medical direction, trauma system development, training and communications. Emergency Medical Services must be integrated more fully into the overall healthcare system of Missouri and EMS must be recognized at all points in the continuum of care as a true health profession. The payoff for Missouri will be exponentially measured in the number of lives saved and a corresponding savings in healthcare costs.

MISSOURI BUREAU OF EMERGENCY MEDICAL SERVICES (BEMS)

The TAT revisited the ten essential components of an optimal EMS system that were used in the Missouri: *An Assessment of Emergency Medical Services*, in 1994. These components provided an evaluation or quality assurance report based on ten standards. While examining each component, the TAT identified key EMS issues, reviewed the State's progress since the original report, assessed its status, and used the eleven 2009 Reassessment Standards as the basis for recommendations for EMS system improvement.

A. REGULATION AND POLICY

Standard

Each State should embody comprehensive enabling legislation, regulations, and operational policies and procedures to provide an effective state-wide system of emergency medical and trauma care and should:

- Establish the EMS program and designate a lead agency;
- Outline the lead agency's basic responsibilities and authorities including licensure and certification including the designation of emergency medical services regions;
- Require comprehensive EMS system planning;
- Establish a sustainable source of funding for the EMS and trauma system;
- Require prehospital data collection which is compatible with local, State and national efforts such as the National EMS Information System (NEMSIS) and evaluation;
- Provide authority to establish minimum standards related to system elements such as personnel, services, specialty care facilities and regional systems and identify penalties for noncompliance;
- Provide for an injury/trauma prevention and public education program; and
- Integrate the special needs of children and other special populations throughout the EMS system;
- Integrate pediatric EMS needs into State statutes, rules and regulations.

All of these components, which are discussed in different sections of this guideline, are critical to the effectiveness of legislation, regulations or policies/procedures which are the legal foundation for a statewide EMS system.

Status

The Bureau of EMS (BEMS) resides in the Health Standards and Licensure Section of the Regulation and Licensure Division of the Missouri Department of Health and Senior Services. It is responsible for implementing Chapter 190 (190.001 – 190.245) of the Missouri Revised Statutes and Division 30, Chapter 40 (Titles 19 CSR 30-40.045 – 30-40.600) rules of the Department of Health and Senior Services. The Statutes, collectively, are titled the “Comprehensive Emergency Medical Services Systems Act”.

The Bureau of EMS is identified by the Department as the lead agency for the

management of the EMS system for the State of Missouri. While specific language denoting the Department's and Bureau's role in implementing a comprehensive EMS system is not identified in statute, there is clear evidence of the Department's efforts to accomplish these activities.

The statutory and regulatory responsibilities of the Department are specific and detailed, and cover most aspects of a contemporary EMS system. Specifically, the statutes require:

- The establishment of ambulance districts;
- The establishment of a State advisory board;
- Outline the power and duties of regional medical directors;
- The establishment of a pediatric EMS system;
- Licensing of ground and air ambulances;
- Certification of EMS training programs;
- Licensing of ALS emergency medical response agencies;
- Licensing of emergency medical technicians;
- Establishing a data collection system;
- Designating trauma, STEMI and stroke centers;
- Developing transportation protocols dealing with trauma, stroke and STEMI; and
- Establishing a peer review system.

The statutes were recently augmented to require the Department to implement a time critical diagnosis (TCD) system inclusive of designation of specialty hospitals to care for individuals suffering from trauma, stroke and myocardial infarction and transportation protocols to ensure that patients are appropriately transported to these specialty hospitals. The Department is involved in writing the accompanying rules at this time.

Notably, the statutes do not include language that:

- Charges the Department with the responsibility to establish and enhance a statewide EMS system;
- Provides specific protection from discoverability of EMS data used for peer review activities;
- Delegates any regulatory authority for the establishment or enhancement of the EMS system to the regional councils.

Additionally, no regulations were written to implement the Pediatric EMS system identified in statute.

Personnel

Missouri, like most states, has suffered from a decline in revenues during the current recession. The review team heard many references to Missouri being a 'low tax-low service' state. Consequently, over the past 16 years, the Bureau of EMS has gone from

a staff of 25 to a staff of 10. While the regulatory changes that took place in 1998 reduced the work requirements of the Bureau, current staffing requires all staff be trained to perform multiple tasks and all individuals share multiple responsibilities in order to meet current workload. The State EMS Medical Director position was created as a result of the efforts to implement the time critical diagnosis system and is funded by the Missouri Foundation for Health. At this time, this key position is located in the Director's office. Additional staff positions will be required to implement this system. The Trauma System Manager and EMS for Children positions were left vacant following the death of the employee that performed those functions. The new Trauma Nurse/EMS-C Coordinator has been hired and will start in early August.

Funding

Funding to support BEMS staff comes from several sources including general revenue, the federal Public Health Block Grant, the Federal Emergency Medical Services for Children grant program, the Heart Disease and Stroke Prevention program and the Missouri Foundation for Health.

Additional funding for programmatic activities has been received from the Office of Rural Health and the Center for Emergency Response and Terrorism. Grant applications have been submitted to the Missouri Departments of Transportation and Homeland Security.

Statutory language requires the Department to establish fees for licensure services, but previous efforts to promulgate rules were stopped due to opposition.

None of the funding sources identified for staff or program activities is secure. The Missouri Foundation for Health funding for the EMS Medical Director's position will end in 2012 and the imminent passage of the time critical diagnosis system regulations will require additional staffing.

Recommendations

- **The stakeholder community should work to pass legislation to specifically describe the role of the Department of Health and Senior Services as the agency charged with implementing and enhancing the EMS system within the State of Missouri;**
- The stakeholder community should work to pass legislation giving authority to the Department of Health and Senior Services to develop an inclusive quality improvement process for EMS systems, including TCD specialty hospitals;
- **DHSS should propose legislation to ensure that EMS patient care data is protected from discoverability, and agencies, facilities and their personnel are protected from legal or regulatory action that may arise from the peer review process;**
- The stakeholder community should work to pass legislation allowing the Department to delegate specific authorities to the regional EMS committees relating to system assessment, quality improvement and system planning;
- The Department should introduce enabling legislation to allow the Missouri regional EMS committees to become not for profit corporations including the ability to compete for grant funding;
- The Department should promulgate regulations that integrate national standards for pediatric EMS care within the Missouri EMS system;
- The Department should work with the Department of Public Safety and the stakeholder community to pass legislation and/or promulgate rules to establish minimum standards for emergency medical dispatch centers;
- The Department should reintroduce rules regarding licensing fees;
- **The Department should formalize the State EMS Medical Director position within the organizational structure and adopt a position description based on national professional organization guidelines.**

B. RESOURCE MANAGEMENT

Standard

Each State EMS lead agency should identify, categorize, and coordinate resources necessary for establishment and operation of regionalized, accountable EMS and trauma systems. The lead agency should:

- Maintain a coordinated response to day-to-day emergencies as well as mass casualty events or disasters and ensure that resources are used appropriately throughout the State;
- Have policies and regulations in place to assure equal access to basic emergency care for all victims of medical or traumatic emergencies;
- Provide adequate triage, including trauma field triage, and transport of all victims by appropriately certified personnel (at a minimum, trained to the emergency medical technician [EMT] level) in properly licensed, equipped, and maintained ambulances;
- Provide transport to a facility that is appropriately equipped, staffed and ready to administer to the needs of the patient including specialty care hospitals (section 4: Transportation);
- Appoint an advisory council, including pediatric EMS representation, to provide broad-based input and guidance to the state EMS system and to provide a forum for cooperative action and for assuring maximum use of resources; and
- Coordinate with State Highway Safety Agency and other State Agencies in the development of the Strategic Highway Safety Plan to ensure that EMS system information is used to evaluate highway safety problems and to improve post-crash care and survivability.

