



**Your**

**ARKANSAS TRAUMA SYSTEM**

*Saving Lives is **OUR** Business*

est. 2009



Arkansas Department of Health

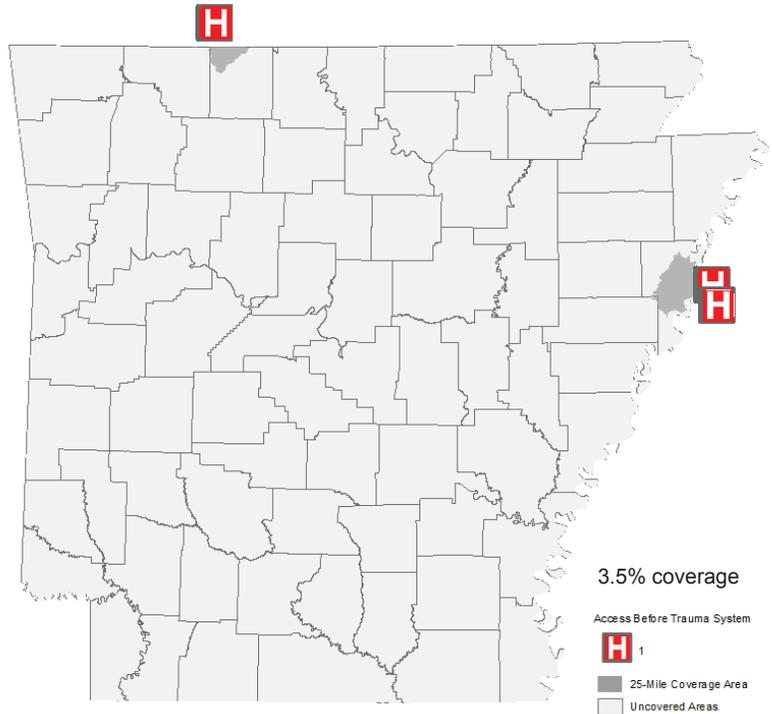
November 2012

# THAT WAS THEN

## 2008 - Pre-Trauma System Act

“The Arkansas State Trauma System is NOT simply a matter of politics or economics; it is a matter of life and death. Strong leadership and aggressive trauma system development, coupled with substantial legislation and funding, will result in lives saved and a better quality of life for your people.”

Micheal R. Rotondo, MD, FACs Chair  
Trauma Systems Evaluation and Planning  
Committee, American College of Surgeons

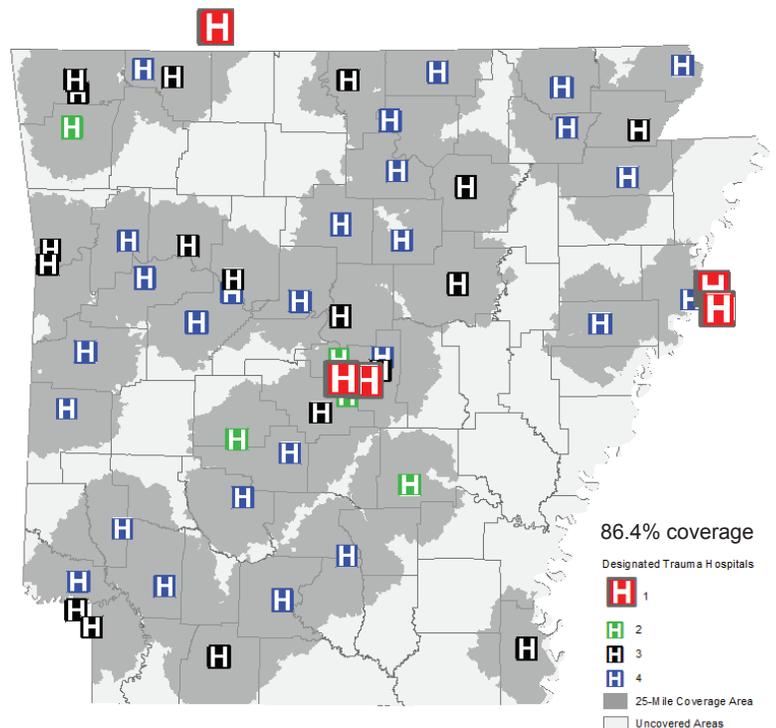


# THIS IS NOW

## 2011 - Post-Trauma System Act

“The amount of progress that has been made in a little over a year of operation is truly remarkable.”

Robert J. Winchell, MD, FACs Chair  
Trauma Systems Evaluation and Planning  
Committee, American College of Surgeons



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# INTRODUCTION

Public health can be defined as “the science and art of preventing disease, prolonging life, and promoting health through the organized efforts and informed choices of society, organizations, public and private, communities and individuals” (1920, C.E.A. Winslow). Now 92 years old, this definition is still applicable in today’s world and forms the core of what the Arkansas Department of Health (ADH) does on a daily basis. Preventing injury and prolonging life are exactly what Arkansas’s new trauma system accomplishes. It does so through the organized, systematic efforts of many talented individuals and organizations, and is now firmly established as a critical component of Arkansas’s public health policy.

## THE PROBLEM

**Arkansas  
was cited  
as having the  
worst system of  
emergency care  
in the nation.**

- American College of  
Emergency Physicians,  
2008

1. **Injury** is the number one killer of Arkansans between the ages of one and 44. In the medical field, injury is called trauma. A trauma is a severe and body altering physical injury, such as removal of a limb or other life-threatening injury. A trauma patient is an injured person who requires a timely diagnosis and treatment by a multidisciplinary team of health professionals with appropriate equipment and resources to reduce or eliminate the risk of death or permanent disability.
2. In 2010, Arkansas’s overall injury fatality rate was 31 percent higher than the national average and 82 percent higher with respect to deaths from motor vehicle accidents (this is the most recent year these figures were made available). This problem is exacerbated by Arkansas’s rural road system, the 12th largest in the nation.
3. In a study conducted by the American College of Emergency Physicians in 2008, Arkansas was cited as having the *worst* system of emergency care in the nation.
4. Prior to 2009, Arkansas was one of three states without a trauma system and the *only state* without a designated trauma center.

# THE SOLUTION

Despite efforts to initiate a trauma system in Arkansas over the last two decades, the system's history has been somewhat unsettled. Some of the key activities and timeframes are as follows:

**1975** - The Arkansas Legislature passed the initial Emergency Medical Services (EMS) legislation (Act 435). Focusing on pre-hospital EMS services and their method of operation, it did nothing to create the components of a true trauma system.

**1993** - The Arkansas Legislature passed the Trauma System Act (Act 559). Although the Act authorized the ADH to develop and implement a "comprehensive trauma care system," it provided no funding for this purpose and little progress was made over the next decade.

**2002** - The Arkansas State Board of Health, under the authority of Act 559, promulgated the Rules and Regulations for Trauma Systems. Although the Rules provide the overall structure for the system, implementation remained delayed due to lack of funding.

