



ARKANSAS

TRAUMA SYSTEM

Est. 2009



UPDATE

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I. INTRODUCTION

The Problem

In 2009, injury was the number one killer of Arkansans between the ages of one and 44. Arkansas' overall injury fatality rate was 33% higher than the national average. This problem was exacerbated by Arkansas' rural road system, the twelfth largest in the nation. In addition, in a study conducted by the American College of Emergency Physicians in December 2008, Arkansas was cited as having the worst system of emergency care in the nation. Prior to the passage of the Trauma System Act by the Arkansas Legislature in 2009 (see below), Arkansas was one of three states without a trauma system and the only state without a designated trauma center.

The Solution

Arkansas' new trauma system was authorized by Act 393 (Trauma System Act) of 2009. Funding for the system commenced on July 1, 2009 (Act 1383). The national experience has clearly demonstrated that statewide, comprehensive trauma systems give injured patients the best chance of quickly reaching definitive care and having the best outcomes.

Implementation

The Arkansas Department of Health (ADH) is the agency responsible for implementation of the trauma system. The information below demonstrates the significant progress we have made in making the system a reality.

II. IMPORTANT STATUTES, DOCUMENTS, AND OTHER INFORMATION

As noted above, the trauma system was authorized by Act 393 (Trauma System Act) of 2009. Initial funding for the system began on July 1, 2009 (Act 1383). The ADH's Trauma/Injury and Violence Prevention Branch is the organizational entity responsible for implementing the trauma system. It utilizes a set of administrative/procedural process documents (e.g., hospital designation process) to assist in the execution of its duties. These documents are all located on the ADH website at www.healthy.arkansas.gov.

In addition to statutory authority, the new trauma system was governed by the “*Rules and Regulations for Trauma Systems*”, which were initially promulgated in 2002 and revised in 2009. In order to bring Arkansas in line with the trauma rules set forth by the American College of Surgeons (ACS), new rules were written. The revised rules, known as the *Arkansas Trauma System Rules and Regulations (Rules)*, became effective on September 6, 2014. Both sets of rules were reviewed by appropriate legislative committees and approved by the Arkansas Board of Health. A set of *Frequently Asked Questions* is a “living document” that is frequently updated to provide interpretive guidance concerning the *Rules*. Finally, as noted below in Section III., the Governor’s Trauma Advisory Council plays an important role in the operation of the trauma system.

III. ADVISORY BODIES

Governor’s Trauma Advisory Council (TAC)

The TAC and its seven Committees (Finance, Hospital, Quality Improvement/Trauma Regional Advisory Councils, Injury and Violence Prevention (IVP), EMS, Rehabilitation, and System Outcomes/Evaluation) meet on at least a quarterly basis and furnish valuable guidance to ADH on development of the trauma system. The TAC holds a yearly strategic planning meeting to set goals and objectives for the coming year. This statutorily-mandated 26-member committee of experts is invaluable to the success of the system.

Trauma Regional Advisory Councils (TRACs)

There are seven TRACs throughout Arkansas. All meet routinely to address local needs such as injury and violence prevention and other issues such as performance/quality improvement. All participating hospitals, EMS providers and other local stakeholders are active on these councils. Each TRAC receives funding in the amount of \$10,000 for trauma-related activities (total of \$70,000 for all seven TRACs). In addition, each TRAC’s IVP Committee receives \$20,000 (total of \$140,000 for all seven TRACs) to be used for this purpose. Each TRAC has its own medical director.

IV. MAJOR SYSTEM COMPONENTS

1. Trauma Centers

Trauma Center Designation

The purpose of the designation process is to ensure that trauma centers have the appropriate personnel, equipment, training, and other elements in place for the optimal care of injured patients. At this time there are 68 hospitals that have been designated as trauma centers within the Arkansas Trauma System. The breakdown by levels is as follows:

- Level I (provides comprehensive clinical care and is a community resource; i.e., has education, research, and outreach components): 6
- Level II (provides comprehensive clinical care at a slightly reduced degree than that provided at a Level I center): 6
- Level III (provides treatment for mild and moderate single system injuries; most traumatic injuries can be treated at a Level III facility): 18
- Level IV (provides stabilization for severely injured patients; transfer to a higher level trauma center is usually required): 38

It is noted that certain out-of-state hospitals are included in the Arkansas trauma system due to the number of Arkansas trauma patients treated at these hospitals. These trauma centers are located in Memphis, Tennessee; Springfield, Missouri; Tulsa, Oklahoma; and, Texarkana, Texas. They all have the capability and capacity to treat Arkansas patients and are located in such proximity to our state that they are often the preferred destination for our injured patients.