Status

BEMS provides oversight at the state level to the extent that providers and ambulance services are licensed and periodically inspected. Service areas and the actual level of care provided is determined locally through the use of a system of ambulance districts, each independently operated and governed by a designated board. Although it appears that coverage for all parts of the state is provided adequately, there is a noticeable lack of centralized coordination at the state level, and it appears difficult at the state level to actually determine the extent of coverage and the level of care in a specific area of the state at any given moment. Most licensed ambulance services (98%, 210 out of 215) have some ALS capability. There remain concerns about adequate ALS coverage in remote areas of the state. Missouri is divided into six EMS regions, which are helpful in coordination of response and EMS resource management, but regional committees lack authority or oversight capacity and function only in an advisory role. The net effect is that Missouri appears to have an EMS confederation rather than an EMS System.

In the event of mass casualty incident (MCI) or disaster situations, Missouri has a plan to accommodate a need for a surge in personnel, equipment, and supplies. There are MCI caches located throughout the state that provide equipment and supplies during a mass care event. Exercises are conducted in each region to test the region's response to a mass care event.

Trauma hospitals are included in response planning in each region, however each region does not have the same level of trauma capabilities and a mass casualty event in some regions of the state will quickly overload local resources. There is a noticeable absence of real time capability to fully monitor resources and response at the state level. Coordinated response may at times be further hindered by a patchwork system of 911, where local dispatch and monitoring capabilities vary from state of the art in some jurisdictions, to non-existent in others.

Lack of centralized coordination of EMS assets at the state level and the practice of determining EMS coverage through local ambulance districts makes it virtually impossible to assure that the citizens of Missouri receive equal access to emergency care. There are obvious needs in some jurisdictions that lead to disparities in the delivery of EMS care and create underserved populations or geographic areas.

Efforts to address disparities in EMS care are led by DHSS, which is in the process of establishing statewide trauma, stroke and STEMI field triage and transport protocols to be incorporated into regulation. The stroke and STEMI field triage and transport

protocols have been drafted as a proposed regulation for filing by the first of 2011. The trauma field triage and transport protocol is based on the trauma field triage decision scheme published by the Centers for Disease Control and Prevention in 2009. Most EMS stakeholders are already united behind these protocols, which must be embraced by all to create a forward moving system. Statewide protocols are an absolute imperative in the development of an inclusive statewide EMS system.

Other glaring issues that impede development of a comprehensive statewide EMS system are the lack of a statewide EMS plan, and data reporting to the state EMS Bureau that is less than optimum. The policy of submitting only the "life threat" reports to the Bureau, based on 1998 guidance for the Missouri Ambulance Reporting Form at the time, is woefully inadequate. A new State minimum data set from all EMS patient care reports in the state must be submitted in a NEMSIS compliant electronic format in order to provide adequate monitoring and coordination of the state's EMS resources and improvements in care delivery.

A strength of the Missouri EMS system is the interaction and cooperation between the BEMS and the Office of Highway Safety. It is clear that cooperation exists and there are obvious signs of collaboration on projects that benefit both agencies. Further success can be achieved by continued collaboration and regular communication. The BEMS also collaborates with the Office of Rural Health, however there may be new opportunities to work together to improve EMS care in rural areas.

Perhaps one of the greatest strengths in the Missouri EMS system is the State Advisory Council (SAC)-EMS, which meets ten times a year. The SAC and its task-organized subcommittees bring together a diverse, talented and highly motivated core of experts to address trauma, pediatrics, medical direction, communications, public information, legislation, air transport and EMS education. Moving forward, it is important that SAC maintain a committed and focused leadership role in developing a better coordinated and modern statewide EMS system.

Recommendations

- **DHSS should require all EMS patient care reports to be submitted to BEMS. The Bureau must develop a minimum data set and method to adequately monitor and measure statewide EMS performance;**
- DHSS should consider the linkage of EMS data with its CODES project and other TCD databases and also use EMS patient care reports for syndromic surveillance;
- BEMS should include representation from the Office of Highway Safety on its trauma systems committee and SAC-EMS subcommittees, where appropriate and seek additional opportunities to collaborate with the Office of Rural Health;
- **DHSS should work through SAC-EMS to develop and implement a comprehensive statewide EMS plan. The plan should ensure and develop an inclusive system of care for the emergency healthcare system (Trauma, STEMI, Stroke and others as appropriate), to include all patients, providers, agencies and hospitals. The plan should also develop a rigorous statewide QA/QI program.**

C. HUMAN RESOURCES AND EDUCATION

Standard

Each State should ensure that its EMS system has essential trained and certified/licensed persons to perform required tasks. These personnel include: first responders (e.g., police and fire), prehospital providers (e.g., emergency medical technicians and paramedics), communications specialists, physicians, nurses, hospital administrators, and planners. Each State should provide a comprehensive statewide plan for assuring a stable EMS workforce including consistent EMS training and recruitment/retention programs with effective local and regional support. The State agency should:

- Ensure sufficient availability of adequately trained and appropriately licensed EMS personnel to support the EMS system configuration;
- Assure an ongoing state EMS personnel needs assessment that identifies areas of personnel shortage, tracks statewide trends in personnel utilization and which establishes, in coordination with local agencies, a recruiting and retention plan/program;
- Establish EMT as the state minimum level of licensure for all transporting EMS personnel;
- Routinely monitor training programs to ensure uniformity, quality control and medical direction;
- Use standardized education standards throughout the State that are consistent with the National EMS Education Standards;
- Ensure availability of continuing education programs, including requirements for pediatric emergency education;
- Require instructors to meet State requirements;
- Assure statutory authority, rules and regulations to support a system of EMS personnel licensure that meets or exceeds the national EMS Scope of Practice Model, new National Education Standards, as they are available, and other aspects of the EMS Education Agenda for the Future; and
- Monitor and ensure the health and safety of all EMS personnel.

Status

The Bureau is charged with licensing the approximately 17,000 EMTs in the State of Missouri. All EMTs must have NREMT certification to be eligible for the five year initial or relicensing period in the state. Each EMT must undergo a background check and no individual can be denied a license without an informal conference with the Bureau Chief and representative from the Office of the General Counsel.

The DOT National Standard Curricula have been adopted as the standard for all First Responder and EMT education in Missouri and the state has adopted the DOT Scope of Practice Model as the floor for respective levels of licensure. Each agency's medical director is responsible for determining the actual protocols and ceiling for the scope of practice. All ambulances in Missouri are required to be staffed with two EMTs with an exception for volunteer ambulance services, which may use a first responder to drive the vehicle.

BEMS conducts site visits at least once during each training program's five year licensing period to ensure compliance with state requirements. Currently, Missouri's NREMT pass rates are well below the national average. Beginning in 2009, any licensed training programs whose students do not meet the national first-attempt pass rate for NREMT are subject to progressive technical assistance from the Bureau.

Similarly, an ambulance service is licensed for five years. BEMS staff make at least one visit during that period to ensure that quality improvement initiatives are being undertaken and to review patient care reports to ensure that treatment and equipment are consistent with that agency's protocols. In the event that the inspector identifies discrepancies, they have the ability to perform a more thorough analysis that may require consultation with the agency's service director and medical director.

The Bureau has facilitated technical assistance for training programs seeking accreditation from CoAEMSP and staff anticipates no difficulties in making changes to regulations to accommodate the new EMT nomenclature, scope of practice and education standards that will take effect in January 2013.

