



## **TRAUMA SYSTEM UPDATE**

**OCTOBER 2014**

### **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). Having statewide designated trauma centers within a comprehensive system ensures that victims sustaining traumatic injuries will be transported to definitive care in the shortest possible time and that the treatment they receive is the best available.

### **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.

### **Arkansas Trauma System Rules and Regulations**

On September 6, 2014, the revised *Arkansas Trauma System Rules and Regulations* became effective. This was a major step forward for the trauma system.

### **Hospital Designation:**

The designation process is intensive for hospitals. A great deal of preparation is required. Seventy-two hospitals have submitted intent applications to become trauma centers (from Level I, the highest level of designation, to Level IV, the lowest level). To date, 69 hospitals have been designated at the following levels:

- Level I (provides comprehensive clinical care and is a community resource; i.e., has education, research, and outreach components): 5
- Level II (provides comprehensive clinical care; from a clinical standpoint, a Level II provides the same care as a Level I): 4
- Level III (provides treatment for mild and moderate single system injuries; most traumatic injuries can be treated at a Level III facility): 20
- Level IV (provides stabilization for severely injured patients; transfer to a higher level trauma center is usually required): 40

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.

**Funding for In-state Trauma Centers:**

- Level I trauma centers receive between \$1 million and \$1.5 million each year of designation
- Level II trauma centers receive between \$500,000 and \$750,000 each year of designation
- Level III trauma centers receive between \$125,000 and \$187,500 each year of designation
- Level IV trauma centers receive between \$25,000 and \$37,500 each year of designation

For FY 2015, in-state trauma centers at the various levels will receive (i.e., on a reimbursable basis) the following amounts:

- Level I trauma centers: \$1,045,389
- Level II trauma centers: \$522,694
- Level III trauma centers: \$130,674
- Level IV trauma centers: \$26,135
- (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 – only patients with an injury severity score of nine or over are considered in the formula)

The amount of money the hospitals receive for each year of designation is dependent on the amount of “carry forward” funding available in a given year. As the “carry forward” funds decreased from FY 2014 to FY 2015 due to more hospitals being designated and being paid as well as other initiatives, less money over base funding is available for distribution to participating hospitals. 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.

### **Hospital Cost Study**

In October 2014, a study (captioned “*Determining the Hospital Trauma Financial Impact in a State-Wide Trauma System*”) was completed. Thirty-one hospitals participated in the study. The purpose was to determine the hospital costs associated with trauma readiness, trauma center certification, and the cost and reimbursement for the care of trauma patients. This study will allow the ADH to better determine how trauma system funding should be allocated to hospitals and other components of the system. The cost of the study was \$278,286.99.

### **Funding for Emergency Medical Service (EMS) Providers:**

A total of 117 EMS providers across the state are participating in the trauma system. Like hospitals, participating EMS providers are eligible to receive trauma readiness funds. Each service is funded based on the service area of the provider, the number of EMS providers in the area, and the type of service (basic life support/advanced life support) afforded. Additional funds are available to providers in rural areas of the state. Finally, for FY 2015, 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 \$2,175,834 will be distributed to EMS providers in FY 2015. Due to the reduction of “carry forward” funds as noted above, overall funding for EMS providers for FY 2015 is down from the \$2,639,440 available in FY 2014.

### **Funding for EMS Training Sites:**

Thirty-two training sites are eligible to participate in the trauma system. These sites provide training to become emergency medical technicians (EMTs), advanced EMTs, and paramedics. A total of \$171,133 is available in FY 2015 to increase our EMS workforce. Since 2009, our state has seen a net gain of 154 EMTs and paramedics.

### **Funding for EMS Associations:**

The Arkansas Ambulance Association and the Arkansas Emergency Medical Technician Association are eligible to receive approximately \$48,895 each to provide advanced trauma-related training to currently licensed EMTs and paramedics.

### **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 2015 funding for the ATCC is \$1,868,012 (includes \$250,000 for the Hand Telemedicine Program- see below in this section).

Prior to the trauma system, EMS providers transported trauma patients to the nearest hospital regardless of that facility's ability to care for the injury. In many cases the patient needed a higher level of care. Through 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 23.9% of the time. They are also following ATCC recommendations regarding appropriate destination 93.0% 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 17 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 able to instantly see what hospital has what services available immediately upon notification of an injured patient.
- (2) State-wide capable 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 57,909 trauma patients has been coordinated through the ATCC (37,884 EMS calls from the scene of an accident and 20,025 hospital-to-hospital transfers). Increased volume and experience continues to indicate specific areas where further improvement opportunities exist. One specific example involves serious hand injuries, in particular amputations of fingers where reattachment may be possible. Several meetings with hand specialists have been held to specifically identify hospitals where the capability and capacity exists to treat these patients, both in-state and out-of-state. Through the Hand Telemedicine Program, 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. In addition, 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.

#### **Trauma Image Repository (TIR):**

The creation of the TIR is yet another important development as we implement our trauma system. Eighty-two hospitals across the state are now able to send radiological images 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 them sent directly to their hospital's "Picture Archiving and Communication System." Since the system's inception in July 2011, records for 11,457 trauma patients have been entered into the repository (the total number of images sent to the repository to date is 4,040,463). This system has both sped up treatment from the point of injury to definitive care and decreased the number of radiological studies

performed. This is especially important for pediatric patients. FY 2015 trauma funding for the TIR is set at \$478,640.