**2007** - House Bill 1575, which would have created a state-subsidized trauma system, was not passed because legislators could not agree upon how it would be funded.

**2008** - Governor Mike Beebe provided \$200,000 from the Governor's Emergency Fund to establish a new computer database called a "dashboard," which was an electronic communications link to facilitate the transfers of traumatically injured patients between hospitals.

**2009** - The Arkansas Legislature passed a law to "increase the tax on cigarettes and other tobacco products" (Act 180). This bill noted that "existing funding levels are inadequate to meet the medical care needs of the state" and that funds raised from the tobacco tax be utilized to increase funding levels for this purpose.

**2009** - The Arkansas Legislature passed the Trauma System Act (Act 393). The Act authorized up to \$25 million per year to implement a statewide trauma system.

**2009** - The Arkansas Legislature passed Act 1386, which appropriated funds to the ADH. Included in this funding was \$25 million for the trauma system.

**"Although momentum was slowly building over the years, it was not until passage of the Trauma System Act in 2009 and related funding measures that real progress began toward trauma system implementation."**

Bill Temple, JD  
Branch Chief for Trauma and Injury Prevention  
Arkansas Department of Health



# IMPLEMENTATION

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**P**eople often ask, “When will the trauma center be built?” The answer is something of a surprise. We are not in the business of constructing buildings; rather, we are in the business of creating a *system* and designating hospitals as trauma centers. A trauma system is an organized and coordinated plan within a state that is integrated with the local public health system and delivers the full range of care to patients with severe or life-threatening injuries. The trauma system is comprised of many components that must work seamlessly together to ensure that trauma patients in our state receive the best possible care.

Based on national data and the experience of other states, it usually takes seven to 10 years to demonstrate a reduction in morbidity and mortality as a result of a new trauma system. Key components of our trauma system include:

1. Infrastructure at ADH
2. Pre-hospital Emergency Medical Services (EMS)
3. Statewide Communications System and Call Center
4. Designated Trauma Centers
5. Trauma Registry
6. Rehabilitation
7. Quality Improvement
8. Injury Prevention
9. Education



**Dr. Paul Halverson** spoke at the press conference announcing the funding of the Arkansas Trauma System in 2009, saying, “The ‘golden hour’ is the magic window of opportunity during which appropriate treatment by appropriately trained healthcare professionals can make the difference in life, death, and/or disability in the future. In Arkansas, because of the lack of a trauma system, hundreds of victims are dying because they can’t get to the right place at the right time.”



To view the ADH Trauma Section web page, scan this QR code with the QR Reader App.

# Arkansas Department of Health

# INFRASTRUCTURE

## and ADMINISTRATION

## TRAUMA SYSTEM ACT

The Trauma System Act clearly places responsibility for system implementation on the ADH. To accomplish this task, the Injury Prevention and Control Branch was created. The Act established 18 positions to administer the trauma system and all personnel have been hired.

## GOVERNOR’S TRAUMA ADVISORY COUNCIL (TAC)

The TAC and its six subcommittees (Finance, Hospital Designation, Quality Improvement/Trauma Regional Advisory Councils, EMS, Injury Prevention, and Rehabilitation) meet on a monthly basis and furnish valuable guidance to the ADH regarding development of the trauma system. This statutorily-mandated 26-member council is invaluable to the success of the system.

## HOSPITAL DESIGNATION

A designation process for hospitals was created by the ADH. The process involves hospitals submitting a pre-review questionnaire and then undergoing a rigorous site survey by a team of physicians and nurses. Once designated, a hospital is certified as an Arkansas trauma center for four years and is eligible for “sustaining” grant funds.

## FUNDING

Funding for trauma readiness is provided to 75 participating hospitals, 118 EMS providers, and 23 EMS training sites. The strategic initiatives described in this publication are also made possible due to trauma system funding. In fiscal year 2012, \$24,399,956 was expended for all authorized activities.

# TRAUMA ADVISORY COUNCIL



Dr. James Graham, Chairman of the Governor's Trauma Advisory Council (TAC), provides leadership to the TAC and its six subcommittees (Finance, Hospital Designation, Quality Improvement/Trauma Regional Advisory Councils (TRACs), EMS, Injury Prevention, and Rehabilitation). The TAC meets on a monthly basis and furnishes 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.



## FINANCE SUBCOMMITTEE

R.T. Fendley serves as Chair of the Finance Subcommittee, which advises the ADH on distribution of trauma system funding. This subcommittee is primarily responsible for recommending an annual budget each year to the ADH, and ultimately, the Board of Health for approval. In addition, the subcommittee reviews and recommends action on new funding requests not reflected in the annual budget.



## HOSPITAL DESIGNATION SUBCOMMITTEE

Dr. James Booker serves as Chair of the Hospital Designation Subcommittee, which oversees a complex and rigorous designation process. The subcommittee reviews site visit findings and provides the ADH with recommendations regarding designation, reviews letters of intent from hospitals that have not yet been designated, and is currently working on substantial revision of the Arkansas Rules and Regulations for Trauma Systems.



## QUALITY IMPROVEMENT / TRACs SUBCOMMITTEE

Dr. Charles Mabry serves as Chair of the Quality Improvement/TRACs Subcommittee, which is responsible for the state-level performance improvement review of cases submitted from the TRACs with opportunities for improvement. In addition, this subcommittee is responsible for review of state-level performance improvement measures and submitting recommendations for trauma system improvement to the TAC.



## EMS SUBCOMMITTEE



Dr. Clint Evans serves as Chair of the EMS Subcommittee. This subcommittee meets regularly to identify changes in pre-hospital business practices needed to implement the trauma system. Issues include implementing a statewide communications system, EMS data submission, and securing backfill agreements for EMS providers. The TAC EMS Subcommittee coordinates closely with the Governor's EMS Advisory Council.

## INJURY PREVENTION SUBCOMMITTEE



Dr. Mary Aitken serves as Chair of the Injury Prevention Subcommittee. This group provides guidance to the ADH regarding implementation of the Statewide Injury Prevention Program, designed to reduce the burden of injury mortality and morbidity. The subcommittee reviews injury trend data over time to identify priorities for prevention activities and to monitor progress in injury prevention.

## REHABILITATION SUBCOMMITTEE



Jon Wilkerson serves as Chair of the Rehabilitation Subcommittee. The "Trauma Rehabilitation Strategic Plan 2012-2015" 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.