The Bureau, with financial assistance, has supported two annual pediatric conferences that were well attended and planning for a third conference is underway. Continuing education for EMTs must be CECBEMS approved.

The state has not performed an assessment to determine if there are adequate EMS providers and has received only sporadic reports of shortage of personnel.

Recommendations

- The Department should perform a work force analysis to determine the impact of reducing the license period for EMTs, training programs and training program staff from five years to three years and then present the findings to the State Advisory Council for recommendations;
- The Bureau should develop a technical assistance program to be distributed to training programs based upon best practices from training programs with high first attempt pass rates;
- The Bureau should prioritize the regulatory changes necessary to accommodate changes to EMT nomenclature, scope of practice and education standards that will occur in January 2013.

D. TRANSPORTATION

Standard

Each State should require safe, reliable EMS transportation. States should:

- Develop statewide EMS transportation plans, including the identification of specific EMS service areas and integration with regionalized, accountable systems of emergency care;
- Implement regulations that establish regionalized, accountable systems of emergency care and which provide for the systematic delivery of patients to the most appropriate specialty care facilities, including use of the most recent Trauma Field Triage Criteria of the American College of Surgeons/Committee on Trauma;
- Develop routine, standardized methods for inspection and licensing of all emergency medical transport services and vehicles, including assuring essential pediatric equipment and supplies;
- Establish a minimum number of personnel at the desired level of licensure on each response and delineate other system configuration requirements if appropriate;
- Assure coordination all emergency transports within the EMS system, including public, private, or specialty (air and ground) transport and including center(s) for regional or statewide EMS transportation coordination and medical direction if appropriate; and
- Develop regulations to ensure ambulance drivers are properly trained and licensed.

Status

Throughout Missouri, transportation for routine emergencies is assured by licensing ambulances for respective geographic service areas. The BEMS intends to utilize GIS capabilities for mapping of the ambulance service areas to ensure complete service coverage. According to regulations, licensed ambulances may develop mutual aid agreements with neighboring services to ensure coverage in times of high demand or disaster response. Twenty-five percent of the services are fire based with the majority of ambulance service being provided by ambulance service districts.

As of this date, there are 214 ground ambulance services, 15 air ambulance providers and 35 Emergency Medical Response Agencies (EMRA). There are 6 services that provide Basic Life Support. Approximately, 98% of the licensed ambulance services

provide at least partial ALS service within their respective geographic service areas. Ambulance services also respond to requests for interfacility transfers within their geographic service areas. There are no standardized licensing or staffing requirements for critical care ground transports, and geographic service limitations have impeded the development of a practical ground-based alternative to air transport.

Because of BEMS personnel limitations, ambulance service licenses were set for a five year period starting in 1998. BEMS no longer conducts annual inspections for every vehicle. However, BEMS conducts midterm inspections with all licensed ambulance agencies. As stated by the BEMS, an audit is not considered punitive but utilized for the BEMS and service to review compliance with licensing requirements. Operational criteria of the services are also audited for compliance. Equipment for ambulance services is determined by the service manager and medical director to adequately meet the needs of the population they serve. Inspectors are trained through the Council of Licensure Enforcement and Regulation (CLEAR).

The Comprehensive EMS Act of 1998 established licensure for Emergency Medical Response Agencies. These are non-transporting units providing Advanced Life Support staffed with a minimum of one paramedic. Additional licensure requirements include a mandate for all ambulance services and EMRAs to have a physician medical director to establish triage, treatment and transport protocols. All ground services must have transport protocols which are approved by the BEMS and local medical director.

There appears to be sufficient authority for the BEMS to regulate ground and air ambulances through statute and regulations. Licensed ambulance services, by statute, may not discriminate regarding treatment or transportation for emergency patients. Missouri statute requires that severely injured patients must be transported to a trauma center. Triage and transports guidelines are currently under development. Careful consideration should be given to mode of transport, particularly to the potential impact of the TCD system on air ambulance utilization.

Minimum ambulance staffing is set in regulations and statute for both ground and air ambulances. Comprehensive standards within 19-CSR 30-4-.308 provide for the operations and licensing of air ambulances including medical components of personnel, equipment, operations and training. Also within the statute are clearly defined standards for the operations and licensing of ground ambulances. Ambulance services must also assure that the vehicle drivers have received vehicle operations training and must maintain driver education records.

BEMS is to be commended for its efforts to develop a recognition program for ambulance services meeting requirements for carrying pediatric equipment. They are also to be commended for their acceptance and promotion of national accreditation standards for various aspects of EMS, such as the Commission on Accreditation of Ambulance Services (CAAS), the Commission on Accreditation of Medical Transportation Services (CAMTS) and the National Academy of Emergency Medical

Dispatch (NAEMD).

In 1978, Missouri had one air ambulance service. Today, they have 15 licensed providers with 45 aircraft located throughout the state. These aircraft sufficiently provide coverage to the entire state within a 30 minute radius. For the past 20 years the air ambulance industry has become saturated as air services compete for volume. It was reported that fierce competition and the lack of oversight and regulation could lead to compromising patient care and safety. Starting in 2000, air ambulance services regularly met to address industry issues. The meetings resulted in comprehensive air ambulance regulations, development of an air ambulance subcommittee of SAC, education programs regarding early launch and a guideline for closest air response. As a result of the federal Airline Deregulation Act of 1978 and the related Missouri legal ruling, the regulations are limited to staffing, equipment and medical operations for air ambulances.

With the passage of recent legislation, much energy has been devoted to the establishment of an emergency health care system for trauma, stroke and STEMI patients. However, it was reported that the biggest transportation issue pertains to the transport of psychiatric patients and the availability of resources to manage these patients, especially in rural areas.

Recommendations

- **The Bureau should finalize a minimum statewide standard for trauma triage, treatment and transport protocols for licensed EMS agencies;**
- The Bureau should support 100% compliance for the national EMSC performance measure requiring pediatric equipment for all licensed ambulances;
- The Bureau should move forward with plans to map the ambulance service districts and ambulance services to ensure comprehensive coverage and accurate service area descriptions;
- The Bureau should establish minimum licensing standards for First Responder (EMR) personnel and agencies;
- **The Bureau should implement a fee schedule, with stakeholder input, for licensing ambulance services to cover costs associated with the regulatory duties required of the BEMS;**
- DHSS should convene a multi-disciplinary workgroup, including mental health professionals, to determine opportunities for improvement and methodologies for addressing the transportation and care of psychiatric patients.

E. FACILITIES

Standard

It is imperative that the seriously injured (or ill) patient be delivered in a timely manner to the closest appropriate facility. Each State should ensure that:

- Both stabilization and definitive care needs of the patient are considered;
- There is a statewide and medically accountable regional system, including protocols and medical direction, for the transport of patients to state-designated specialty care centers;
- There is state designation of specialty medical facilities (e.g. trauma, burns, pediatric, cardiac) and that the designation is free of non-medical considerations and the designations of the facilities are clearly understood by medical direction and prehospital personnel;
- Hospital resource capabilities (facility designation), including ability to stabilize and manage pediatric emergencies, are known in advance, so that appropriate primary and secondary transport decisions can be made by the EMS providers and medical direction;
- Agreements are made between facilities to ensure that patients, including pediatric patients, receive treatment at the closest, most appropriate facility, including facilities in other states or counties;
- Hospital diversion policies are developed and utilized to match system resources with patient needs – standards are clearly identified for placing a facility on bypass or diverting an ambulance to appropriate facilities.

