TRAUMA PERFORMANCE IMPROVEMENT
UAMS TRAUMA PROGRAM
UNIVERSITY OF ARKANSAS FOR MEDICAL SCIENCES
2023

I. Philosophy of the Trauma Program

The University of Arkansas for Medical Sciences (UAMS) is Arkansas's only academic health center. It is the only ACS Verified and Arkansas-designated Adult Level I Trauma Center. It has a tri-fold mission of education, patient and family-centered healthcare, and advancing knowledge through research to impact the care of patients.

To accomplish these goals, UAMS requires strong leadership with authority to coordinate the inter-professional team for patient care, to coordinate injury prevention programs, and to direct research activities that will impact the future direction of adult trauma care in the country.

Trauma Clinical Care is under the direction of Trauma Medical Director Kyle J Kalkwarf, M.D., Associate Professor, UAMS Department of Surgery.
The UAMS Division of Acute Care Surgery is under the direction of Benjamin Davis, M.D., Associate Professor, UAMS Department of Surgery. Our research team is committed to the alleviation of suffering. We support a triple-aimed research program focusing on clinical, translational, and molecular research, including trauma, emergency general surgery, and surgical critical care. We believe successful science requires collaboration between researchers and many interprofessional healthcare providers.

II. Mission and Vision of the Trauma Performance Improvement Plan

A. The Trauma Program at UAMS is committed to quality patient care, performance improvement and patient safety, outreach and prevention programs, continuing education, and research.
B. The Trauma Program ensures the maintenance of a formal, validated, internal performance improvement process that allows for a multidisciplinary approach for rapid problem identification, data-driven analysis, and resolution of issues within the quality framework of our institution.
C. Our mission is to deliver high-quality care through evidence-based, state-of-the-art medical practice driven by a performance improvement process and facilitated by examination of data and peer review at all levels of patient care delivery.
D. In 2012, UAMS became part of the American College of Surgeons Trauma Quality Improvement Program (ACS TQIP). By utilizing ACS TQIP, UAMS is elevating the quality of care being delivered by inter-professional team members through risk-adjusted benchmarking based on national comparisons.

III. Authority and Scope

As the only ACS Verified and State Designated Level 1 Adult Trauma Center, UAMS

Medical Center provides 24-hour tertiary care to adult trauma patients. An adult trauma patient is any patient over 15 years old who sustained an injury and requires admission to UAMS. The University of Arkansas Board of Trustees and UAMS Medical Staff strongly support this verification/designation by documented resolution, which is reaffirmed every three years.

The Trauma Program Medical Director (TMD) is responsible for the oversight and authority of the trauma center's trauma care, credentialing of trauma surgeons and participating liaisons, trauma registry, injury prevention, and outreach education. The TMD is responsible for the trauma performance improvement and patient safety plan development, implementation, and evaluation of the trauma program's outcomes in collaboration with the Trauma Program Director (TPD).

Key responsibilities include:

- Provides the authority and oversight for the trauma center through all phases of trauma care
- Establishes evidence-based guidelines and compliance with national standards of care
- Chairs the Trauma Multidisciplinary Peer Review and Operational Steering Committee
- Reports the statistical performance, trauma performance improvement, and patient safety outcomes annually to the UAMS Quality, Experience, and Safety Team (QUEST) Committee, which reports to the Hospital Medical Board.

IV. Credentialing

All physicians who care for injured patients will be credentialed according to the Medical Staff Bylaws. The TMD has the authority to set additional criteria and to recommend changes to the trauma call panel based on performance review.

The TMD must coordinate reappointment to the trauma admitting/consulting staff with liaisons from neurosurgery, orthopedic surgery, emergency medicine, radiology, anesthesia, critical care, and other appropriate disciplines. Reappointment will be based on the following criteria:

- Maintenance of good standing in the primary specialty
- Evidence of compliance with divisional protocols or guidelines
- Documentation of attendance at multidisciplinary conferences
- Satisfactory performance in managing trauma patients based on annual OPPE
- All certifications must be maintained continuously
- All members of the Acute Care Surgery team must maintain at least provider-level Advanced Trauma Life Support (ATLS) certification
- The Trauma Program Director, in collaboration with the Nursing Directors, is responsible for overseeing the credentialing and continuing education of nurses working with trauma patients, including the Trauma Nursing Core Course (TNCC) and trauma-specific continuing education developed by the Trauma Program