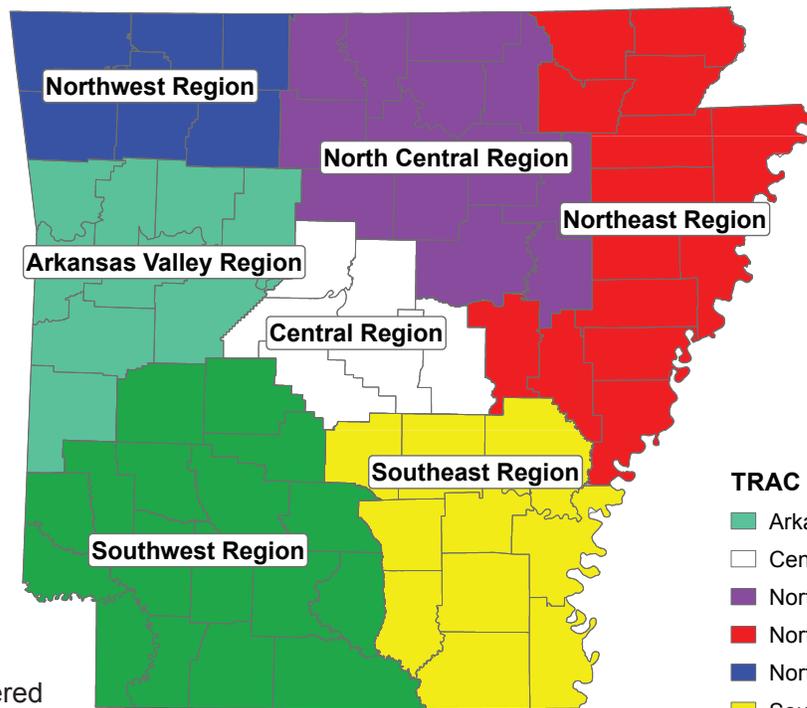
# TRAUMA REGIONAL ADVISORY COUNCILS

The seven Trauma Regional Advisory Councils (TRACs), like the Governor's Trauma Advisory Council (TAC) and its six subcommittees, play a crucial role in Arkansas's Trauma System. Whereas the TAC is the umbrella organization that provides advice and guidance to the ADH with respect to trauma system implementation, the TRACs bring together a wide range of health care professionals at the regional level to deal with issues that are important to their respective geographical areas. In short, this is where the "rubber meets the road." Each TRAC has structured membership, by-laws, and meetings that are posted well in advance so both members and interested parties from the general public can attend.

Although the TRACs discuss a large number of diverse issues, two areas provide good examples of their work. First, each TRAC has an Injury Prevention (IP) Subcommittee. These subcommittees work in conjunction with their counterpart subcommittee at the TAC level and decide what their primary injury prevention problems are in their area. Once this is determined, they can then seek advice from the TAC IP Subcommittee regarding best practice, evidence-based strategies to address these problems. Working with local partners, these strategies can then be implemented. Second, each TRAC has a Quality Improvement (QI) Subcommittee. This group constantly monitors the quality of trauma care delivered in its region and deals with issues

that have been determined to adversely affect patient care, whether it be at the pre-hospital, hospital, and/or post acute care stages. Individuals directly involved in the case are invited to appear before the QI Subcommittee and discuss the identified issues.

The Arkansas Legislature determined that these deliberations are part of the QI process and therefore are confidential in nature. This confidentiality is important to allow a free flow of information and education. Although most issues can be resolved at the TRAC level, those that are particularly noteworthy and/or are statewide "system" issues are referred to the TAC's QI/TRACs Subcommittee for resolution. The QI process is perhaps one of our trauma system's strongest assets and will undoubtedly lead to substantial improvement in patient care in Arkansas.



Date: August 23, 2011  
Source: Arkansas Department of Health  
Map created by: Amanda Worrell, GISP

## TRAC Regions

- Arkansas Valley
- Central
- North Central
- Northeast
- Northwest
- Southeast
- Southwest

# EMERGENCY MEDICAL SERVICES



In order for the trauma system to perform at an optimal level, the emergency medical services (EMS) component must perform as intended. In the short time since the system's inception, key elements have been put in place to ensure this occurs. These include funding for ambulance companies, training for paramedics and emergency medical technicians (EMTs), a statewide communications system and call center, and a mechanism for the EMS community to have its concerns and recommendations heard through the Governor's Trauma Advisory Council.

During the course of trauma system implementation, changes in long-standing behavior patterns of both EMS providers and hospitals are necessary. As one might imagine, changing these methods of operation for approximately 120 ambulance companies and 6,000 paramedics and EMTs in our state will not occur "overnight." Working with our outstanding

EMS partners, however, we have begun to "move the needle" with respect to getting trauma patients to the right hospitals in the shortest time possible. Rather than taking the severely injured patients to the nearest hospital, as was the case prior to the trauma system, EMS providers are now working with the Arkansas Trauma Communications Center (ATCC) to transport patients to the most appropriate hospital to treat their specific injuries. This one change in operations will save many lives.

In 2011, more than 36 million people in the United States received treatment from EMS professionals. This staggering number clearly demonstrates EMS's importance to our overall healthcare system. More specific to Arkansas, EMS providers are truly the "gateway" to the continuum of care that awaits victims of traumatic injuries in our state, and we are proud to work closely with this group of caring providers.



A group of EMS providers received trauma grant funding at a Governor's reception at the State Capitol.

**"In the past, there could be six to eight hour delays in getting trauma patients transferred to the appropriate hospital. Now, the average time is about **seven minutes.**"**

Jeff Tabor, ATCC Director, MEMS



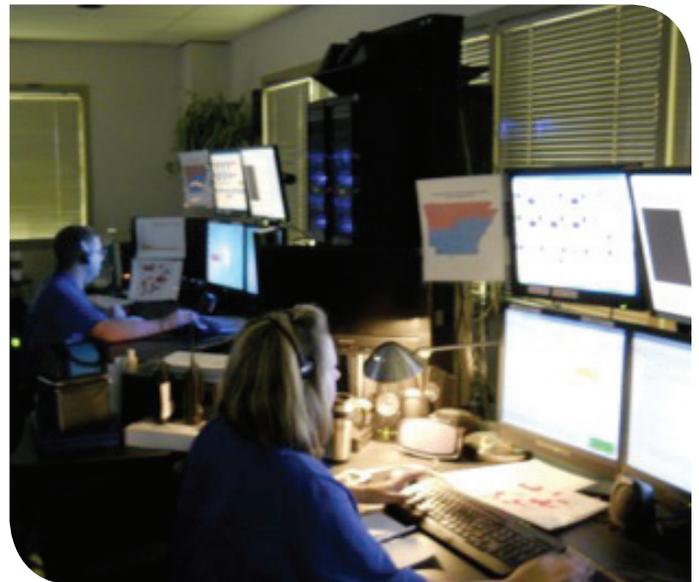
# Statewide COMMUNICATIONS and COORDINATION OF CARE

Prior to the trauma system, VHF (very high frequency) radio coverage was limited and ambulance services had only the ability to communicate with their local dispatch centers. As a result, patients suffering traumatic injuries anywhere in the state were taken to the nearest hospital, regardless of their injuries and the capacity of that hospital to treat them. In the world of trauma, all hospitals are not equal.

In addition, hospital-to-hospital transfers of trauma patients were completely unregulated in Arkansas. A hospital attempting to transfer a patient to a higher level trauma center would often wait hours for permission to begin the transfer. There was also no distinction made between urgent and non-urgent transfers, resulting in inconsistent and sometimes inappropriate movement of patients.