Status

Missouri encompasses a tremendous breadth of population densities. As such, the capabilities of its hospitals are also quite variable. These facilities range from world-class medical centers in the largest cities to critical access hospitals in some rural areas. Many counties do not have even one hospital.

Missouri designates trauma centers as Level I, Level II, or Level III using a voluntary process. The verification criteria are loosely modeled after the most recent American College of Surgeons trauma center standards. Currently, efforts are underway to codify Level IV trauma center standards.

Efforts are made to use out-of-state trauma center site reviewers for verification of Level I and II centers. The Level III verification process utilizes in-state reviewers. The current review cycle is five years. Three adult Level I trauma centers in the State are verified by the American College of Surgeons.

There are 28 designated trauma centers in the State: 10 Level I's (including 3 pediatric Level I's), 11 Level II's, and 7 Level III's. Until recently there were 8 Level III's – one center dropped its designation for reasons of call coverage. Eight burn centers provide care to Missouri citizens, but none is designated by the State. There is no dedicated funding source to offset the cost of uncompensated trauma care within Missouri.

Missouri trauma centers provide care to many trauma victims who live in the surrounding eight states. There are no State-to-State repatriation agreements for these patients, although at least two neighboring states (IL and AR) do provide some compensation to hospitals providing trauma care to their citizens.

Each of the six EMS regions contains at least one Level I or Level II trauma center, except for the Southeast region. This region has a Level III trauma center that is prevented from becoming a Level II center because of neurosurgery backup call issues. Availability of rehabilitation beds does not appear to be a large problem in Missouri.

As the State works towards implementation of a Time Critical Diagnosis (TCD) based EMS system, plans are being made for categorization of hospitals as regards their individual capacity to provide timely care for victims of stroke or STEMI. It is expected that this model will be applied later to additional time critical conditions. Currently, telemedicine technologies are not widely used across the State.

Recommendations

- BEMS should complete criteria for Level IV trauma centers and implement;
- BEMS should complete criteria for appropriate categorization of STEMI and stroke centers;
- BEMS should increase frequency of trauma center verification visits to once every three years (a national standard);
- **DHSS should require submission of trauma patient care data to the State Trauma Registry from all licensed acute care facilities. This data submission requirement should be extended to stroke and STEMI patients at the appropriate time;**
- BEMS should mandate and inspect for transfer agreements between Level III and (later) Level IV trauma centers with a regional Level I or II. Similarly, transfer agreements should be in place at each facility for special populations: children, burns, and spinal cord injury;
- **DHSS should secure a reliable funding source to maintain BEMS office infrastructure and to offset uncompensated trauma patient care provided at designated trauma centers;**
- BEMS should develop a process for burn center designation and verification, or use the American Burn Association/ACS joint process;
- **BEMS and SAC-EMS should develop and implement a strategy to ensure that each citizen is served by a Level I or Level II trauma center within his/her EMS region. Assist the Southeast Region Level III with overcoming obstacles to achieving Level II designation;**
- DHSS and the Office of Rural Health should apply telemedicine technology to TCD opportunities, as possible, to extend the physicians' reach to all areas of the State;
- BEMS and the Office of Rural Health should integrate Critical Access Hospitals in planning and implementation of TCD EMS strategies, policies, and care.

F. COMMUNICATIONS

Standard

An effective communications system is essential to EMS operations and provides the means by which emergency resources can be accessed, mobilized, managed, and coordinated. Each State should assure a comprehensive communication system to:

- Begin with the universal system access number 911;
- Strive for quick implementation of both wire line and wireless enhanced 911 services which make possible, among other features, the automatic identification of the caller's number and physical location;
- Strive to auto-populate prehospital patient care report (NEMSIS compliant) with all relevant times from the public safety answering point (PSAP);
- Provide for emergency medical dispatch training and certification for all 911 call takers and EMS dispatcher.
- Provide for priority medical dispatch;
- Provide for an interoperable system that enables communications from dispatch to ambulance, ambulance to ambulance, ambulance to hospital, hospital to hospital and ambulance to public safety communications.
- Provide for prioritized dispatch of EMS and other public safety resources.
- Ensure that the receiving facility is ready and able to accept the patient; and
- Provide for dispatcher training and certification standards.
- The statewide communications plan includes effective, reliable interoperable communications systems among EMS, 911, emergency management, public safety, public health and health care agencies.
- Each State should develop a statewide communications plan that defines State government roles in EMS system communications.

Status

There is a universal 911 number in Missouri; however, implementation of the 911 system is fragmented. There are 91 counties in Missouri that have implemented 911 systems. Six counties are in the process of implementing the system and seventeen counties only provide a ten digit number for emergency medical calls. The obstacles for further implementation of the 911 system in these counties appear to be related to a perception that it is not needed and to a lack of available funding. Wireless and E911 coverage is also not consistently or readily available throughout Missouri. Again, local perception for need and funding are the major deterrents for further implementation and the lack of unified state oversight has contributed to local disparities.

Notably, DHSS collaborated with the Office of Homeland Security to improve coordination of the 911 system at the state level. This effort provided immediate results, allowing DHSS to send out mass messages to dispatch centers during their response to the H1N1 incident.

The emergency medical dispatch system has 96 independent dispatch centers located throughout Missouri. No regulations require these 911 centers to provide emergency medical dispatch (EMD). This results in disparities in the timeliness and quality of EMS care.

Centers that choose to provide pre-arrival instructions for 911 calls must have a medical director and a memorandum of understanding with each ambulance service they dispatch. The medical director is responsible for reviewing medical priority protocols and standards to administer the protocols. Additionally, those dispatch centers choosing to provide pre-arrival instructions are required to meet education and skill competencies for their patient care environment. There are no licensing standards for emergency medical dispatchers established in rule. However, state regulations were updated to require EMD training entities to meet or exceed National Academy of EMD training standards. The Bureau and SAC should be commended for raising the standard.

The Missouri Highway Patrol has established an interoperable communications plan. Through a memorandum of understanding, law enforcement, fire, EMS and local health departments can utilize this system which enables them to have a common frequency for tactical response. DHSS can also access the system through their CPU interface. It was reported that EMS does not have one statewide frequency for all ambulance providers and hospitals to facilitate communications and coordination of patient transports.

Many resources from the ASPR Hospital Preparedness Program grant have improved the communications capabilities for hospitals. The implementation of the EMS system has enabled hospitals to report bed status, resource needs, and the need for ambulance diversion. The DHSS Department Situation Room personnel continuously

monitor EMSsystem. The review is conducted on an hourly basis to search for patterns. The state utilizes the Health Alert Network for event notification. In addition to EMSsystem, the state utilizes E-Team for incident management.

There appear to be opportunities to enhance communications capabilities for EMS agencies through these disaster preparedness tools but centralized coordination will be required.

Recommendations

- **DHSS and DPS should establish statutory authority to require the use of emergency medical dispatch and establish minimum standards for all medical dispatch centers, and their staff, which provide 911 medical dispatch ;**
- DHSS and DPS should establish state emergency medical dispatcher licensing standards;
- The DHSS and DPS should collect fees associated with personnel licensure and compliance inspections for dispatch centers;
- DHSS should continue its collaborative efforts with DPS to resolve issues regarding fragmentation of the Missouri 911 system;
- **The Bureau should conduct an assessment of the state EMS communications system to support the statewide interoperability communication plan;**
- 911 centers should be required to monitor EMSsystem to optimize deployment of EMS resources;
- DHSS should work with DPS and other agencies to pursue legislation and funding for implementation of "Phase 2 E-911" (FCC).