The following is a recent experience with TIR: *“TIR saved a life! A young person struck by a car while on a bicycle had an epidural hematoma and was changing neurologically. TIR pushed the films from a Level III Trauma Center to a Level I Trauma Center. The images were downloaded (within 1 min.) and the receiving trauma center was able to have an entire operating crew with neurosurgeons available when she arrived. She spent 13 minutes in the trauma room and went up to the OR where she had her epidural evacuated safely and she is doing very well. A life was saved tonight!”* Todd Maxson, MD; September 28, 2012.

### **Emergency Physician Rural Residency Rotation Program**

A Memorandum of Understanding in the amount of \$59,027 is in place with the University of Arkansas for Medical Sciences’ (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.

### **Governor’s Trauma Advisory Council (TAC):**

The TAC and its seven Committees (Finance, Hospital, Quality Improvement/Trauma Regional Advisory Councils, Injury and Violence Prevention, 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. 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 \$40,000 (total of \$280,000 for all seven TRACs). Each TRAC has its own medical director.

### **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 is conducting a population-based trauma preventable mortality study. This review will examine trauma deaths prior to the trauma system and those that have occurred since the system's inception in 2009. 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.
- (3) TRACs are continuing to review all trauma related deaths in their regions as well as review ADH-issued reports on certain "critical events." Health care providers who 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. FY 2015 trauma funding for this contract is set at \$280,209.
- (5) The Section will contract with the American College of Surgeons to participate in its Total 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.

### **Trauma Education:**

A contract in the amount of \$1,046,788 is in place for FY 1015 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 his/her injury. 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 154 courses in 48 cities and towns across the state. Over 2,600 health-care professionals, representing 71 of the 75 Arkansas counties, have attended these advanced trauma courses.

### **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.

### **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. The IVP Section at ADH funds and manages these components. First, the Injury Prevention Center at Arkansas Children's Hospital has been the recipient of trauma system grant funding since FY 2011, and for FY 2015 is funded at \$578,000. The Center has implemented the Statewide Injury Prevention Program (SIPP), which includes personnel who are experts in various aspects of IVP. These employees provide technical assistance to a variety of people who implement IVP interventions. Another important component that is linked with ADH's IVP Section and SIPP personnel is

ADH's Hometown Health Improvement (HHI) Initiative. A Memorandum of Agreement (MOA) between ADH's IVP and HHI Sections provides funding in the amount of \$500,000 per year for HHI employees in each of Arkansas' 75 counties to engage in IVP activities. These "boots on the ground" personnel have been invaluable in working with communities to conduct a variety of evidence-based IVP interventions. These programs/interventions are known to be effective and will attack those injury mechanisms having the highest mortality and morbidity rates in our state (i.e., motor vehicle crashes, suicides, unintentional poisonings, assaults, and falls).

The ADH's IVP Section was just awarded 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 second leading cause of injury death in our state by conducting interventions designed to reduce suicide in people ages ten to 24. 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.

### **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. An MOA between ADH and the ASCC provides \$500,000 to this agency in FY 2015 to implement the strategic plan. A statewide Traumatic Brain Injury 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. The conference attendance has increased by a least 15% each year for the Trauma Rehabilitation Conference and the Brain Injury Conference. In addition, Certified Brain Injury Specialist (CBIS) Training was provided in April, 2014. Arkansas now has 15 new CBISs. There are another 15 individuals registered for the CBIS training to be held in March 2015. There is also one new Assistive Technology Professional working in rehabilitation due to the pay for performance initiatives of this program. 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 being developed for traumatic brain injury and the call center is scheduled to begin taking calls related to traumatic brain injury in the spring of 2015.

Finally, in cooperation with the University of Central Arkansas Occupational Therapy Department, funding was provided for the creation of an exercise video for individuals who have survived traumatic injuries, but have limited lower extremity function. This will allow rehabilitation hospitals to provide a video home program for those discharged back to communities with limited or no exercise options.

#### **Burns:**

Grants for burn treatment readiness in the amounts of \$250,000 per year have been made to the Burn Center at Arkansas Children's Hospital for FYs 2011-2015. These grants allow the Burn Center to increase education to trauma centers across the state on the treatment of burns and to purchase needed equipment.

#### **Website Development:**

ADH's website at [www.healthy.arkansas.gov](http://www.healthy.arkansas.gov) includes a robust section on the trauma system as well as injury and violence prevention. 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.

#### **Overall Injury Mortality Trends:**

In 2009, Arkansas' overall injury fatality rate was 74.8 per 100,000. In 2011, this rate was reduced to 72.1 per 100,000, a decrease of 3.6 percent. It is noted that the national data in this category trended upward by 3.3 percent during this same timeframe.

**Goals for the Remainder of FY 2015:**

- Initiate the Total Quality Improvement Program through the American College of Surgeons
- Develop process, performance, and outcome metrics to measure progress in the major trauma system components (IVP, pre-hospital, ATCC, hospital, and rehabilitation)
- Upgrade the EMS data collection system
- Consider ways to build an all-encompassing system in our state that successfully deals with all time-sensitive diseases (trauma, stroke, and STEMI)
- Consider ways to develop a sustainable funding plan for trauma that utilizes third-party payers as well as state general revenue
- Provide on-going funding for hospitals, EMS providers, and EMS training sites
- Ensure the continued development of the seven TRACs to provide meaningful, beneficial impact on the trauma system
- Work with the TAC to develop strategies for continued trauma system development and improvement
- Monitor grants to ensure proper utilization of funds and accountability