## ARKANSAS WIRELESS INFORMATION NETWORK (AWIN)

The ADH made a decision to utilize AWIN rather than the traditional VHF system. Upon approval from the AWIN Executive Committee, the ADH purchased 600 trauma AWIN radios and installed them in every ambulance in the state. This has proven to be the best solution in that it gives all ambulances the ability to directly contact the Arkansas Trauma Communications Center (ATCC) through a state-of-the-art radio system.



**“Unless patients need immediate stabilization, we don’t want them lying in a bed in a hospital that can’t treat their specific traumatic injuries. *The clock is ticking.*”**

Renee Joiner, RN, BSN  
Trauma Section Chief, ADH



**Governor Mike Beebe speaking with MEMS Director Jon Swanson during a visit to the Arkansas Trauma Communications Center in Little Rock.**

## ARKANSAS TRAUMA COMMUNICATIONS CENTER

The Arkansas Trauma Communications Center (ATCC) began operations on January 3, 2011. Its mission is to assist hospitals and EMS providers in getting traumatically injured patients moved to the appropriate trauma centers in the shortest time possible. It does this in two situations. The first is a “scene call,” during which an ambulance responds to the scene of the accident/injury, such as a motor vehicle crash. The second is a hospital-to-hospital transfer, during which the original accepting hospital finds it necessary to transfer the patient to a higher level trauma center that is better able to care for a specific injury or set of injuries.

Since it began operations through October 31, 2012, the hospital destination of 18,542 trauma patients from the scene has been coordinated through the ATCC (2,070 major, 5,780 moderate, and 10,692 minor). In addition, the ATCC has facilitated 9,766 hospital-to-hospital transfers of trauma patients (1,029 major, 2,597 moderate, and 6,140 minor).

Prior to the ATCC, patients suffering traumatic injuries would normally have been taken to their local hospital, regardless of their injuries and the ability of the facility to treat them. Now, the ATCC assists EMS providers in transporting their patients to the *most appropriate* hospital.

In addition, it would often take hours for a receiving hospital to accept a patient from a smaller hospital. Due to changes in the procedure for acceptance, as well as assistance from the ATCC, the average time for acceptance for major trauma patients is now under *seven minutes*.

# HOSPITALS

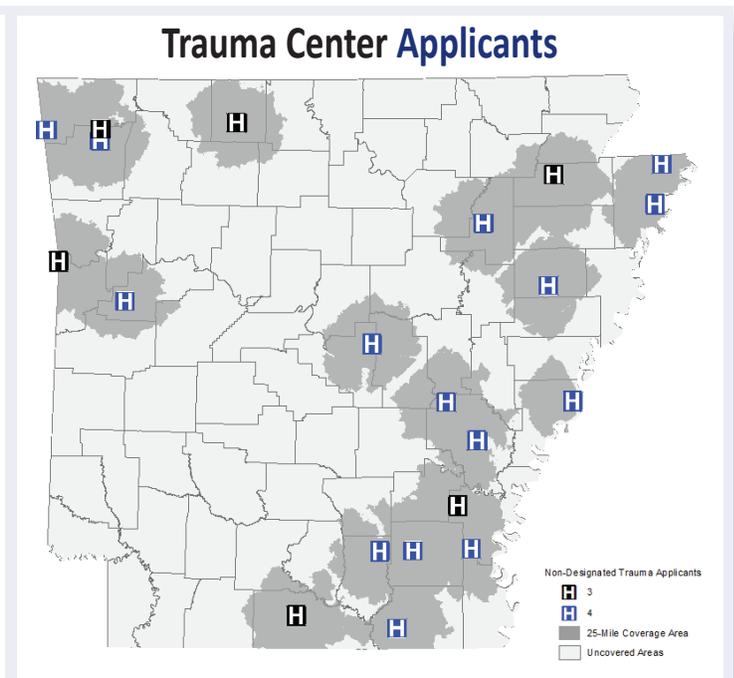
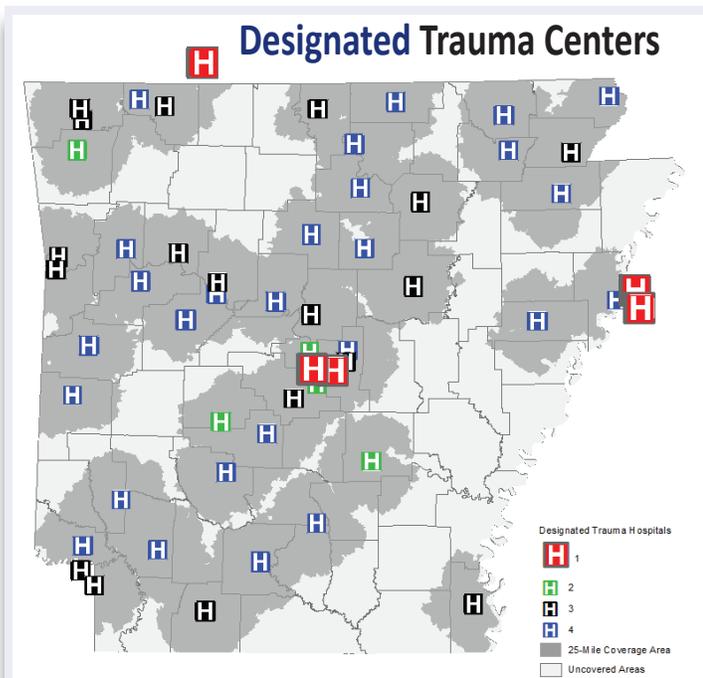
## and ACCESS TO QUALITY CARE

Before 2009, **Arkansas** was the **only state** without a designated trauma center.

A trauma center is a licensed hospital that has made additional commitments to provide immediate care to patients with life threatening injuries. These commitments include physicians, nurses, and support personnel with specific training and experience in the care of injured patients. Trauma centers must have additional equipment and systems in place to evaluate and stabilize critical trauma victims. The requirements to become a trauma center are rigorous and are not part of a hospital's usual requirements for licensure. National and international experience has demonstrated convincingly that state or regional systems that include many trauma centers at various levels, depending on their capability and capacity, have better outcomes than systems that have only a few high level tertiary trauma centers. This "best practice" model was the one chosen in the creation of the

Arkansas Trauma System, which includes four levels of trauma centers.

**One of the principal goals of the Arkansas Trauma System is to save lives and decrease preventable morbidity by getting the right patient to the right place as quickly and safely as possible.** This means identifying the most critically injured patients and directing them to comprehensive facilities when practical. When, at times, critically injured patients present to a level IV or III facility, the system is in place to facilitate rapid transport after initial stabilization. The system's secondary goal is to protect the resources of the comprehensive centers by directing less severely injured patients to the local community trauma centers which can successfully treat them.