G. PUBLIC INFORMATION AND EDUCATION

Standard

Public awareness and education about the EMS system are essential to a high quality system. Each State should implement a public information and education (PI&E) plan to address:

- The components and capabilities of an EMS system;
- The public's role in the system;
- The public's ability to access the system;
- What to do in an emergency (e.g., bystander care training);
- Education on prevention issues (e.g., alcohol or other drugs, occupant protection, speeding, motorcycle and bicycle safety);
- The EMS providers' role in injury prevention and control; and
- The need for dedicated staff and resources for PI&E.

Status

The BEMS has no dedicated staff for injury prevention or public information and education activities. However, within DHSS, the Community and Public Health Office of Injury Prevention is engaged in numerous prevention activities. They have established a coalition of stakeholders and are working on an injury prevention plan. They also oversee contracts for nine local Safe Kids coalitions to conduct primary injury prevention interventions. Funding from the Maternal and Child Health Block Grant also supports the ThinkFirst Missouri program.

The Injury and Violence Prevention Program (IVPP) completed a STIPDA (Safe States) assessment and have established strategies to meet the recommendations. Many injury prevention activities are also administered and coordinated by the Chief of the Bureau of Genetics and Healthy Childhood, in the Division of Community and Public Health.

The state has another rich resource to be utilized for injury prevention. The Office of Epidemiology and Health Informatics, within DHSS, is actively collecting data and engaged in surveillance activities. The Missouri Information for Community Assessment

(MICA) is a DHSS database available to the public and healthcare providers. Users can run various reports associated with the leading causes of death and injury in Missouri which can help focus injury prevention strategies. The data from MICA is regularly utilized to publish reports for the public and policymakers. However, it appears to be underutilized by hospitals and EMS agencies.

Locally, hospitals and EMS providers are involved with injury prevention activities as well. Many programs are related to helmet use and seatbelts. Several regions have focused efforts on all terrain Vehicles (ATVs) and motor vehicle crashes (MVCs).

Through the Time Critical Diagnosis System, Public Education Work Group, a public education campaign is being developed to increase awareness for the importance of calling 911 and to promote the TCD system. The implementation of this system is timely and provides an opportunity to educate the public about EMS system access.

It was reported that there are no bystander care training programs implemented by the Bureau or Department. Interest was expressed in providing funding through the ASPR grant to support bystander care training for the public. This effort would greatly enhance capabilities, especially in rural areas, where medical resources are limited. Mass casualty incidents in rural areas can quickly overwhelm resources. Trained citizens in basic lifesaving techniques may be a great asset throughout the state, especially in rural Missouri.

Recommendations

- The Bureau should collaborate with the IVPP to further EMS injury prevention activities;
- The Bureau should collaborate with the Hospital Preparedness Program to implement a bystander care training program for the public;
- **DHSS should utilize data and resources available through the State Office Of Epidemiology and the State Highway Safety Office to support the passage of a primary seatbelt law;**
- The Bureau should continue to utilize DHSS resources to develop regular media messages to promote and educate the public and policy-makers about the EMS system, and the prevalence of illness and injury, and respective interventions;
- The Bureau should engage EMS providers in becoming more involved with public education and injury prevention programs;
- The Department should provide a forum on the website for hospitals and EMS agencies to report injury prevention projects, best practices and program effectiveness results;
- **The Bureau should enhance collaboration and seek funding opportunities with the Office of Highway Safety to develop injury prevention strategies targeting death and disability from traffic crashes.**

H. MEDICAL DIRECTION

Standard

Physician involvement in all aspects of the patient care system is critical for effective EMS operations. EMS is a medical care system in which physicians oversee non-physician providers who manage patient care outside the traditional confines of the office or hospital. States should require physicians to be involved in all aspects of the patient care system, including:

- A state EMS Medical Director who is involved with statewide EMS planning, overseeing the development and modification of prehospital treatment protocols, statewide EMS quality improvement programs, scope of practice and medical aspects of EMS provider licensing/disciplinary actions;
- On-line and off-line medical direction for the provision of all emergency care including pediatric medical direction, when needed and the authority to prevent and EMS provider from functioning based on patient care considerations; and
- Audit and evaluation of patient care as it relates to patient outcome, appropriateness of training programs and quality improvement.

Status

Missouri has a State EMS Medical Director within the Office of the Director of Health and Senior Services. This position is not established in statute and is funded by the Missouri Foundation for Health. The State EMS Medical Director provides leadership and coordination of the Emergency Medical Care System, which includes the Time Critical Diagnosis System for trauma, STEMI, and stroke. There is no authority for development of treatment protocols or a statewide quality improvement program.

There are 6 Regional Medical Directors established in statute that serve in an advisory capacity to the Regional Advisory Committees. These medical directors also compose the Medical Direction Subcommittee of the State Advisory Committee.

All ambulance services and emergency medical response agencies are required to have a medical director responsible for approving licensed personnel for response and for development of protocols for treatment, triage and transport, do not resuscitate (DNR), and air ambulance utilization. The medical director is also responsible for determining medication and medical equipment utilized by the agency. The medical director is required to have board certification in emergency medicine or active practice in emergency medicine with primary care or surgery board certification and certified in ACLS, ATLS and PALS. There is no requirement for EMS specific training, though the

State is beginning to provide training seminars for medical directors. There is no state certification for EMS medical directors. Certification in PALS is the only pediatric-specific requirement. Agency medical directors have the authority to restrict or limit an individual provider's practice within the agency. The agency medical director is responsible for determining the scope of practice for EMTs and paramedic providers.

The provision of quality improvement and monitoring of patient outcomes has been delegated to the individual agency level and agency medical director. EMS agencies are required to submit NEMSIS information on "life-threat" calls only which make up less than 10% of the call volume. "Life-threat" is not defined in rule and is up to individual agency interpretation.

Each agency is required to have access to on-line medical direction with no specific training criteria for the physicians providing this on-line medical direction. With no standardized scope of practice or treatment protocols for ALS agencies, on-line medical direction has potential to be problematic due to this variability.

Recommendations

- **The Department should establish the position of the State EMS Medical Director with appropriate funding;**
- **The Department should pursue legislation to provide authority for the State EMS Medical Director to oversee the development of statewide quality improvement and system performance indicators, treatment protocols, and provider licensure issues;**
- **The Bureau should develop comprehensive agency EMS Medical Director training and medical director certification. This includes specific training for on-line medical direction;**
- The Legislature should establish in statute liability protection for medical directors' medical and administrative liability;
- The Bureau should establish specific statewide standards for quality improvement regarding low volume/high risk procedures, e.g. RSI, surgical cricothyroidotomy, thrombolytic administration;
- The Bureau should require pediatric- specific on-line and off-line medical direction and increased pediatric training requirements for both on-line and off-line medical direction;
- The Regional Medical Director's role should be expanded to provide authority for oversight of regional QA activities including compliance with treatment and transport protocols.

I. TRAUMA SYSTEMS

Standard

Each State should maintain a fully functional trauma system to provide a high quality, effective patient care system. States should implement legislation requiring the development of a trauma system, including:

- Trauma center designation, using American College of Surgeons Committee on Trauma guidelines as a minimum;
- Trauma field triage and transfer standards for trauma patients;
- Data collection and trauma registry definitions for quality assurance, using American College of Surgeons Committee on Trauma National Trauma Data Standards, as soon as practicable;
- Systems management and quality assurance; and
- Statewide Trauma System Plan, consistent with the Health Resources and Services Administration Model Trauma System Planning & Evaluation Document.

