

The Arkansas Trauma System

Act 393 of 2009



1

The Beginning



- Arkansas' overall injury fatality rate was 50% higher than the national average. (2008 data from the American College of Surgeons)
- Hospital to Hospital transfers could take hours to arrange for trauma patients.
- Arkansas' emergency care system was the worst in the nation. (National Report Card of the State of Emergency Medicine, December 2008)
- Arkansas was one of three states without a trauma system and the only state without a designated trauma center.

2

Trauma System Funding



- For FY23 ADH budgeted \$26,154,931:
 - 52% of funding for Designated Hospitals and EMS
 - 33% of funding for Contracts and Services
 - 8% of funding for Stroke/STEMI System
 - 7% of funding for ADH Trauma Operations

3

Trauma System??



- Trauma is the leading cause of death in the patient population of those 46 and younger in the US. (Choi et al., 2021)
- Trauma System is defined as an organized and coordinated plan within a state that is integrated with the local public health system and delivers the full range of care patients with severe or life-threatening injuries.
- Trauma Centers are defined as a hospital which has received designation certification after successfully completing a rigorous site survey to determine, based on resource availability and overall capability, the appropriate level of designation.

The Arkansas Trauma System ArcGIS StoryMaps. Published December 6, 2022. Accessed May 17, 2023
<https://storymaps.arcgis.com/stories/1b04c480b6824946989d8e43778f96c4>

4

Trauma Center Levels



- Level I – comprehensive clinical care and community resource (education, research and outreach)
 - Six Level I Hospitals
- Level II – comprehensive clinical care
 - Four Level II Hospitals
- Level III – treatment of mild and moderate single system injuries
 - 18 Level III Hospitals
- Level IV – stabilization and transfer
 - 29 Level IV Hospitals

The Arkansas Trauma System. ArcGIS StoryMaps. Published December 6, 2022. Accessed May 17, 2023. <https://storymaps.arcgis.com/stories/1b04c480b682494b689d8e43778f96c4>

5

Arkansas Trauma System Components



1. Pre-hospital services (911, ambulances)
2. Trauma Communications
 - Arkansas Trauma Communications Center
 - Trauma Image Repository
3. Designated Trauma Centers
 - 57 currently designated trauma centers in Arkansas
4. Rehabilitation
5. Trauma Registry (collection and analysis of data)
6. Quality Improvement
 - Preventable Mortality Studies
7. Injury Prevention Programs
 - Suicide Prevention/National Suicide Hotline

6

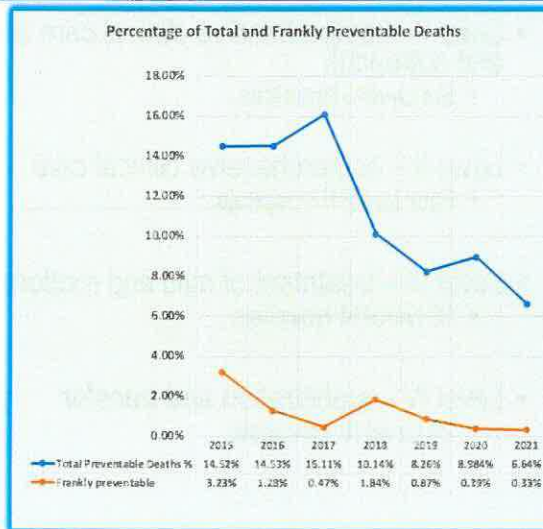
Results of the Trauma System



Table 4: Distribution of Decedents Mortality and OFI

Category	Pre-TS 2009		Post-TS 2013-14		% Reduction in Preventable Mortality Pre-TS vs Post-TS
	Number	Percentage	Number	Percentage	
Frankly preventable	25	9%	12	3%*	6%
Possibly preventable	61	21%	49	13%**	8%
		30%		16%	

p = .006. **p = .017



Porter, A., Kanim, S., Bowman, S. M., Recicar, J., Bledsoe, G. H., & Maxson, R. T. (2018). Impact of a statewide trauma system on the triage, transfer, and inpatient mortality of injured patients. *The journal of trauma and acute care surgery*, 84(5), 771-779. <https://doi.org/10.1097/TA.0000000000001825>

7

Healthcare Results



Table 5. Percent of Preventable Mortality Pre-TS vs. Post-TS Extrapolated

Post-TS 2013-14	Number	Total Preventable Mortality (30%) Pre-TS	Total Preventable Mortality (16%) Post-TS	Projected Reduction in Preventable Deaths Pre-TS to Post-TS
Total Deaths with Study Selection Criteria in Post-TS Timeframe	564	169	90	79

Table 6: Calculation of Impact of Reduction of Preventable Trauma Deaths Using Value of Life Lost (VLL)