Funding for In-state Trauma Centers

For FY 2016, in-state trauma centers at the various levels will receive (i.e., on a reimbursable basis) the following amounts:

- Level I trauma centers: \$1,000,000
- Level II trauma centers: \$500,000
- Level III trauma centers: \$125,000
- Level IV trauma centers: \$25,000
- (note: funding for out-of-state trauma centers is based on a formula that indexes the number of Arkansas trauma patients seen at these facilities against the number of these patients seen at Arkansas trauma centers of the same level – the formula takes a weighted average of the number of trauma patients with an Injury Severity Score (ISS) greater than nine and the total number of these patients of all ISS's)

These funds are designed to support ongoing readiness costs for continued participation in the trauma system rather than payment for uncompensated care of trauma patients. In order to receive funding, the hospitals must of course be a designated trauma center. In addition, there are several conditions of eligibility and deliverables that must be met. One such deliverable that is worthy of note here relates to “Clinical Practice Management Guidelines.” Arkansas is the only state in the nation that requires trauma centers to incorporate these type guidelines into their day-to-day operations.

2. Emergency Medical Services (EMS)

Funding for EMS Providers

The purpose of providing funding to EMS agencies is to allow for needed equipment purchases and training for their personnel. A total of 119 EMS agencies across the state are participating in the trauma system. Like hospitals, participating EMS agencies are eligible to receive trauma readiness funds. Each agency is funded based on the service area of the agency, the number of EMS agencies in the area, and the type of service (basic life support/advanced life support) afforded. Additional funds are available to agencies in rural areas of the state. Finally, for FY 2016, the funding formula also includes incentives for EMS data submission and the number of calls made to the Arkansas Trauma Communications Center for severely injured patients. A total of \$2,060,350 will be distributed to EMS agencies in FY 2016.

Funding for EMS Training Sites

The purpose of this funding is to assist the training sites in teaching individuals to become emergency medical technicians (EMTs), advanced EMTs, and paramedics. Thirty-one training sites are eligible to participate in the trauma system. A total of \$162,050 is available in FY 2016 to increase our EMS workforce. This scholarship program has assisted many individuals in gaining these EMS certifications.

Funding for EMS Associations

The Arkansas Ambulance Association and the Arkansas Emergency Medical Technician Association are eligible to receive \$46,300 each to provide advanced trauma-related training to currently licensed EMTs and paramedics.

EMS Registry

The Trauma Section, with the approval of the TAC, provided funding to the Section of EMS in the amount of \$750,000 to purchase a new EMS data management solution that will meet today’s reporting

needs. Data reporting and analysis have been very problematic areas for EMS in the past. ImageTrend was chosen to replace the previous vendor due to its record of success in 32 other states. This new software allows the Section of EMS to obtain high quality EMS data that is accurate, reliable, and is compliant with the National EMS Information System. The “hospital hub” module allows EMS services to upload an electronic patient care record (ePCR) into the state’s EMS repository, which hospitals may then access to view and print the ePCR.

3. Arkansas Trauma Communications Center (ATCC):

The purpose of the ATCC is to ensure that traumatically injured patients are transported to the most appropriate hospital to treat their specific injuries in the shortest time possible. Call center operators (trained paramedics and nurses) triage and advise on transport of major and moderate trauma patients to hospitals with the appropriate capability and capacity to provide optimum care. Total FY 2016 funding for the ATCC is \$1,964,449 (includes \$250,000 for the Hand Telemedicine Program- see Section V. below).