Status

The Missouri trauma system was established and continues to exist due to the hard work of medical professionals and the BEMS staff. The trauma centers comprising the trauma system hospital base are committed to providing excellent care to the injured citizens of Missouri and its surrounding states. However, there is little funding to support this critical healthcare delivery infrastructure – much of the ongoing work to maintain the system is performed on a volunteer basis. It is this lack of sustainable funding that poses the greatest threat to the Missouri trauma system.

There are currently 28 designated trauma centers within this fragile system: 10 Level I's (including 3 pediatric Level I's), 11 Level II's, and 7 Level III's. Each of the 6 EMS regions has at least one Level I or one Level II, except the Southeast region. Examination of injury death rates by county demonstrates that the Southeast region has the largest concentration of counties with the highest death rates (2000-2006 data CDC WISQARS). This is a geographic area of opportunity as regards improving trauma care in Missouri.

Other geographic areas of the state also provide opportunities for trauma system improvement. Scrutiny of American Trauma Society Trauma Information and Exchange Program (TIEP) data maps show that only 48% of the land area of Missouri is within 60 minutes of a Level I or Level II trauma center by ground or air transport. Eighty-four

percent of the population, however, is within 60 minutes of a Level I or II trauma center (TIEP 2009 maps of trauma center access).

Trauma system design, implementation, and monitoring can be quite challenging in a large state with both urban and rural areas. The six EMS regions provide an excellent start to improving the quality of trauma care in Missouri. These regions were based on historic patient referral patterns and are thus naturally suited to development of regional trauma plans. These regional plans can then serve either as the foundation for, or components of, a state trauma plan. In each region there are excellent hospitals, some already designated as trauma centers. There are also a cross-section of dedicated medical professionals and agencies. The missing resource is financial support. Each region needs enough funding to develop and implement a regional trauma plan, collect data, and perform quality improvement/system development.

The data needs of a first-rate inclusive trauma system are substantial. These data include prehospital EMS data, ED data, inpatient data, discharge data, and rehabilitation data. These data must be reported to a central repository and reports generated that provide the facts necessary to examine system performance. Trauma system performance includes not only death rates and times to definitive care, but many additional measures too numerous to list. Scrutiny of trauma system data drives system refinement – changes in triage protocols, addition of resources, additional transfer agreements, etc. Statewide data evaluation is needed, as some patients will be transferred across EMS region borders. Establishing statewide trauma field triage and transfer standards is an appropriate first step.

The state trauma registry thus plays a critical role in trauma system performance and development. Without reporting of all trauma patients from all acute care facilities across the State, there will be an incomplete understanding of the trauma public health problem in Missouri. Without complete knowledge of the problem, the solutions proposed and interventions made will be suboptimal, at best – perhaps even detrimental to future trauma patient care.

Although the novel TCD strategy is economically advantageous for overall EMS system development, the TCD strategy puts trauma system completion at some risk. Given limited workforce and time, emerging focus on STEMI and stroke may relegate trauma system development to a lower priority status. There are a limited number of people who have time to volunteer to further develop the regional and statewide inclusive trauma system. It would be unfortunate should they become frustrated and lose interest. One option would be to complete the trauma component of the TCD-based system before current momentum is lost.

The goal of an inclusive trauma system for Missouri is achievable. To have each hospital participate commensurate with its resources and capabilities is the true goal. To be able to collect and properly analyze data from each injured person from time of injury through rehabilitation will afford the opportunity to provide optimal care for all, in

the most cost-effective manner.

A financial investment in Missouri regional and state trauma system maturation now will not only save additional lives and protect an important healthcare delivery system, but will ensure efficiency and optimal resource utilization in the future.

Recommendations

- **BEMS should immediately hire a full-time State Trauma System Manager. An experienced trauma nurse would optimally fill this position.**
- **BEMS should complete a statewide inclusive trauma system plan and empower the EMS regions to implement the plan. This statewide plan should be inclusive of all facilities (including critical access hospitals) and inclusive of all data pertaining to each injured patient transported to an acute care facility.**
- **BEMS should promulgate statewide trauma field triage and transfer standards.**
- **The State legislature should provide sustained adequate funding to maintain the BEMS office, the State EMS Medical Director position, and develop and maintain EMS regional advisory committees. Additional funding sources should be identified and funds provided to participating trauma centers to offset the cost of uncompensated trauma care.**
- BEMS should routinely provide periodic trauma system reports to prehospital agencies, all participating hospitals, regional advisory committees, the legislature, and other constituents.
- BEMS should work towards the goal that all citizens of Missouri are within 60 minutes of a Level I or Level II trauma center (by ground or air transport). [See American Trauma Society TIEP: 2009 Maps of Trauma Center Access.]
- The American College of Surgeons Missouri State Committee on Trauma members should take leadership roles in trauma system development activities and work towards acquiring additional trauma care funding, as has been accomplished in other states.
- BEMS should conduct a BIS (HRSA, MTSPE: benchmark, indicators, and scoring) self-assessment to determine appropriate early focus to prioritize next steps in trauma system development.

J. EVALUATION

Standard

Each State should implement a comprehensive evaluation program to assess effectively and to improve a statewide EMS system. State and local EMS system managers should:

- Evaluate the effectiveness of services provided to victims of medical or trauma-related emergencies;
- Define the impact of the system on patient care and identify opportunities for system improvement;
- Evaluate resource utilization, scope of service, patient outcome, and effectiveness of operational policies, procedures, and protocols;
- Evaluate the operation of regional, accountable emergency care systems including whether the right patients are taken to the right hospital;
- Evaluate the effectiveness of prehospital treatment protocols, destination protocols and 911 protocols including opportunities for improvement;
- Require EMS operating organizations to collect NEMSIS compliant data to evaluate emergency care in terms of the frequency, category, and severity of conditions treated and the appropriateness of care provided; Assure protection from discoverability of EMS and trauma peer review data;
- Ensure data-gathering mechanism and system policies that provides for the linkage of data from different data sources through the use of common data elements;
- Ensure compatibility and interoperability of data among local, State and national data efforts including the National EMS Information System and participation in the National EMS Database;
- Evaluate both process and impact measures of injury prevention, and public information and education programs; and
- Participate in the State Traffic Records Coordinating Committee (TRCC) – a policy-level group that oversees the State’s traffic records system, to develop and update a Statewide Traffic Records System Strategic Plan that ensures coordination of efforts and sharing of data among various State safety data systems, including EMS and Trauma Registry data.

Status

The State does not have a comprehensive EMS system evaluation process in place. The function of system evaluation has been left to the individual agency to develop and monitor without state minimum performance standards. This process is limited however, because of the lack of protection from legal discovery for peer-review activities. EMS is currently pursuing an agreement with the Center for Patient Safety to facilitate peer review protections for these QI activities. Unfortunately the development of this patient safety organization (PSO) has potential to complicate the statewide evaluation process due to desire by some providers to only report patient care data to the PSO and not to the Bureau. The Bureau recognizes the importance of system evaluation and intends to focus on the Time Critical Diagnosis System performance.

There is a statewide ambulance reporting program (MARS) that is provided free of charge for agency use. Approximately 80% of agencies in the state use this software though there are still paper patient care reports being utilized.

The State collects NEMSIS compliant data only on patients with “life-threats” as defined by the local agency. This severely limits the ability to analyze the true scope of EMS performance across the state. Even with the receipt of limited data, there is no systematic data analysis process in place.

The State has several databases within the Department of Health and Senior Services, Office of Epidemiology and Bureau of Health Informatics. The state is nationally recognized for its electronic vital records information system. These databases include the hospital discharge data as well as an injury database separate from the trauma registry. Future hopes include linking of the hospital discharge data with the crash outcomes data. The Bureau of EMS oversees the trauma registry. There is no full time data manager in the BEMS. While epidemiologists are available, there is no dedicated support for the trauma registry and MARS.