V. Trauma Patient Monitoring Process

A. Trauma Patient Population Criteria

The UAMS Trauma Program has adopted the Arkansas Trauma Registry (ATR) Inclusion Criteria. All patients meeting the following inclusion criteria are included in the trauma registry. The Arkansas Trauma Registry Inclusion criteria includes:

At least one of the following injury diagnostic codes defined in the International Classification of Diseases, Tenth Revision, Clinical Modification (ICD-10-CM): S00-S99 with 7th character modifiers of A, B, or C only (injuries to specific body parts-initial encounter)

- T07 (unspecified multiple injuries)
- T14 (injury of unspecified body region)
- T20-T28 with 7th character modifier of A only (burns by specific body parts – initial encounter)
- T30-T32 (burn TBSA percentages)
- T79.A1-T79.A9 with 7th character modifier of A only (Traumatic
- Compartment Syndrome-initial encounter)
- T59.811A-T59.814A (smoke inhalation)
- T7500XA-T750.1XA (lightning)
- T75.1XXA (drowning)
- T71.111A-T71.114A, T71.121A-T71.124A, T71.131A-T71.134A,
- T71.141A-T71.144A, T71.151A-T71.154A, T71.161A-T71.164A,
- T71.191A-T71.194A, T71.20XA-T71.21XA, T71.221A-T71.224A,
- T71.231A-T71.234A, T71.29XA, T71.9XXA (Asphyxiation)
- T75.4XXA (electrocution)
- W54.0XXA (dog bite)
- T63.001A (snakebite)

Excludes the following isolated injuries:

- S00 (Superficial injuries of the head)
- S10 (Superficial injuries of the neck)
- S20 (Superficial injuries of the thorax)
- S30 (Superficial injuries of the abdomen, pelvis, lower back and external genitals)
- S40 (Superficial injuries of the shoulder and upper arm)
- S50 (Superficial injuries of the elbow and forearm)
- S60 (Superficial injuries of the wrist, hand, and fingers)
- S70 (Superficial injuries of the hip and thigh)
- S80 (Superficial injuries of the knee and lower leg)
- S90 (Superficial injuries of the ankle, foot, and toes)

And must include one of the following in addition to the ICD-10-CM:

- Hospital Admission
- Patient transfer via EMS transport (including air ambulance) from one hospital to another hospital
- Death resulting from the traumatic injury (independent of hospital admission or hospital transfer status)
- Excludes planned readmits or admits via the clinic

Other System Inclusion Criteria:

- All full trauma team activations involving the utilization of a trauma surgeon
- Any admission post-ED/hospital discharge that occurs as a result of missed injuries or delayed diagnosis
- Any acute care hospital to acute care hospital trauma transfer via EMS

Please note: The Arkansas Trauma Registry Inclusion Criteria and the National Trauma Data Bank Inclusion Criteria differ. Cases that do not meet the National Trauma Data Bank inclusion criteria will be excluded from the submission to the National Trauma Data Bank by marking it for exclusion in the NTDS module of the V5 registry.

B. Patient Identification

The Trauma Clinical Coordinators review the ED Transfer log, and EPIC reports each business day to identify trauma patients. The review will capture transfers, admissions, and discharges through the ED, review of direct admissions, and review of inpatient discharges. The aforementioned Trauma Registry Criteria determines if a case applies to the registry.

C. Data Collection

For each identified patient, a hand abstraction tool is initiated. Data collection includes all NTDB data elements, ATR data elements, and selected UAMS data elements. Data collection is guided by the NTDB data dictionary with supplements from the ATR Data Dictionary and UAMS Data Dictionary. Additionally, the concurrent data abstraction includes our first level of PI review.

The Trauma Registry Abstract form is designed to collect required registry information, serve as a PI screening tool, and provide space to record essential clinical information for clinical case management purposes. Data sources for the collection of this information include:

- Electronic Medical Record (EPIC), which includes physician notes, nursing notes, allied health notes, lab results, and radiologic reports
- Prehospital EMS Record
- Referring to the Hospital Medical Record
- Medical Examiner Reports
- Clinical rounds

Upon discharge, the Trauma Clinical Coordinators will ensure the completion and accuracy of abstracted data and PI information before handing the abstract tool to the Trauma Registrars.

D. Data Entry and Validation:

Based on a patient list collated by the Trauma Clinical Coordinators, the Trauma Registrars create a unique Trauma Registry number in the DI V5 Registry. The first page of the registry is completed, including where the patient arrived from, date/time of arrival, patient name/medical record number, and Trauma Band number.