Prior to the trauma system, EMS agencies transported trauma patients to the nearest hospital regardless of that facility’s ability to care for the injury. In many cases the patient needed immediate access to a higher level of care. In these cases, and after receiving guidance from the ATCC, ambulances are now able to bypass those lower level facilities and quickly deliver patients to definitive care . Today, ambulances are bypassing lower level trauma centers 32.3% of the time. They are also following ATCC recommendations regarding appropriate destination 88.98% of the time. Scene transports to Level I and II trauma centers are increasing, which is exactly what the system is intended to do. If for some reason a trauma patient in a lower level facility is determined to need a higher level of care, the ATCC can also assist with the hospital-to-hospital transfer. Prior to the trauma system, the receiving hospital’s emergency department would often spend several hours to arrange the acceptance of the traumatically injured patient at a higher level facility. Now, with the resources of the ATCC and the cooperation of the state’s hospitals and EMS providers, the average time of acceptance for all trauma patients (major, moderate, and minor) has been reduced to seven minutes and 55 seconds. Three major changes in our medical delivery system were necessary for this to be possible:

- (1) Real-time notice of hospital capability (medical specialty services) and capacity (ability to handle patients based on current availability of services) to care for trauma patients is monitored 24/7 through an internet-based “Trauma Dashboard” that was developed for the Arkansas Trauma

System. The ATCC is therefore now able to instantly determine exactly what services are available at any given hospital immediately upon notification of an injured patient.

- (2) State-wide communications infrastructure (trauma radios) have been provided to over 500 ambulances to enable our EMS providers to call the ATCC from the scene of an accident for assistance in selecting the most appropriate hospital for the injured patient. This capacity has been expanded to air ambulances, ensuring that all modes of patient transport now have the ability to directly contact the ATCC. This has proven to be effective in allowing ambulances the ability to bypass the closest hospital by providing them with information needed to make the decision to transport to a hospital that can treat specific injuries. Transporting trauma patients to definitive care in the shortest possible time is now a reality in Arkansas.
- (3) Hospitals had to change long-standing policies to allow medical staff in the emergency department the ability to accept patients rather than requiring an admitting specialist to be notified and, after sometimes lengthy discussions, making the decision to either accept or reject the patient.

Since January 3, 2011, the hospital destination of 73,482 trauma patients has been coordinated through the ATCC (46,417 EMS calls from the scene of an accident and 27,065 hospital-to-hospital transfers). Increased volume and experience continues to indicate specific areas where further improvement opportunities exist. One example is that new rules are now in place that govern urgent trauma transfers. Included in this protocol is the ATCC practice of confirming that a hospital-to-hospital transfer is urgent in order to make the most effective use of our limited EMS resources. To date, there have been 43 requests made for urgent trauma transfers and 70% of those were approved by the ATCC.

4. Quality Improvement (QI):

The Trauma Section has developed a robust QI State Plan that both guides trauma system policies and improves the care for patients suffering traumatic injuries. The Plan includes five distinct projects which, in combination, create a comprehensive review of the care provided to a trauma patient.

- (1) The TAC's QI/TRACs Committee has developed a process in which health care providers who are involved in cases with opportunities for improvement in patient care are required to attend a focused QI meeting with all providers to discuss the issues. These discussions are protected from disclosure and the outcomes are designed to be educational in nature rather than punitive.