Average Age	Life Expectancy	Total Deaths Prevented	Life Years Gained	Value of a Life Year	3% Discounted Present Value of Life	Societal benefit—90 lives saved
42	81.5	79	39.5	\$100,000	\$2,365,151	\$186,846,890
42	81.5	79	39.5	\$200,000	\$4,730,301	\$373,693,779
42	81.5	79	39.5	\$300,000	\$7,095,452	\$560,540,669

Maxson, T., Mabry, C. D., Sutherland, M. J., Robertson, R. D., Booker, J. O., Collins, T., Spencer, H. J., Rinker, C. F., Sanddal, T. L., & Sanddal, N. D. (2017). Does the Institution of a Statewide Trauma System Reduce Preventable Mortality and Yield a Positive Return on Investment for Taxpayers?. *Journal of the American College of Surgeons*, 224(4), 489-499. <https://doi.org/10.1016/j.jamcollsurg.2016.12.042>

8

Most Common Preventable Mortality Errors:



1. Recognition of injury severity
2. Identification and prioritization of treatment for immediate life-threatening injuries
3. Rapid decision of need for transportation to a higher level of care / use of ATCC
4. Clear communication early on with EMS / Air about quickest transport method to higher level of care
5. Proper management of shock, air way/ ventilation, damage control, and head injuries
6. Delay in transfer due to unnecessary tests

Porter, A., Karim, S., Bowman, S. M., Recicar, J., Bledsoe, G. H., & Maxson, R. T. (2018). Impact of a statewide trauma system on the triage, transfer, and inpatient mortality of injured patients. *The journal of trauma and acute care surgery*, 84(5), 771–779. <https://doi.org/10.1097/TA.0000000000001825>