The Trauma Registrars complete the data entry, including diagnosis coding to the most specific AIS code, ICD10 procedure coding, and initial documentation of all identified issues into the Outcomes Module. Through this process, any identified data validation issue is corrected through collaboration with other team members. The first closure of the record will include both TQIP and V5 registry validation checks. This will occur no later than 60 days after discharge.

At the close of a discharge month, the Trauma Registrars will complete a series of trauma registry reports, which will be utilized to glean data for abstraction/keying errors.

UAMS participates in an annual state validation performed by QSource, the Arkansas Contract Quality Improvement Organization. This validation provides facility and regional/state-level inter-rater reliability reports. In addition, a minimum of 10% of the program's high-risk (ISS > 15) patient records are re-abstracted to establish levels of inter-rater reliability, both with the Clinical Coordinators and Trauma Registrars. Education is provided for identified trends.

Once registry entry is completed, identified charts with PI will be placed in the Trauma Performance Improvement Coordinator's (TPIC) work-cue for review and completion in the Outcomes Modules.

E. Monitoring Compliance

The PI plan is designed to provide an ongoing, comprehensive, and systematic structure for monitoring the quality and appropriateness of multidisciplinary patient care of the injured patient. This process requires concurrent issue identification, validation, and documentation by the Trauma Clinical Coordinators. The monitoring and evaluation of patient care is based upon the following:

1. **Standards of Quality Care:**
   All trauma patients who meet the criteria for entry into the trauma registry are monitored for deviations in care, occurrences, or adverse events

according to standards of quality trauma care as defined by regional, state, and national standards. UAMS maintains Clinical Practice Management Guidelines (CPMGs) to provide a framework for standardization of practice at UAMS. These are open source via https://surgery.uams.edu/divisions/trauma/guidelines/

2. **Death Review:**
   Trauma patient deaths are reviewed as they relate to trauma care and trauma system issues. This includes a review of hospice discharges.

3. **Audit Filters/Complications:**
   All Audit Filters/Complications as defined by The American College of Surgeons, National Trauma Databank Standards, Arkansas Trauma System Clinical Practice Management Guidelines, and the UAMS Trauma Program custom filters are monitored. All audit filters/complications are reported to the Trauma Peer Review Committee quarterly.

F. **Levels of Review**

1. **Primary Level Review**: The Trauma Clinical Coordinators provide concurrent issue identification, validation, and documentation of all issues during data abstraction. This is accomplished through daily trauma rounds, reviewing the medical record, and other communication with the interdisciplinary team (hallway conversations, submissions to PI email, etc.). Each trauma patient record is screened daily for variations from the standard of care or events. Variations are reported to the primary team for mitigation.

   The issues will be evaluated to determine the level of harm. Examples of categories of events which could be addressed at the primary review level:
   - Issues with minimal impact on the trauma system or patient
   - Documentation issues without adverse patient harm
   - Timeliness of response of surgeons and consultants
   - Prehospital issues without evidence of patient harm
   - Activation level discrepancies
   - Admission to a non-surgical service
   - Missed injuries
   - Outside hospital issues related to the timeliness of transfer
   - Specific PI filters that have exceptions to inclusion are noted in their description
   - Specific clinical complications that are monitored for frequency within the PI plan (e.g., CLABSI, VAP, CAUTI)

   During this level of review, immediate resolution and feedback may occur. Any issues identified that meet the above criteria may be referred to the TMD or his designee for evaluation at the secondary review level if the

Trauma Program Director or Trauma PI Coordinator feels that further evaluation and review is warranted.

2. **Secondary Level Review:** All standard of care variations or provider/system care issues are validated, documented, and prepared for a secondary level of review with the TMD. The TMD may propose action plans refer to specialty liaisons/departmental committees or Peer Review meetings (Department of Surgery M&M, Trauma/EGS Peer Review Committee, Trauma Multidisciplinary Peer Review Committee, Trauma Multi-specialty Peer Review). All issues not closed in the primary review will go for a secondary review. The TPD is responsible for the follow-up activities of this meeting. When the TMD is the physician of record, the case will be referred to the section chief or designee for review. Issues may be closed in Secondary Review or referred for Tertiary Review.

   The Trauma PI Coordinator/Trauma Program Director will prepare the chart by creating a Secondary Review Form and compiling a case file for the review.