- (2) The Section has conducted a population-based trauma preventable mortality study. This review examined trauma deaths in 2009 (prior to the trauma system) and those that occurred in 2013 and part of 2014. It is noted that this study is different than the death reviews conducted by relevant committees at the TRAC and TAC levels as noted below. For the preventable mortality study, a specially selected group of experts (trauma surgeons, trauma nurses, and paramedics) conducted a thorough review of medical records associated with these deaths, to include pre-hospital, hospital, and autopsy records. The results will inform trauma system stakeholders regarding the value of the system and what improvements might need to be made in prevention efforts as well as patient care. Preliminary findings from the study show a nearly 50% decline in preventable deaths and a 57% increase in appropriate care provided in approximately a four year period. The Trauma Section will continue this type of review as an on-going initiative. Recommendations from the group of experts will be submitted to healthcare providers in near real time.
- (3) TRACs are continuing to review all trauma-related deaths in their regions. Health care providers that are involved in these cases are asked to furnish information to their respective TRACs for discussion and possible referral to the TAC's TRAC/QI Committee. Again, the purpose is to improve the quality of care for these patients.
- (4) The Section has contracted with a Quality Improvement Organization (QIO) (Qsource) to validate and analyze data related to each component of the trauma system. The QIO's focus will be on system issues such as complete and accurate data submitted to the Trauma Registry. Our hope is to bring to light those areas that might need additional attention in order to ultimately ensure the best care for trauma patients in our state. FY 2016 trauma funding for this contract is set at \$534,999.
- (5) The Section will contract with the American College of Surgeons to participate in its Trauma Quality Improvement Program (TQIP). The focus of TQIP is to "benchmark" participating Arkansas trauma centers against those in other states in order to identify opportunities for improvement within our centers. Arkansas is the first state to require all trauma centers to participate in TQIP. Many other states are now considering this opportunity. In addition, Arkansas is currently the only state that requires trauma centers at all levels to submit data to the National Trauma Data Bank.

5. Trauma Education:

A contract in the amount of \$1,046,788 is in place for FY 2016 with the Arkansas Trauma Education and Research Foundation (ATERF). The Foundation provides 18 specific trauma-related courses to a wide variety of physicians, nurses, and emergency medical services professionals. This was identified by the TAC as being a much needed service in our state and the availability of these courses has dramatically improved trauma care. For example, the provision of the Rural Trauma Training Development Course has resulted in a significant reduction in the time a trauma patient spends in a lower level facility prior to being transferred to a trauma center capable of treating complex injuries. The percentage of general surgeons and emergency medicine physicians who are current in the Advanced Trauma Life Support Course is 72% and 74%, respectively, both of which are above the national average. Eighty-seven percent of Trauma Nurse Coordinators in our state are current in the Trauma Nurse Coordinator Course, again above the national average. A significant change has been made in the way these courses have traditionally been delivered. Prior to this contract, most courses were offered only in Little Rock. Since the date of the first class on February 16, 2012, ATERF has conducted 194 courses in 48 cities and towns across the state. Over 3,700 health-care professionals, representing all 75 Arkansas counties, have attended these advanced trauma courses.

6. Trauma Registry:

The Trauma Registry is operational statewide, recording and tracking individual cases of traumatic injury from their inception through all phases of acute treatment. Reports are being run to identify performance/quality improvement issues and trends in trauma treatment. To date, 77 hospitals are participating in the Registry and have submitted 65,672 records.

It is critically important that Registry data be “risk-adjusted” so that the data can be equitably compared among facilities at the regional and state levels. An example would be the death of a 40 year old male from a fall at one trauma center and the death of an 85 year old male, again from a fall, at another center. One would not expect that the comorbidities, or even the treatment, would be the same for these individuals. The Trauma Section is in the process of contracting with a company that has a software program to “risk-adjust” the data.

7. Injury and Violence Prevention (IVP):

The Trauma System Act mandates that ADH allocate funds for the development of injury prevention programs. Arkansas is fortunate to have available funding in place, as well as several components which

will move IVP forward in our state. As noted above, an IVP Committee exists in each of the seven TRACs throughout the state. These committees have the discretion to set priorities and choose evidence-based interventions to attack the leading injury mechanisms in the state (suicides, motor vehicle crashes, unintentional poisonings, assaults, and falls). A Memorandum of Agreement (MOA) between ADH's IVP and Hometown Health Improvement (HHI) Sections provides funding in the amount of \$500,000 per year for HHI employees around the state to engage in IVP activities. HHI personnel serve as "boots on the ground" workers who assist the TRACs in IVP initiatives in their respective regions.

In addition to dedicated trauma system funding, the IVP Section utilizes other funding sources to conduct its work. Due to limited staffing for IVP within the ADH, the Section must be very strategic in applying for grants. The Section is in the first year of the Garrett Lee Smith Suicide Prevention Grant. This is a five year grant at \$736,000 per year for a total of \$3,680,000. This will allow the Section to address the leading cause of injury death in our state by conducting interventions designed to reduce suicide in people ages ten to 24. It is noteworthy that Act 1887, passed during the 2015 Arkansas legislative session, mandates a 23-member "Arkansas Suicide Prevention Council." The Act states that the ADH is the designated state agency for suicide prevention purposes and related state and federal funding applications. The purpose of the Council is to serve as the central body on suicide prevention efforts across the state.