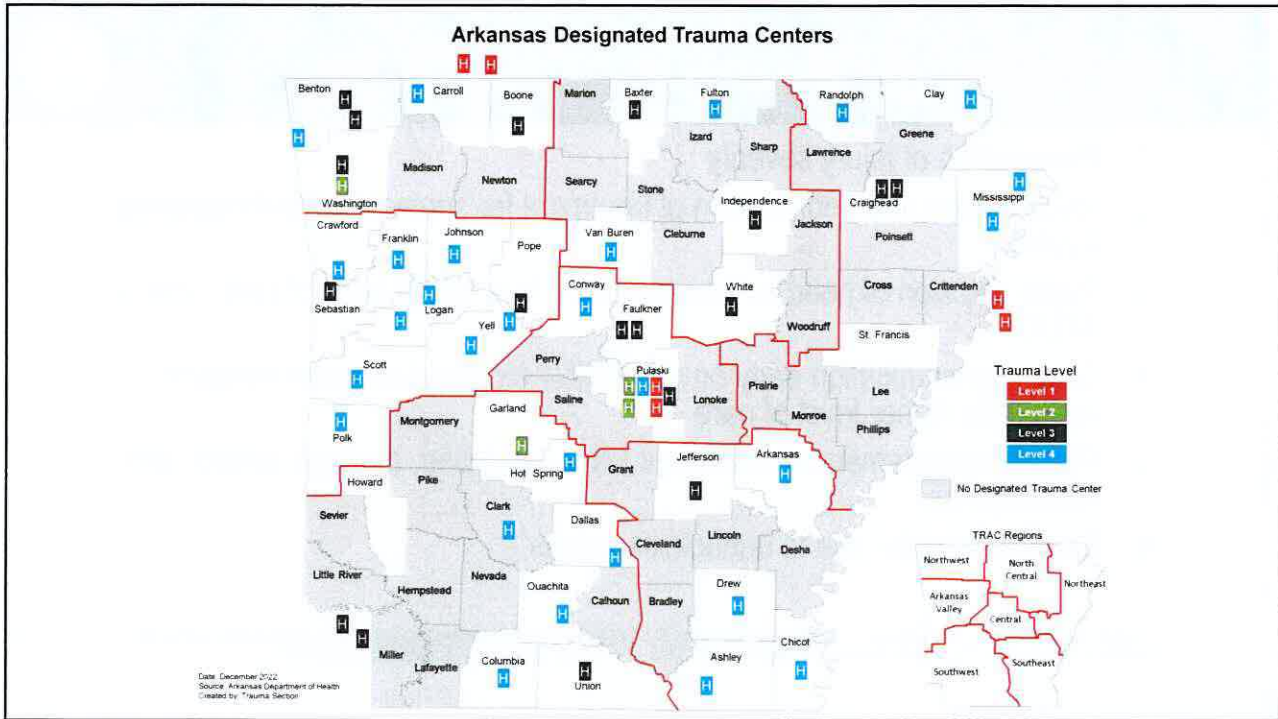
9

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10



11

Hospital Name	City/State	Designation Date	Hospital Name	City/State	Designation Date
Level I (6)*			Level IV (29)		
Arkansas Children's Hospital (ACH)	Little Rock, AR	11-Oct-21	Arkansas Children's Hospital – Northwest	Springdale, AR	13-Jan-23
CoxHealth	Springfield, MO	15-Feb-22	Arkansas Methodist Medical Center	Paragould, AR	30-May-12
Le Bonheur Children's Hospital	Memphis, TN	17-Jun-21	Ashley County Medical Center	Crossett, AR	22-Feb-13
Mercy Hospital Springfield - Adult Trauma Center	Springfield, MO	4-Nov-21	Baptist Health Medical Center– Arkadelphia	Arkadelphia, AR	21-Jul-15
Regional Medical Center	Memphis, TN	10-Feb-22	Baptist Health Medical Center – Hot Spring County	Malvern, AR	10-Nov-21
University of Arkansas for Medical Sciences (UAMS)	Little Rock, AR	13-Nov-19	Baptist Health Medical Center – Stuttgart	Stuttgart, AR	7-Oct-19
Level II (4)*			Baptist Health – Van Buren	Van Buren, AR	27-Jun-22
Baptist Health Medical Center	Little Rock, AR	29-Mar-22	CHI St. Vincent Morrilton	Morrilton, AR	11-Sep-21
CHI St. Vincent Hospital Hot Springs	Hot Springs, AR	17-Mar-22	CHI St. Vincent North Little Rock	North Little Rock, AR	14-Jul-21
CHI St. Vincent Infirmary	Little Rock, AR	14-Dec-23	Chicot Memorial Medical Center	Lake Village, AR	14-Feb-22
Washington Regional Medical Center	Fayetteville, AR	25-Apr-22	Dallas County Medical Center	Fordyce, AR	3-Aug-22
Level III (18)*			Dardanelle Regional Medical Center	Dardanelle, AR	5-April-22
Baptist Health – Conway	Conway, AR	7-Jan-20	Drew Memorial Health System	Monticello, AR	30-Sept-22
Baptist Health Medical Center – NLR	North Little Rock, AR	17-Sept-21	Eureka Springs Hospital	Eureka Springs, AR	6-May-22
Baxter Regional Medical Center	Mountain Home, AR	14-Oct-21	Fulton County Hospital	Salem, AR	28-Sept-21
Christus Saint Michael Health System	Texarkana, TX	22-Jul-21	Great River Medical Center	Blytheville, AR	10-Oct-22
Conway Regional Medical Center	Conway, AR	8-Oct-21	John Ed Chambers Memorial Hospital	Danville, AR	4-Aug-21
Jefferson Regional Medical Center (JRMC)	Pine Bluff, AR	11-Nov-21	Johnson Regional Medical Center	Clarksville, AR	23-Aug-21
Johnson Regional Medical Center	Clarksville, AR	23-Aug-21	Magnolia Regional Medical Center	Magnolia, AR	8-Dec-21
Medical Center of South Arkansas	El Dorado, AR	13-Jul-21	Mena Regional Health System	Mena, AR	11-Apr-22
Mercy Hospital Fort Smith	Fort Smith, AR	1-Aug-22	Mercy Hospital Booneville	Booneville, AR	5-Aug-22
Mercy Hospital Northwest Arkansas	Rogers, AR	06-Apr-22	Mercy Hospital Ozark	Ozark, AR	27-Oct-21
NEA Baptist Health System	Jonesboro, AR	24-Jun-21	Mercy Hospital Paris	Paris, AR	24-Sept-21
North Arkansas Regional Medical Center	Harrison, AR	5-Feb-20	Mercy Hospital Waldron	Waldron, AR	31-Dec-21
Northwest Medical Center-Bentonville	Bentonville, AR	6-Apr-22	Ouachita County Medical Center	Camden, AR	29-Oct-21
Northwest Medical Center-Springdale	Springdale, AR	5-Jan-22	Ozark Health Medical Center	Clinton, AR	1-Apr-22
Saint Mary's Regional Hospital	Russellville, AR	24-Aug-21	Siloam Springs Regional Hospital	Siloam Springs, AR	3-July-19
St. Bernards Medical Center	Jonesboro, AR	22-Jul-19	South Mississippi County Regional Medical Center	Osceola, AR	11-Oct-22
Unity Health White County Medical Center	Searcy, AR	01-Oct-21	St Bernards Five Rivers Medical Center	Pocahontas, AR	31-May-23
Wadley Regional Medical Center	Texarkana, TX	22-Mar-22			
White River Medical Center	Batesville, AR	01-Jan-22			

12