3. **Tertiary Level Review:** Tertiary review cases will include all Mortalities and Sentinel Events, Provider Errors, and deviations in standards of care.

   Tertiary Review may occur in one of the following forums:
   a. Trauma Multidisciplinary Peer Review Committee:
      - Meets: Monthly
      - Membership: This committee includes trauma surgeons, Trauma APRNs, and liaisons from neurosurgery, orthopedic surgery, emergency medicine, radiology, clinical pathology (blood bank), anesthesiology, critical care, geriatrics, and EMS.
      - Scope: Performance review in care of the multi-system trauma patient; Present and analyze data to reduce practice variation; obtain fidelity regarding the root cause of variation.

   b. Trauma/EGS Peer Review Committee:
      - Meets: Weekly
      - Membership: This committee includes trauma surgeons, APRNs, clinical nurses, and nurses from the Trauma Program Office.
      - Scope:
   c. Department of Surgery M&M
      - Meets: Weekly
      - Membership: All surgical staff, residents, students, and mid-level providers
   d. Multi-specialty M&M:

- Meets: Quarterly
- Membership: This committee includes representatives from specialties involved in the presented cases.

e. Surgical sub-specialty departmental M&M
   - Meets: Monthly
   - Membership: These committees include faculty from specialty departments

f. Trauma/Emergency Medicine Conference
   - Meets: Monthly
   - Membership: This committee includes Trauma Surgeons, Emergency Medicine Physicians, APRNs, Clinical Nurses, residents, and students.

All unanticipated Mortalities will be presented at Trauma Multidisciplinary Peer Review.

These conferences are considered peer review protected and are part of the performance review process of the trauma program. A summary of the discussion of individual cases presented in these forums will be included in the PI chart for the individual case.

4. **Quaternary Level of Review:** This level of review can occur based on a referral from the Trauma Program. Medical review by the UAMS Adverse Events Committee or an external peer review is considered a quaternary level of review. These groups can include:
   - Medical Executive Committee
   - External Review
   - Central Arkansas Trauma Regional Advisory Council (CATRAC) PI Committee
   - State Trauma Advisory Council PI Committee

See Appendix A for PI levels of review and reporting time frames.

G. Decision-Making Process/Determination of Judgments

An essential goal of the trauma PI committees is to determine whether a breakdown in the care system was preventable. This step is a necessary prerequisite to developing an effective action plan. Each PI Committee uses an objective process to determine preventability when confronted with an issue. Determination is made by group consensus.

Classification system

a. Mortality

i. Unanticipated Mortality with Opportunity for Improvement (UM):

Anatomic injury or combination of injuries considered survivable. Includes standard protocols not followed with unfavorable consequences or inappropriate provider care with unfavorable consequences

ii. Unanticipated Mortality with Undetermined Opportunity for Improvement (UDM): Anatomic injury or a combination of injuries considered survivable. Standard protocols were followed, and the provision of care was deemed appropriate

iii. Anticipated Mortality with Opportunity for Improvement (AM): Anatomic injury or combination of injuries considered severe but survivable under optimal conditions. Standard protocols are not followed, possibly resulting in unfavorable consequences or provider-related care is considered sub-optimal, possibly resulting in unfavorable consequences.

iv. Mortality without Opportunity for Improvement (M): Anatomic injury or combination of injuries considered non-survivable with optimal care. Standard protocols followed or, if not followed, did not result in unfavorable consequences or provider-related care appropriate or, if sub-optimal, did not result in unfavorable consequences.

b. Morbidity:
   i. Inappropriate care with OFI:
   Can Include:
   - Complications related to deviation from standard protocol
   - Complications resulting from provider error
   - Complications related to error in judgment
   - Complications related to equipment malfunction

   ii. Appropriate care with OFI:
   Can Include:
   - Complications indirectly related to deviation from standard protocol
   - Operator error or error in judgment
   - Provider-related care is considered suboptimal, indirectly resulting in an unfavorable outcome

   iii. Appropriate care without OFI
   Can Include:
   - Complications occurred despite adherence to a reasonable standard protocol
   - Complications occurred despite appropriate care and good judgment

H. Corrective Action and Loop Closure Plan

The TMD and Trauma Service Director oversee all corrective action planning and loop closure.