The Section is also the recipient of the Rape Prevention Education Grant funded at \$376,000 per year for five years for a total of \$1,880,000. Finally, the Section also is conducting work under the "Community Collaborative to Increase Seat Belt Use", an \$81,948 grant from the Highway Safety Office of the Arkansas State Police (funded by the National Highway Traffic Safety Administration).

8. Rehabilitation:

Rehabilitation is a critically important component of a successful trauma system. Beginning January 1, 2011, the Arkansas Spinal Cord Commission (ASCC) began a statewide needs assessment for rehabilitation. The results of this assessment allowed necessary strategic planning to occur. The "Trauma Rehabilitation Strategic Plan 2012-2015" presented to the TAC includes four major goals: to ensure Arkansans who sustain traumatic disabling injuries have access to high quality, comprehensive rehabilitation in our state, to create a systematic approach to capture acute, rehabilitation, and community data metrics to determine areas of improvement in trauma patient outcomes, to build the capacities of healthcare providers to deliver quality rehabilitative care, and to increase individuals' options to integrate successfully into the community. The 2016-2019 Strategic Plan was approved by

the TAC's Rehabilitation Committee and forwarded to ADH. This new plan will take effect January 1, 2016. An MOA between ADH and the ASCC provides \$500,000 to this agency in FY 2016 to implement the strategic plan. A statewide Traumatic Brain Injury (TBI) Registry has been initiated, a disability resource website has been created, and the number of rehabilitation conferences has increased from one to four per year.

The TBI Registry has averaged 25 new referrals per month since it began in November, 2013. Total referrals through June 30, 2015 were 507. The attendance has averaged an increase of at least 10% over the four years for the Trauma Rehabilitation Conference. The Brain Injury Conference had an increase of 30% in 2015, with 256 attendees. In addition, Certified Brain Injury Specialist (CBIS) Training was provided in March, 2015. Arkansas now has 29 new CBIS's.

In cooperation with UAMS, the TRIUMPH project was initiated. This is a 24/7 call center that provides access to emergency department physicians, primary care physicians, and individuals to speak with specialists in the area of spinal cord injury. This improves the level of care for Arkansans who live in the more rural parts of the state, prevents unnecessary emergency room visits, and offers educational opportunities for all physicians through the UAMS "Learn on Demand" portal. Clinical practice guidelines are now developed for traumatic brain injury and the call center began taking calls related to TBI in the spring of 2015.

To facilitate community integration, the program has added support for a Brain Injury Survivor's Meeting and support for survivors of traumatic burns. The first Survivor's Meeting had 90 in attendance and focused on advocacy and resource identification. Next years' meeting is focusing on return to work/school issues. Plans are also underway for the second Tools 4 Life Assistive Technology Conference, to be held in March, 2016.

V. TELEMEDICINE

Trauma Image Repository (TIR)

The creation of the TIR is yet another important development as we implement our trauma system. Eighty-two hospitals across and outside the state are now able to send or receive radiological images for all types of traumatic injuries to a secure, centrally located repository. Any physician or specialist who provides care at the receiving facility (i.e., a higher level trauma center) can access these images, either through a web-based application or by having images sent directly to the hospitals "Picture Archiving and Communication System." Since the system's inception in July 2011, the total number of images sent

to the repository as of June 30, 2015 is approximately 5,892,596 for 16,595 patients. The TIR has dramatically improved patient care by ensuring that trauma teams at receiving facilities receive adequate advance notice of incoming patients. Upon arrival, there is little or no delay in patients getting the appropriate care, such as going immediately to the operating room where the surgical team is waiting. Having scans sent electronically also reduces the need to rescan patients upon their arrival at the receiving trauma center. Reducing scans (x-rays, MRIs, etc.) reduces the risk of cancer and results in significant cost savings to the state. The reduction of cancer risk is especially important for pediatric patients. FY 2016 trauma funding for the TIR is set at \$536,440.