The trauma registry collects data from designated trauma centers. This data is available for reference or report generation but is not actively analyzed and not routinely disseminated. There is no seamless mechanism for tracking patients from the prehospital to inpatient environments, nor to track individual patients flow within the system.

Recommendations

- The Legislature should establish peer-review protection for EMS providers and data;
- **The Bureau should establish a statewide comprehensive EMS system evaluation process to measure EMS performance and outcomes including within the TCD system;**
- **The Bureau should require licensed ambulances services and EMRAs to electronically submit NEMSIS-compliant data on all EMS patient encounters into MARS;**
- The Bureau should require a written patient care report be provided to the receiving hospital upon patient transfer of care;
- The Bureau should evaluate air medical utilization for outcomes and appropriateness of use;
- **The Bureau should establish, as part of the statewide quality improvement plan, specific system quality indicators regarding treatment and agency performance parameters;**
- DHSS should establish a process for evaluation of injury prevention and public education programs;
- The Bureau should establish a mechanism for individual patient identification and tracking through the TCD system and within various state databases including the ability to auto-populate patient tracking system and data registries;
- DHSS should enable the Regional Advisory Committees and Regional Medical Directors to oversee a regional QA program based upon statewide performance indicators;
- The Bureau should routinely provide reports from MARS and the trauma registry to hospitals and EMS agencies regarding performance parameters and outcomes.
- **DHSS should create a full time data management position in the BEMS for Trauma Registry and MARS;**
- The Bureau should request a consultation visit from the NEMSIS Technical Assistance Center.

K. PREPAREDNESS

Standard

EMS is a critical component in the systematic response to day-to-day emergencies as well as disasters. Building upon the day-to-day capabilities of the EMS system each State should ensure that EMS resources are effectively and appropriately dispatched and provide prehospital triage, treatment, transport, tracking of patients and documentation of care appropriate for the incident, while maintaining the capabilities of the EMS system for continued operations, including:

- Clearly defining the role of the State Office of EMS in preparedness planning and response including their relationship with the State's emergency management, public health and homeland security agencies;
- Establishing and exercising a means to allow EMS resources to be used across jurisdictions, both intrastate and interstate, using the Emergency Management Assistance Compact and the National Incident Management System;
- Identifying strategies to protect the EMS workforce and their families during a disaster;
- Written protocols, approved by medical control, for EMS assessment, triage, transport and tracking of patients during a disaster;
- A current statewide EMS pandemic influenza plan; and
- Clearly defining the role of emergency medical services in public health surveillance.

Status

DHSS and BEMS are actively engaged in emergency preparedness planning and response. In recent years, BEMS has moved resources into emergency areas during power outages in St. Louis; ice storms and floods in Southeast Missouri, and hurricanes Katrina, Ike and Gustav. Bureau personnel have been included in preparedness planning and training activities statewide. Bureau personnel are involved in Chempack distribution, the Strategic National Stockpile, and working with the state disaster medical assistance teams (DMAT). Five members of BEMS are assigned to the State Emergency Operations Center (SEOC) as liaisons to the Department of Public Safety and other executive departments.

Bureau personnel have worked in cooperation with leaders in EMS to develop a

statewide EMS mutual aid plan. The plan, based on the state fire mutual aid plan, is being developed with the cooperation of the State Mutual Aid Coordinator from the State Fire Marshall's Office. Additionally, the State EMS Medical Director is working with external partners to develop a simulation-based training program linking trauma practice with multiple and mass casualty preparedness.

The Bureau is the lead state agency for emergency medical services and resource allocation and response to Emergency Management Assistance Compact (EMAC) requests, coordination of FEMA emergency response contracts and coordination with the State Fire Marshall's office.

The Center for Emergency Response and Terrorism within DHSS worked with local agencies throughout the state to provide a number of resources for EMS providers and provider agencies to improve workforce protection.

Written protocols, approved by medical direction, for EMS assessment, triage, transport and tracking of patients during a disaster are developed at the local level. There is a noticeable lack of protocols at the state level, leaving local agencies to their own devices and creating potential coordination issues during major events.

Missouri has adopted the NHTSA pandemic influenza model as a basis for their plan. As part of the Department's pandemic planning in 2009, the State EMS Medical Director and the BEMS Chief were directed to assess and develop EMS specific components for the pandemic influenza plan, and bureau personnel played a key role in response activities related to pandemic influenza.

Missouri EMS benefits from all of the major federal preparedness grants. Despite this, there are still needs to be addressed, especially with respect to communications and interoperability.

There are 17 supply trailers and several communications trailers provided by DHSS for use in disaster situations. PPE is available for EMS provider use as well.

DHSS demonstrates a robust surveillance program. Ongoing surveillance is maintained through the range of required reporting systems that the Department manages. This information is updated annually and made available online through the Department's MICA and community profiles pages. Special reports are prepared, as needed, to inform planning processes or in response to specific requests. Surveillance activities could be greatly enhanced by including full MARS reports from all EMS runs on a real time basis. Variable dispatch capabilities throughout the state impede EMS preparedness efforts. Improved dispatch and EMS communications throughout the state are needed to facilitate better dissemination of information to EMS agencies and to facilitate better coordination and allocation of available EMS assets.

The Missouri Ambulance Reporting System (MARS) cannot be used as a surveillance tool because it only captures a small fraction of the actual number of patient encounters.

There was broad support displayed during the presentations for comprehensive data collection.

Many jurisdictions have patient tracking software and are able to enter patients into a tracking system. It is unclear whether these systems are capable of uploading into hospital or DHSS databases.

Highway patrol and disaster response regions do not match EMS regions. This may complicate organized medical response as well as create obstacles to joint grant funding applications.

Overall, Missouri EMS has demonstrated its ability to prepare for disaster and respond in a timely manner. Refinement of the current capabilities will further improve the health and well being of all Missourians.

Recommendations

- **DHSS should require all EMS patient care reports to be submitted on a real time basis and develop a methodology to include patient care reports in its syndromic surveillance activities;**
- DHSS should consider ways to upload patient care data from the patient tracking system into the state trauma registry as well as a statewide EMS database;
- **DHSS should collaborate with DPS and other state agencies to strengthen and improve communications interoperability for EMS agencies in the field;**
- **DHSS should work with DPS and other state agencies to improve and standardize EMS dispatch capabilities statewide;**
- DHSS should collaborate with the EMS regions to enhance federal grant funding opportunities for local EMS.

L. CURRICULUM VITAE

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ORGANIZATIONS/APPOINTMENTS

President, National Association of State Emergency Medical Services Officials (NASEMSO)
Former East Region Representative, NASEMSO
Former Domestic Preparedness Committee Chair, NASEMSO
Appointee, Delaware Emergency Medical Services Oversight Council
Appointee, Delaware Statewide Interoperability Executive Council
Principal Investigator, Delaware Emergency Medical Services for Children Grant
Member, Delaware Traffic Records Coordinating Council
Member, Delaware Homeland Security Grant Program Steering Committee
Member, Delaware Highway Safety Planning Council
Member, Delaware Crash Outcome Data Evaluation Steering Committee
Member, Delaware Trauma Systems Committee
Member, Atlantic EMS Council
Past member, Committee on Accreditation of Educational Programs for the EMS Professions
USDOT, Technical Assistance Team, Traffic Records Program, Member, State of Minnesota.
USDOT, Technical Assistance Team, EMS Reassessment Program, Member, State of Oklahoma.