## LEVEL I

Level I comprehensive trauma centers have 24/7 coverage with general surgeons, neurosurgeons, orthopaedic surgeons, and numerous other medical and surgical specialists trained and experienced in the care of critically injured patients. Specialized trauma care, such as intensive care monitoring, treatment of vascular, thoracic, hand, spine, and burn injuries is present in some comprehensive centers in the system. Level I centers also are required to have “in-house” surgeons, to train physicians and nurses in the treatment of trauma victims, and to perform trauma-related research. They are required to have general surgery residency programs and are equipped for community outreach and injury prevention programs. For fiscal year 2013, level I trauma centers will each receive \$1,410,000. This funding is to support trauma readiness and does not cover patient care cost.

## LEVEL II

Level II comprehensive trauma centers, like level I centers, also have 24/7 coverage with numerous medical and surgical specialists trained and experienced in the care of critically injured patients. The difference between level II and I is that level II centers are not required to have “in-house” surgeons to train medical staff in the treatment of trauma patients or to perform trauma-related research. For fiscal year 2013, level II trauma centers will each receive \$705,000.

## LEVEL III

A level III facility has consistent general surgical coverage and 24/7 operative capability. These facilities ideally have consistent orthopedic coverage and some have occasional neurosurgical coverage. The majority of patients presenting to these community trauma centers can be safely cared for in the center and do not require transfer. The level III center, however, has the process in place to stabilize and transfer the most severely injured patients to tertiary facilities. For fiscal year 2013, level III trauma centers will each receive \$176,250.

## LEVEL IV

A level IV trauma center exists in a small community hospital, where the expectation is that the trauma providers are knowledgeable in the initial evaluation, stabilization, and rapid transfer of critically injured patients to higher levels of care. Minor injuries can be cared for in these facilities that typically do not have general surgical, neurosurgical, or orthopedic coverage on a consistent basis. For fiscal year 2013, level IV trauma centers will each receive \$35,250.



To view a current list of the designated trauma hospitals, scan this QR code with the QR Reader App.



# TRAUMA REGISTRY



The Arkansas Trauma Registry (ATR) is an essential component of our statewide trauma system. It is the standardized data collection system for data elements that describe the injury event, demographics, pre-hospital information, diagnosis, care and outcomes of injured patients in all Arkansas trauma centers. It is also a source of data for research, needs assessments, and epidemiological and injury prevention activities.

## QUALITY IMPROVEMENT

The ATR will improve the performance of individual hospitals, trauma regions, and the statewide trauma system through the analysis of data for quality improvement (QI) activities. A Trauma Center QI and Patient Safety Plan has been developed as a template for hospitals needing to develop their internal QI plans, as well as the QI activities at the Trauma Regional Advisory Council (TRAC) and state levels. The statewide Trauma Stats and QI Filter Report has also been developed and reported back to individual hospitals and the TRACs.

The ATR was implemented July 1, 2010. Since then, 73 hospitals have entered over 25,000 records, providing detailed information on the treatment of injured patients received in Arkansas hospitals.

Quality improvement at the hospital level includes the review of registry statistics and audit filters, as well as the review of individual cases. At the state and TRAC levels, aggregate registry data is reviewed to look for systems issues that need to be addressed. Cases can also be reviewed if the case involves multiple providers or TRACs.

Opportunities for system improvement can be identified at any level and communicated as needed to affect system change.

### PATIENT DEMOGRAPHICS CY 2011

Race	Statewide	NTDB
White	81.50%	67.98%
Black	13.09%	14.35%
Asian	0.47%	1.62%
Other	4.90%	16.06%

Gender	Statewide	NTDB
Male	59.25%	63.23%
Female	40.47%	36.73%

Ethnicity	Statewide	NTDB
Hispanic/Latino	3.55%	10.99%
Non Hispanic/Latino	73.89%	56.46%
Unknown	11.28%	30.28%
N/A	11.27%	2.27%

Injury Type	Statewide	NTDB
Burn	2.51%	2.32%
Blunt	85.08%	83.56%
Penetrating	11.23%	9.23%
Unknown N/A	1.18%	4.89%

Age Groups (years)	Statewide	NTDB
0-19	22.02%	23.38%
20-44	29.78%	32.91%
45-64	23.28%	23.03%
65+	24.93%	20.68%

Age by mechanism - Statewide					
	0-19	20-44	45-64	65+	All
Fall	32.36%	13.92%	38.56%	75.45%	39.05%
Gunshot	3.73%	8.73%	2.93%	0.55%	4.24%
MVC	26.54%	34.68%	23.06%	12.10%	24.55%
Motorcycle	1.82%	6.23%	7.53%	1.27%	4.33%
Other	30.70%	27.59%	22.58%	9.11%	22.50%
Pedestrian	2.41%	1.83%	2.16%	0.64%	1.74%
Stabbing	1.85%	6.74%	2.76%	0.25%	3.12%

Age by mechanism - NTDB					
	0-19	20-44	45-64	65+	All
Fall	39.46%	15.66%	37.25%	75.13%	38.50%
Gunshot	4.16%	8.71%	2.36%	0.58%	4.50%
MVC	17.59%	29.19%	21.07%	12.83%	21.21%
Motorcycle	1.22%	6.84%	7.72%	1.03%	4.53%
Other	29.85%	27.13%	23.47%	7.64%	22.90%
Pedestrian	4.39%	3.70%	4.10%	2.13%	3.63%
Stabbing	3.33%	8.77%	4.03%	0.66%	4.73%

## THE SCORECARD

Registry data is also used for the Scorecard reported to the Governor's Trauma Advisory Council (TAC) and TRACs. The Scorecard provides an overview of patient demographics, injury types and mechanisms, injury distribution throughout the state, transfer patterns and times, and hospital information. An example of the Scorecard is depicted above.

# REHABILITATION

Rehabilitation is a vital part of any trauma system, and restoration of a patient having suffered traumatic injuries to normal function is an important system goal. Planning for patient rehabilitation begins immediately following arrival at the hospital. Rehabilitative efforts often begin during the hospital stay, and if needed, carry through to the patient's convalescence at a rehabilitation facility and even after re-entry into the community.

## ARKANSAS TRAUMA REHABILITATION CONFERENCE 2012

In order to enhance lines of communication among acute care, rehabilitation, and community-based healthcare providers, the 2012 Arkansas Trauma Rehabilitation Conference was hosted by Baptist Health Rehabilitation Institute on June 14-15, 2012. Speakers from Arkansas and Texas discussed topics such as an overview of the Arkansas Trauma System, specific treatment modalities, and the use of assistive technology. Approximately 150 people attended the conference.



The Baptist Health Rehabilitation Institute (BHRI) helps injured patients regain normal function after traumatic injury. Through the utilization of the BHRI therapy gym, rehabilitation therapists are able to assess multiple injury types for each patient.

## REHABILITATION ASSESSMENT

In 2011, the Arkansas Spinal Cord Commission conducted an assessment of trauma rehabilitation services available in Arkansas. This study showed that there are approximately 1,137 rehabilitation beds in the state, but that only 15 percent are designated for trauma patients. Thirty percent of the rehabilitation facilities held Commission on Accreditation of Rehabilitation Facilities certification, all used the Functional Independence Measure to predict outcomes, and all used a physician-led multidisciplinary treatment team. No rehabilitation facility in Arkansas provided rehabilitation to trauma patients on ventilators. Based on this report, the TAC established the Rehabilitation Subcommittee to oversee future recommendations to the ADH.