Hand Program

A program is currently in place to deal specifically with hand injuries through the TIR. These type injuries are often problematic for emergency room physicians throughout the United States. Contracts have been executed with seven Arkansas hand surgeons, who now utilize telemedicine to initially evaluate these injuries and ensure the patient is transported to the most appropriate location as expeditiously as possible. Transfers of patients with hand injuries to out-of-state hospitals have been significantly reduced due to this program. FY 2016 trauma funding for the hand program is \$250,000. A similar program for patients with burn injuries is currently being developed.

VI. OTHER INITIATIVES

Website Development:

ADH's website at www.healthy.arkansas.gov includes a robust section on the trauma system as well as IVP. It can be accessed by clicking on Trauma System under "Quick Links" on the left side of the ADH home page. Viewers can quickly obtain information on the various aspects of the system that have been implemented since the system's inception in 2009, to include videos, maps, and graphics. Minutes from past TAC meetings and future schedules for a wide variety of trauma-related meetings are frequently updated.

Law Enforcement and First Response Tactical Casualty Care (LEFR-TCC)

The LEFR-TCC course teaches public safety first responders (law enforcement, firefighters, and other first responders) the basic medical care interventions required to help save an injured responder's or other person's life until EMS practitioners arrive on a tactical scene. In January 2015, Metropolitan Emergency Medical Services (MEMS) requested funds in the amount of \$49,000 to provide individual first aid kits, including tourniquets, to every central Arkansas law enforcement officer who attends the

training. The TAC approved the request. MEMS has taught over 30 courses to date, certifying a total of 534 law enforcement officers from police departments across Central Arkansas. MEMS has documented evidence of seven lives saved due to this training in the central Arkansas area. As a result of the program's success, in September 2015 the TAC approved an additional \$66,750 to complete the training for law enforcement officers in central Arkansas during FY 2016.

Emergency Physician Rural Residency Rotation Program

A Memorandum of Understanding in the amount of \$59,027 is in place with UAMS' Department of Emergency Medicine to institute an Emergency Physician Rural Residency Rotation Program. The program provides up to eight third-year Emergency Medicine (EM) Residents the opportunity to train for one month at a time in rural communities. The purpose of the program is to expose these Residents to practicing in rural settings in hopes that the penetrance of EM-boarded physicians in these areas will increase.

Burns:

Grants for burn treatment readiness in the amounts of \$250,000 per year are available for education to burn centers within the Arkansas Trauma System on treatment of burns, to include education for use of telemedicine, and to purchase needed equipment.

VII. PROCESS AND OUTCOME SYSTEM METRICS

It is vitally important that major system components have metrics in place through which to measure success. Over approximately the past year, Trauma Section personnel and a variety of stakeholders have been diligently working to develop these metrics. They are very near completion and can soon be found on the ADH website. They have been developed for the pre-hospital, hospital, IVP, rehabilitation, and overall trauma system areas. Both process and outcome metrics have been developed. An example of a process metric is the number of inter-facility transfers the ATCC has handled. We would expect to see this number increase as the system matures. An example of an outcome metric would be the number of preventable deaths that occur over time. We would of course expect that this number would decline as we develop the trauma system. The preventable mortality study, mentioned on page 9 above, is the mechanism we use to measure this metric. Having these metrics in place will allow us to benchmark Arkansas against other states' and national trends in these important areas.

VIII. INJURY MORTALITY TRENDS

According to the Centers for Disease Control, in 2009 Arkansas' overall injury fatality rate was 76.8 per 100,000. In 2013, this rate was reduced to 72.4 per 100,000, a decrease of 5.7 percent. It is noted that the national data in this category trended upward by 3.7 percent during this same timeframe.

IX. RETURN ON INVESTMENT

According to Mick Tilford, PhD, Professor and Chair of the Department of Health Policy and Management with the University of Arkansas for Medical Sciences' College of Public Health, the financial impact of the number of lives saved due to the implementation of the Arkansas Trauma System is over \$100 million a year or a fivefold return on investment.