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ORGANIZATIONS/APPOINTMENTS

American College of Surgeons Committee on Trauma,
Past Chair, ATLS Subcommittee 2003-2006, International Chair 2006-2009
Trauma Systems Consultation Committee (reviewer NC, CT, HI, Team leader AZ, TN, IN, TX)
Member and Lead Reviewer, Trauma Center Verification & Review Committee (VRC)
Region Chief, Military Region 1999-2002
Trauma Center State Site Surveyor (Virginia, Pennsylvania, Illinois, Washington, Oregon)
Institute of Medicine, Committee on a Vision for Space Medicine Beyond Earth Orbit
NATO Emergency War Surgery Handbook, 3rd US Revision, Editorial Board
American Board of Surgery, Associate Examiner
Ambroise Pare Military Surgical Forum of ISS-SIC, Past President
Society of Apothecaries of London, Diploma in the Medical Care of Catastrophes,
Diplomate and Examiner
Madigan Army Medical Center, Tacoma, Washington, Staff Surgeon,
Surgical Chief, ICU
47th Combat Support Hospital, Saudi Arabia and Iraq, Chief, Trauma Surgery
Inova Fairfax Hospital, Falls Church, Virginia, Vice Chief, Trauma Services
Emanuel Hospital, Associate Medical Director, Trauma Services, 2002-2009
U.S. Public Health Service, Division of Trauma and Emergency Medical Systems,
BHRD, HRSA, Director 1994-1995
Uniformed Services University of the Health Sciences
Professor of Surgery 2002-
Division of Trauma and Combat Surgery, Chief
National Capital Area Medical Simulation Center, Surgical Simulation Laboratory, Director
Oregon Health Sciences University, Clinical Professor of Surgery, 2004-2009
East Tennessee State University, Professor of Surgery, 2009-
Journal of Trauma, Senior Reviewer
Program Committee, Medicine Meets Virtual Reality, 2000-2003
HRSA Ad Hoc Committee to write Model Trauma Care System Plan/MTSPE, 1992/2003
Member, Resources Revision Committee, ACS COT and Contributing Author (Green Book)
Member, Pro Tem, ACS Health Policy Steering Committee
Member, Oregon State Trauma Advisory Board, 2004-2009
USDOT, NHTSA EMS Reassessment Program, Technical Assistance Team, Member,
State of Mississippi, State of North Dakota

Susan D. McHenry, MS

EMS Specialist

U.S. Department of Transportation
National Highway Traffic Safety Administration
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EMS Specialist
DOT, National Highway Traffic Safety Administration
(March 1996 - to Present)

Director, OEMS
Virginia Department of Health
(1976 to March 1996)

ORGANIZATIONS/APPOINTMENTS

National Association of State EMS Directors (1979-1996)
 Past President
 Past Chairman, Government Affairs Committee
National Association of EMS Physicians, Member
American Trauma Society
 Founding Member, Past Speaker House of Delegates
ASTM, Former Member, Committee F.30 on Emergency Medical Services
Institute of Medicine/National Research Council
 Pediatric EMS Study Committee, Member
 Committee Studying Use of Heimlich Maneuver on Near Drowning Victims,
 Member
World Association on Disaster and Emergency Medicine
 Executive Committee, Former Member
Editorial Reviewer for *A Prehospital and Disaster Medicine*, (former).

Terry Mullins, MBA

Chief, Bureau of EMS & Trauma System
Arizona Department of Health Services
Phoenix, Arizona 85007

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ORGANIZATIONS/APPOINTMENTS

Chief of the Arizona Department of Health Services, Bureau of EMS and Trauma System – 4 years

Manager of the Trauma-EMS Technical Assistance Center Manager, Maryland – 4 years

Manager of Great Falls Emergency Medical Services – 3 years

Director of Operations of Missoula Emergency Medical Services – 2 years

Paramedic – 11 years

Contributor and reviewer for:

Model Trauma Systems Planning and Evaluation: Health Resources and Services Administration, February 2006

An Algorithmic Approach to Prehospital Airway Management: Prehospital Emergency Care, February 2005.

USDOT, NHTSA EMS Technical Assistance Team, Reassessment Program, Member, States of, North Dakota and Nevada.

Curtis C. Sandy, MD FACEP

EMS Medical Director
Rocky Mountain Emergency Physicians
Portneuf Medical Center
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Pocatello, ID 83201

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ORGANIZATIONS/APPOINTMENTS

American College of Emergency Physicians (ACEP), Fellow
Immediate Past President, Idaho Chapter, 2009-pres
President Idaho Chapter 2004-2009
President Elect – Idaho Chapter 2003-2004
Councilor - Idaho Chapter 2004-2005
Academic Affairs Committee 2001-2003
Alternate Councilor, Representative Council, Oct 2002
American Board of Emergency Medicine, Diplomate
Emergency Medicine Residents Association (EMRA)
Board of Directors, Academic Affairs, Director, 2001-2003
Board Liaison to the Council of Residency Directors 2001-2003
Board Liaison to the Medical Student Committee of EMRA 2001-2003
Participant in CORE Core Competencies conference, March 2002
National Association of EMS Physicians (NAEMSP)
Air Medical Physician Association (AMPA)
Idaho EMS Physician Commission, Board of Medicine Representative, 2006-pres
Idaho EMS Code Task Force – 2007- pres
Idaho Cardiac Level One Steering Committee 2009 – pres
Medical Director, Bannock County Ambulance/Pocatello Fire, Pocatello, ID 2007- pres
Medical Director, Ft. Hall Fire and EMS, Fort Hall, ID 2007- pres
Medical Director, Bannock County Search and Rescue 2007- pres
Medical Director, Portneuf, Life Flight, Pocatello, ID 2004- pres
Medical Director, BYU-Idaho Paramedic Program, Rexburg, ID 2008- pres
Tactical Physician, Bannock County Sheriff Southeast Idaho STAR, 2008-pres
Assistant Associate Clinical Medical Director, College of Southern Idaho Paramedic
Program, Twin Falls, ID 2004-pres
Idaho State EMS Bureau Air Medical Utilization Task Force 2005
Medical Direction Subcommittee, Idaho EMS Advisory Committee 2005-2006
Affiliate Clinical Faculty: Idaho State University, Department of Family Medicine,
Pocatello, ID, 2003-present.
Consultant, SafeTech Solutions, LLP
USDOT, NHTSA, EMS Reassessment Program, Technical Assistance Team, Member,
State of Oklahoma.

Jolene R. Whitney, MPA

Deputy Director
State of Utah
Department of Health
Bureau of Emergency Medical Services & Preparedness

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ORGANIZATIONS/APPOINTMENTS

Utah Bureau of EMS and Preparedness, Deputy Director
Chair National Council of State Trauma
Systems Managers
NASEMSO liaison for the ACS Trauma System
Planning and Evaluation Executive Committee
NHTSA EMT Refresher Course Curriculum Development
HRSA Rural Trauma Grant Reviewer
Utah Public Health Association, Member
American Trauma Society, Member
Task Force Chair for Utah Trauma System Development
Air Ambulance Rules Task Force, Chair
Appointed to Governor's Council on Blood Services
Previous member of State EMS Training Coordinators Council
CLEAR Certified Inspector
Utah Emergency Managers Association, Member
ACS, State Trauma System Assessment, Team Member, States of Alaska, Minnesota,
Colorado and Louisiana, Texas.
USDOT, NHTSA, EMS Reassessment Program, Technical Assistance Team,
Member, States of Michigan, Oklahoma and Delaware.