## STRATEGIC PLAN

The Rehabilitation Subcommittee developed a three-year strategic plan that was presented to and approved by the TAC. The 2012-2015 Strategic Plan, captioned "To Thrive, Not Just Survive," established the following four primary goals:

1. Ensure Arkansans who sustain traumatic, disabling injuries have access to high quality, comprehensive rehabilitation in our state;
2. Create a systematic approach to capture acute, rehabilitation, and community data metrics to determine areas of improvement in trauma patient outcomes;
3. Build the capacities of healthcare providers to deliver quality rehabilitative care;
4. Increase an individual's options to integrate successfully into the community.



# TRAUMA IMAGE REPOSITORY

## BURN *and* HAND INJURIES

Injured patients often require transfer from the initial hospital that provides stabilization to a definitive care facility that provides more specialized care. The key decisions made in the tertiary centers are often based on the information obtained from CT or MRI scanning.

Often, patients will have had CT or MRI scans performed in the initial treating facility. The information, ideally, came on a computer disc with the patient to the definitive care facility. A high percentage of the time, the discs were not sent, lost in transit, or unable to be opened at the receiving facility due to technical difficulties or incompatibility of the radiology systems. This delayed the patients receiving definitive care and most often lead to repeating the studies, increasing the radiation exposure and cost for the patient, and delaying treatment.

The Trauma Image Repository (TIR), a partnership between the ADH, the Arkansas Trauma Communications Center (ATCC), and the UAMS Center for Distance Health, was the answer to this dilemma. The TIR expanded the existing AR SAVES Telestroke Network and created a portal through which images can be sent from the first receiving hospital to the TIR. The Repository would then convert the image data into a universal format and make the information available to the tertiary receiving facility to upload into their system. This allows the specialist in the receiving hospital to view the films and begin to make clinical decisions and organize the care team far ahead of the patient's arrival. Thus, a patient can now be moved directly to the operating room of the treating facility.

### **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. The Repository pushed the films from a Level III Trauma Center to a Level I Trauma Center. The images were downloaded (within one minute) 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.

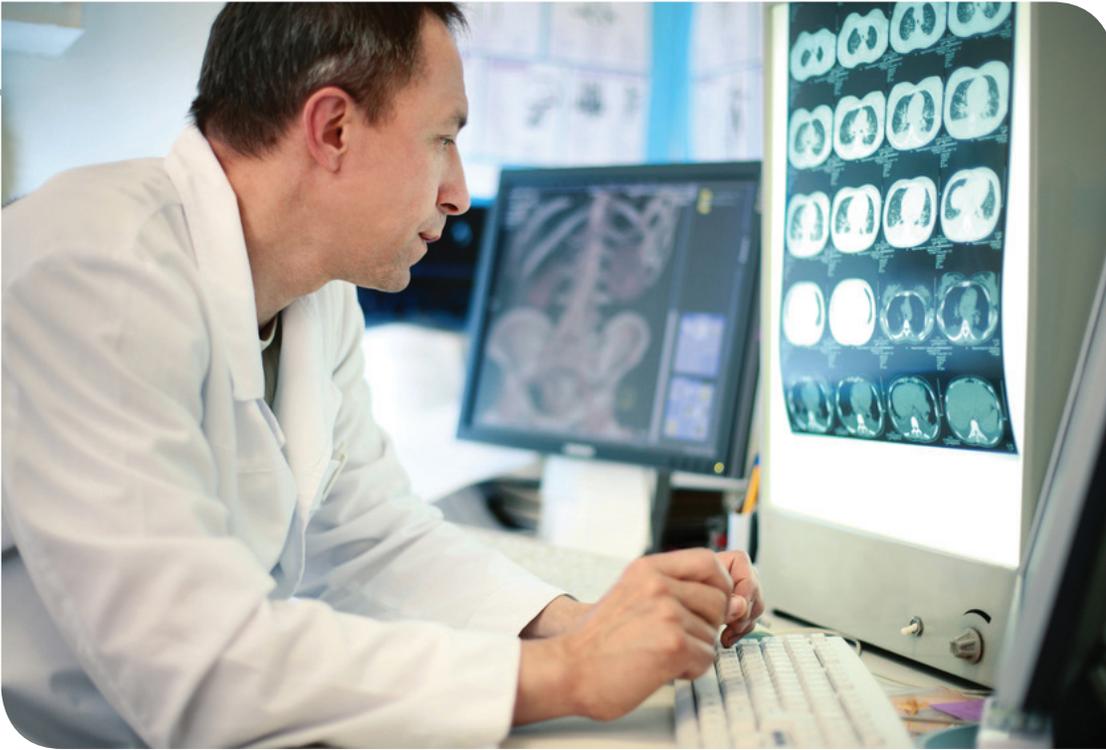
### **BURN INJURIES**

Arkansas patients suffer from burn injuries at a higher rate than the national norms. The death rates for burn in the state far exceed the national average. Injury prevention, outreach, and education are the primary tools used to combat this issue. Burn education and the increased use of smoke detectors in homes have also proven to decrease this burden. Once burned, however, there is only one center in the state dedicated to the care of adult and pediatric patients with serious burn injuries. The Burn Center at Arkansas Children's Hospital (ACH) has more than 450 admissions annually and sees numerous other patients on an outpatient basis. The care is extraordinarily complex.

The ACH Burn Center (which provides care to both adults and children) utilizes telemedicine to appropriately triage patients that can be cared for in their community with those that need urgent transfer to the Center. The telemedicine program also allows the physicians in the Burn Center the opportunity to assist the referring facility with initial stabilization and management of the critically burned patient prior to transfer. The Center's second mission, supported by the ADH, is education and outreach.

### **HAND INJURIES**

In a state heavily dependent on agriculture and manufacturing, Arkansas has a significant number of patients with serious hand injuries. Most hand injuries can and should be managed by the orthopaedic surgeons in the community hospitals of Arkansas. Occasionally the patient's injuries are such that a specialist in hand care is needed for consultation or immediate assistance with treatment. The ATCC is organizing a group of hand surgeons who have agreed to serve in a "virtual call group," evaluating injuries through use of telemedicine and assisting the ATCC with an appropriate triage plan. The goal of the program is to get patients with urgent needs to a facility capable of providing appropriate care in a timely manner. Conversely, the secondary goal is to provide reliable referral and follow up for patients with less urgent needs to decrease the burden of urgent transfers that our system now faces.



# QUALITY IMPROVEMENT

The ultimate goal of the trauma Quality Improvement (QI) process is to reduce mortality and morbidity in the trauma patient population. The QI process is overseen by the QI/Trauma Regional Advisory Councils (TRACs) Subcommittee of the Governor's Trauma Advisory Council (TAC). Each TRAC also has a QI group that deals with these issues at the regional level. The goal is for QI issues and concerns related to patient care to be reviewed and resolved at the regional level. However, if the issues are particularly egregious or involve a statewide issue, they may be referred directly to the QI Subcommittee of the TAC.