Loop closure is determining that a specific PI issue has been successfully addressed. Recommendations for reevaluation and loop closure may be defined in the review forum. Ideally, this results from evaluating the issue, targeted intervention, and reevaluation to ensure the intervention has successfully prevented additional occurrences of the original issue. Options for successful loop closure, based on the action plan, include:

- No Further Action Required - the concern was determined not to be significant or warrant further action
- Trend – the concern is included in an existing PI filter or will be added to a list of monitored events to determine frequency and recurrence with a specific timeline for reevaluation to include Trending Providers/Issues/Monitor via Quarterly Reports
- Targeted education – a specific educational intervention will be made with the individual or the service to reduce the likelihood of the same error occurring again. This may be done at any of the routine conferences, journal club, individually with the provider, or as a result of the discussion in a tertiary review
- Policy/Guideline Development/Revision – the specific issue requires a new policy or a further clarification or amendment to an existing policy to resolve the described issue
- Focused Audit of Identified Trend – In circumstances where a series or pattern of similar issues are identified, the individual case can be referred to as a focused audit with a group of similar cases. The purpose is to evaluate trends or patterns and develop an appropriate PI plan for the group of issues. This will result in a separate PI file for the group of cases and the PI solution
- Focused Corrective Action Plan – The issue reviewed has identified a resource, communication, or facility issue that requires a workgroup to determine an appropriate intervention. The workgroup assigned by the TMD will evaluate the specific issue and make a formal report in the form of a Focused Corrective Action and Implementation Plan to institute the appropriate changes and track their implementation.
- Individual Counseling – an individual conference between the TMD or specialty liaison and a provider to address the specific care, behavioral, or other issues identified. A discussion summary will be included in the provider file, and the issue will be tracked through the provider file.
- Peer Review Presentation – any issue that warrants further input from the providers involved, has a substantial system issue, or has illustrative value to other providers may be sent to either General Surgery, specialty-specific, or Trauma Program Peer Review.
- Internal Referral or Call Panel Change – a pattern of provider-specific events has been identified and warrants formal investigation or further action within the credentialing process. This may necessitate a change in the provider's participation in the call panel.
- Outside Referral – the issue involves other facilities and necessitates feedback to that facility or a request for additional information. A letter will be sent to

the facility.

- TRAC Referral – The identified issue involves multiple facilities or services within the TRAC, which would be best adjudicated at the TRAC level. A formal report to the Central Arkansas Trauma Regional Advisory Council Performance Improvement Committee will be made.
- ADH Referral - The issue involves multiple TRACS or is relevant to all facilities in the state, and a referral will be made to the ADH Trauma Advisory Council Performance Improvement Committee.

A PI issue will not be considered closed until the reevaluation process demonstrates a performance measure or change at an acceptable level. "Acceptable level" may be determined by benchmarking, evidence-based data analysis, or decision by the Trauma Peer Review Committee.

Final Loop Closure can occur at any level. The Trauma Medical Director, Trauma Program Director, or Trauma Performance Improvement Coordinator can approve loop closure. Individual cases may be closed, and further action may be determined after quarterly review and presentation to the Multidisciplinary Peer Review Committee.

I. Reporting and Integration into the Hospital Performance Improvement Process.

The statistical performance, trauma performance, and patient safety outcomes are reported bi-monthly through the Trauma Operational and monthly Multidisciplinary Peer Review Committees.

Unresolved issues that require an in-depth root cause analysis may be referred to the Adverse Events Committee. Trauma faculty members are represented on this committee.

UAMS submits quarterly data to the American College of Surgeons (ACS) NTDB. This report is utilized to compare outcomes and benchmark opportunities. Variances where the UAMS performance is below the national outcomes, are targets for trauma and hospital performance improvement projects. Semi-annually, UAMS receives a risk-adjusted TQIP report that is shared with the UAMS QUEST Committee and Hospital Medical Board

The UAMS Trauma Multidisciplinary Peer Review Committee is a sub-committee. This is a committee of the UAMS Medical Board established to assist the Hospital Medical Board in overseeing the provision of safe and high-quality patient experiences throughout the organization.

J. Confidentiality Protection

All performance improvement activities and related documents will be considered confidential and protected.

The Trauma Program office maintains All documents supporting the Trauma Performance Improvement and Patient Safety Plan. The documents are filed and secured with limited, controlled access.
All performance improvement information will be labeled “Confidential quality improvement document. Unauthorized disclosure is prohibited pursuant to Arkansas Code Annotated 16-46-105.”
All PI documents will be collected at the close of each peer review meeting.