At this point, this state-level QI group will interview core providers, review medical data, and make recommendations for QI and patient safety. It is important to note that all QI Subcommittee proceedings, both at the regional and state levels, are by statute confidential in nature and are not subject to the state's Freedom of Information Act or subpoena through the judicial process.

The trauma system also includes a Quality Improvement Organization (QIO) that is responsible

for reviewing and verifying data submitted by trauma care providers. Once data is confirmed, the QIO will identify opportunities for improvement at the provider level (e.g. hospitals and ambulance services), which will ultimately lead to improvement in patient care.

**“Quality improvement is where the rubber meets the road. Problems associated with patient care are identified and resolved, which will benefit all Arkansas citizens in the end.”**

Dr. Charles Mabry  
Chair, QI/TRACs Subcommittee  
Governor's Trauma Advisory Council

Injury is the leading cause of death for Arkansans aged 1-44.

# INJURY PREVENTION

## and EVIDENCE-BASED PROGRAMS

The Arkansas Legislature included injury prevention as an important part of the trauma system. To this end, the ADH Injury Prevention Section collaborates with stakeholders to ensure that evidence-based prevention programs are in place. One example is through establishment of the Statewide Injury Prevention Program (SIPP), a partnership with the Injury Prevention Center at Arkansas Children's Hospital, where subject matter experts provide technical assistance across the state. Another is the enhancement of ADH's Hometown Health Initiative resources so that there are grassroots and community-level interventions being conducted. Finally, creation of the Injury Community Planning Group (ICPG) brings state-level leadership in all aspects of injury prevention to the table to ensure coordination of efforts, plan core activities, and evaluate programs. A recent success of the above collaborative efforts involved the ADH's distribution of approximately 4,800 child passenger safety seats throughout the state and their installation by certified technicians.

The Primary Seatbelt Law, established in 2009, has been very effective in getting more Arkansans to buckle up. Since the passage of the primary seatbelt law, seatbelt usage in Arkansas has increased eight



**“Well-conceived injury prevention initiatives on the front end will save more lives than the surgeon will ever be able to do after the fact.”**

**Dr. Todd Maxson, Pediatric Surgeon,  
Arkansas Children's Hospital, Trauma  
Medical Consultant to ADH**

percentage points over a two-year period. Although the law is credited with significantly increasing seatbelt use throughout the state, seatbelt usage in Arkansas is still seven percentage points lower than the national average.

The Graduated Drivers License (GDL) was expanded in 2009 by Act 394 to allow teens to gain driving experience through the use of restrictions for optimal risk reduction. GDL limits age, night-time driving, passengers, and cell phone use for teens. According to the Arkansas Center for Health Improvement (ACHI), there was a significant decrease in the annual number of crashes for teen drivers following the passage of GDL. Fatalities involving teen drivers were reduced by 59 percent between 2008 and 2010, translating to an estimated 32 lives saved.

# A LESSON LEARNED

Personal Narrative by **Gregory G. Mann, PA-C**



I stand 69 inches tall (I thought for sure I stood 70 inches 10 years ago... but that is a subject for another article) and this morning I weighed 194.4 pounds. My son, Sebastian, measures 49 inches tall and weighs 64.4 pounds. So, I am about average for an adult male and Sebastian is an average size for a nine-year-old boy. Keeping this picture of the size difference between a father and his young son will be important as you read on.

I had the privilege this weekend of hearing Dr. Todd Maxson, the chief trauma surgeon at Arkansas Children's Hospital, speak about Advanced Trauma Life Support. Though he taught me a great deal, the most important lesson I learned from him was that a man's body is bigger than a boy's. This fact is not only obvious but is also extremely important in pediatric trauma.

When Sebastian and I are camping, I can hear him asking, "Dad, Dad, can I throw sticks in the fire?" My answer could be different if I stopped to think that if I fell into a camp fire, 20 percent of my large body would get burned. But, if Sebastian fell into a camp fire, he could sustain burns on as much as 50 percent of his body.

When Sebastian and I are bike riding around the neighborhood, I can hear him asking, "Dad, Dad, do I have to wear a helmet?" My answer could change if I stopped to think that if I get hit by a moving car, the bumper impacts my leg and hip and knocks me onto the hood. But, if Sebastian is hit by a moving vehicle, he receives a major blow to his head and falls underneath.

When Sebastian and I are fishing, I can hear him asking, "Dad, Dad, do I have to wear a life jacket?" My answer could depend on if I stopped to think that if I fall into the water without a life jacket, my large body floats and resists the current. But, if Sebastian falls into the water without a life jacket, his leaner body sinks and his smaller frame is swept away by the current.

When Sebastian begs me, "Dad, Dad, can I ride the ATV?" my answer could change if I stopped to think that if an ATV rolls over onto me, my large mass absorbs and distributes the force away from my vital organs. But if an ATV rolls over onto Sebastian, the vital organs in his small body receive a massive and damaging blow.

When Sebastian and I are driving just down the street to the corner store, I can hear him asking, "Dad, Dad, can I sit in the front seat?" My answer could be different if I stopped to think that in the event of a head on collision the car's airbag would strike my taller body in the chest. But, when the airbag deploys on the passenger side, the strength of impact collides with Sebastian's head, pushing his neck backwards to the point of severe injury.

So, Dr. Maxson's lesson seems as wise and far reaching as obvious. Fifty percent of the children who die in Arkansas each year are killed in accidents. A small number of these deaths are the result of unforeseeable and tragic circumstances. However, most deadly accidents involving children are predictable and preventable.

So the next time I hear Sebastian asking, "Dad, Dad, can I..." how will I answer him? My goal as a father is to answer my son in a way that will protect and preserve his small body and prevent me from having to see Dr. Maxson... in the surgery waiting room of the Arkansas Children's Hospital.

Gregory G. Mann is a certified physician assistant working at the ARcare clinic in McCrory. He would like to thank all of the instructors, staff and supporters of the Arkansas Trauma Education and Research Foundation ([www.aterf.org](http://www.aterf.org)).



# Arkansas TRAUMA EDUCATION and RESEARCH FOUNDATION

The Arkansas Trauma Education and Research Foundation (ATERF) is a non-profit corporation formed in 2011. The central mission of ATERF is to facilitate the provision of trauma education courses for pre-hospital providers, nurses, mid-level providers, and physicians in an effort to improve the delivery of care to Arkansas trauma patients. Recognizing that education is a critical component of a statewide trauma system, the Trauma Section of the ADH sought a contractor to implement a comprehensive and organized trauma education plan for the state. ATERF was awarded the contract and began operations on February 1, 2012, executing a statewide, systematic trauma education plan. In order to successfully provide education throughout the state of Arkansas, a decentralized approach to delivery of the courses is used with centralized coordination and oversight to ensure quality, availability, and appropriate record keeping.

ATERF is a coalescence of groups of individuals that deliver trauma education either as part of an organized group or as individuals. The lead instructors and

subject matter experts in Arkansas have merged to form the Foundation in order to offer trauma education that is needed and necessary for care providers in the Arkansas Trauma System. The goal of the Foundation is to provide this education with a focus on quality and access.

During its first seven months of operation, ATERF conducted 45 courses with more than 700 health care professionals participating in the courses. The 45 courses were conducted in 25 Arkansas cities and towns throughout the state. Course participants included over 250 physicians, 350 nurses, and 100 EMS providers. The participants were residents of 60 different Arkansas counties. ATERF will continue to provide trauma education to all four corners of the state of Arkansas from Bentonville to Lake Village, Piggott to Texarkana, and all points in between.



Dr. Todd Maxson, trauma surgeon for Arkansas Children's Hospital, leads discussion during the Rural Trauma Team Development Course.



Physicians participate in a course on Advanced Surgical Skills for Exposure in Trauma in order to gain knowledge of key anatomical exposures for the care of injured and acutely ill surgical patients.



ATERF offers a variety of courses, including Disaster Management Training, Trauma Performance Improvement, Trauma Nurse Core Courses, Focused Abdominal Sonography for Trauma, Advanced Surgical Skills for Exposure in Trauma, Prehospital Trauma Life Support, Basic Trauma Coordinator Course, and Advanced Trauma Life Support.

# Some Closing Thoughts

## IMPORTANCE OF PREVENTION IN REDUCING INJURY MORTALITY

Although we've made remarkable progress in putting together the Arkansas Trauma System, trauma is still a leading cause of death and disability in our state. As a practicing emergency physician, I am frequently reminded that the best treatment for injury is clearly prevention. Once a serious injury has occurred, our system is doing a better job of treatment, but I am always reminded that it would have been far better to have prevented it in the first place. This is why I am so pleased that the trauma system is placing a major emphasis on injury prevention.

We know that lives can be saved and disability prevented through injury prevention. The implementation of evidence-based strategies, community level prevention programming, workforce development and proven interventions such as seat belts, child safety seats, and home smoke detectors will make an enormous difference in reducing injury mortality. The Arkansas Trauma System has established a Statewide Injury Prevention Program which is working with local trauma center hospitals, ambulance services, county health units, and a variety of community groups throughout the state to promote injury prevention.

We still have a great deal of work to do, but I believe that the steps that have been taken will set us on the right course to make our trauma system one of the best. By emphasizing prevention of injury we will save lives and treatment costs. It is a wise investment!! The best treatment is prevention, and our Arkansas Trauma System is on the right path toward preventing death and injury.



James Graham, MD  
Chairman, Trauma Advisory Council  
Pediatric Emergency Medicine Specialist  
University of Arkansas for Medical Sciences

# TRAUMA SYSTEM

## A SYSTEM SAVING LIVES

It has been the most exciting three years of my professional life to be in Arkansas and see the incredible opportunity of creating a trauma system come to fruition. There has not been, and will probably never be again, an opportunity to have such a varied group of stakeholders come together so supportive of a single initiative that has such an impact on the state. This is certainly what drew me back to Arkansas and I have been thrilled with the incredible results. I have also taken great pride in the national recognition that our state's trauma system has received in the past year since the results of our collective efforts have been acknowledged on the national scale.

I have had the great pleasure of working with trauma centers and systems all over the country and have never seen the rapid growth and success that we have seen in Arkansas. I believe that because of the leadership of the Arkansas Department of Health and the Governor's Trauma Advisory Council, we have utilized the resources given to the system to their utmost, allowing for the tremendous, rapid success.

The American College of Surgeons, the national authority on trauma system development, has recognized the Arkansas system in almost every trauma venue in the last year, pointing to the success in our designation program, call center, education efforts, and quality improvement process. Our success has led to multiple requests from other states to help in the refinement of their systems and has given Arkansas the opportunity to participate in many pilot programs on the national level, such as the College's Trauma Quality Improvement Program, where Arkansas outcome data will be used to benchmark success nationally.

Members of the Arkansas Trauma System community are now active participants in many important national trauma committees. Arkansas, its new trauma system, and the dedicated men and women who work every day to keep our citizens safe and treat our injured are breaking new ground and making news nationally for their efforts. I am thrilled and grateful to be part of this process and am as excited about the successes we will have in the next three years as I have been about the success of the last three years.



Todd Maxson, MD  
Pediatric Trauma Surgeon,  
Arkansas Children's Hospital  
Trauma Medical Consultant to the Arkansas  
Department of Health

# EXCEPTIONAL PROGRESS

## IN IMPLEMENTING THE SYSTEM



The passage of the Trauma System Act in 2009 was the result of hard work by many people. If I were to try to mention them all here I would inevitably leave someone out. You know who you are and the people of Arkansas are truly in your debt. I believe the legislators who supported the bill, as well as all Arkansans, can be extremely proud of what has been accomplished in the short time since system implementation began. We now have 58 designated trauma centers throughout the state and expect this number to grow to over 70 by April 2013. A call center, to include a statewide communications system, is now operational, trauma education has been vastly increased, and injury prevention efforts are underway in all parts of the state. These are only a few of the initiatives the Arkansas Department of Health (ADH) has put in place during the past three years.

I would be remiss if I did not extend a special thanks to Dr. James Graham and the rest of the members of the Governor's Trauma Advisory Council. This group of dedicated professionals has worked tirelessly to provide the ADH with outstanding advice and guidance as we work together to create an exceptional trauma system. As confirmed during an American College of Surgeons visit in 2011, we have collectively made exceptional progress in implementing the system and I am proud to be associated with this effort.



Paul K. Halverson, DrPH, FACHE  
Director and State Health Officer  
Arkansas Department of Health



**Arkansas Department of Health**  
*Keeping Your Hometown Healthy*



# REFERENCES

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**American College of Emergency Physicians**

[www.acep.org](http://www.acep.org)

**Arkansas Children's Hospital Injury Prevention Center**

[www.archildrens.org/services/Injury-Prevention-Center](http://www.archildrens.org/services/Injury-Prevention-Center)

**Arkansas Department of Health Injury Prevention and Control**

[www.healthy.arkansas.gov/programsServices/InjuryPreventionControl](http://www.healthy.arkansas.gov/programsServices/InjuryPreventionControl)

**Arkansas Highway and Transportation Department**

[www.arkansashighways.com](http://www.arkansashighways.com)

**Arkansas State Police**

[www.asp.state.ar.us](http://www.asp.state.ar.us)

**CDC Injury and Violence Prevention**

[www.cdc.gov/injury](http://www.cdc.gov/injury)

**CDC Injury Prevention & Control: Motor Vehicle Safety**

[www.cdc.gov/motorvehiclesafety](http://www.cdc.gov/motorvehiclesafety)



To view the Trauma System Act,  
scan this QR code with the QR  
Reader App.

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