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A. Philosophy of the Trauma Program

1. Geisiger Health System is an integrated health services organization widely recognized for its innovative use of the electronic health record and the development of innovative care delivery models such as Proven Health Navigator and ProvenCare®, Acute/Chronic Programs. As one of the nation’s largest health service organizations, Geisinger serves more than three million residents throughout 45 counties in central, south-central, and northeast Pennsylvania, and also in New Jersey with the addition of AtlantiCare, a National Malcolm Balridge Award recipient. The physician-led system is comprised of approximately 30,000 employees, including nearly 16,000 physicians, 12 hospital campuses, two research centers, and a 510,000-member health plan, all of which leverage an estimated $8.9 billion positive impact on the Pennsylvania economy. Geisinger has repeatedly garnered national accolades for integration, quality, and service. In addition to fulfilling its patient care mission, Geisinger has a long-standing commitment to medical education, research, and community service.

2. Geisiger Health System has had a long tradition in the provision of trauma care and has been recognized as a regional resource trauma center since 1986. Geisinger Health System and the Janet Weis Children’s Hospital are committed to the provision of adult and pediatric trauma care which fostered them to gain accreditation as a Level One Trauma Center with Additional Qualifications in Pediatric Trauma in 1996. The Janet Weis Children’s Hospital has been accredited as a Level Two Trauma Center since 2011. To accomplish these goals, Geisinger requires strong leadership with authority to coordinate the multidisciplinary team. The need to coordinate prevention programs and to direct research activities among many different specialties providing care to the trauma patient will impact the future direction of adult and pediatric trauma care in the country.

3. Geisiger Health System has and continues to be successful in its attention to traumatized patients by providing coordinated care throughout Geisinger departments and divisions. Geisinger Health System complies with the Pennsylvania Trauma Systems Foundation (PTSF) standards for Trauma Center Accreditation and is designated as a Level I Regional Resource Trauma Center by the Pennsylvania Trauma Systems Foundation. In 2012, Geisinger Health System became part of the American College of Surgeons Trauma Quality Improvement Program (ACS TQIP). By utilizing ACS TQIP, Geisinger Health System is elevating the quality of care currently being delivered by members of the multidisciplinary team through the use of risk adjusted benchmarking based upon national comparisons. ACS TQIP also provides education and training to help Geisinger Health System trauma program to improve the quality of data and accurately interpret our benchmark reports.

4. The Division of Trauma Surgery falls under the Division of General Surgery. The expansion of our services includes not only adult and pediatric trauma, but emergency general surgery and surgical critical care. This service will permit enhanced patient services and facilitate a robust learning environment for residents and medical students.
B. Mission and Vision of the Trauma Performance Improvement (PI) Program

1. Geisinger Health System is committed to quality patient care, performance improvement and patient safety, outreach and prevention programs, Emergency Medical services (EMS/Pre-hospital), continuing education, and research activities. This demonstrates the organization's dedication to furthering the field of multisystem injury treatment. Geisinger Health System has maintained accreditation as a Level I Regional Resource Trauma Center since its inception in 1986.

2. The trauma service will have a formal, validated, internal performance improvement process that allows for a multidisciplinary approach to rapid problem identification, data driven analysis, and resolution of issues within the quality framework of our institution.

3. Our mission is to deliver high quality patient 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.

C. Authority and Scope

1. In July 1981, the Board of Directors of Geisinger Health System approved and endorsed the “Center” status for trauma treatment and prevention efforts and for the Trauma Program Medical Director to report directly to the President and Chief Executive Office of Geisinger Health System. This resolution is reaffirmed by the Medical Staff and Hospital Board every three years.

2. The Trauma Program Medical Director for the Trauma Center has the authority to affect and direct all aspects of trauma care delivery, including the following:

   a. Provide leadership and oversight for the Performance Improvement (PI) process. Grant trauma call privileges to trauma surgical team members. In collaboration with the designated subspecialty liaison appointed by the respective Department Chairman, withdraw privileges of those trauma team members who do not meet the requirements established by the Trauma Program to provide care to trauma patients.

   b. Manage and direct the quality management multidisciplinary peer review process.

   c. Provide direction and approval for establishing the Trauma Protocols, Policies,
and Clinical Management Practice Guidelines.

d. Facilitate and direct the multidisciplinary team to ensure that the provision of patient care encompasses the entire health care continuum.

e. The Trauma Program Medical Director collaboratively works with the subspecialty department chairmen to appoint subspecialty liaisons. Each physician subspecialty liaison works collaboratively with the Trauma Program Medical Director to ensure the subspecialty physicians are appropriately credentialed to provide care to trauma patients. The subspecialty liaison also participates in the Trauma Program’s Performance Improvement process, which includes concurrent and/or retrospective identification and resolution of issues and retrospective review. The Trauma PI process is integrated into the hospital Performance Improvement program formally by the Trauma Program Medical Director who formally reports to the Hospital Performance and Improvement Committee. Updates to the committee are provided annually at a minimum. Informally, the trauma PI program interfaces with hospital PI initiatives through membership and participation in a variety of committees.

f. The Trauma Program Medical Director is also obligated to report annually to the Hospital Executive Committee. During this meeting, the Trauma Program Medical Director presents data from the Trauma Registry, outlining trauma program performance and its impact upon the health care system in order to improve patient outcomes and enhance trauma care throughout the state.

D. Credentialing

1. Trauma call will be limited to those with demonstrated skills, commitment, and experience. Surgical privileges do not necessarily qualify a surgeon to care for or consult on the care of the severely injured. The Trauma Program Medical Director, in conjunction with the hospital’s medical governing board or body, and in association with the liaison/representative from neurosurgery, orthopedic surgery, emergency medicine, radiology, anesthesia, and rehabilitation will utilize the trauma performance improvement program to determine each individual attending physician’s ability to participate on the trauma team. This will be based on a review of each individual attending physician performance in the trauma program. At a minimum, this will occur at least once per site survey cycle.

2. Reappointment to the trauma admitting/consulting staff must be coordinated by the Trauma Program Medical Director in association with the liaison/representative from neurosurgery, orthopedic surgery, emergency medicine, radiology, anesthesia, and rehabilitation and other appropriate disciplines who will work with the Trauma Program Medical Director and based on the following criteria:
a. Maintenance of good standing in the primary specialty.

b. Evidence of the required continuing medical education in trauma as well as compliance with divisional protocols and/or guidelines.

c. Documentation of attendance at multidisciplinary conferences, morbidity/mortality rounds, and/or institution peer-review conferences that deal with the care of injured patients.

d. Satisfactory performance in managing trauma patients based on performance assessment and outcome analysis.

3. All certifications must be maintained on a continuous basis.

4. All members of the General Surgical Trauma Call Roster must maintain at least provider Advanced Trauma Life Support (ATLS) certification.

5. 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.

E. Trauma Patient Population Criteria

1. ALL patients admitted for treatment of a diagnosis of trauma (ICD 10 CM injury codes S00-S 99, T 07-T 79/ICD 9-CM injury codes 800-995, excluding ICD-10-CM T 15-T 19.9/930-939.9) and those who meet any of the following criteria:

   a. All Intensive Care Unit (ICU) admissions (2:1 ratio) - Excluding ICU used as a PACU
   b. All step-down unit admissions (4:1 ratio)
   c. All Dead on Arrivals (DOA), pronounced dead after arrival
   d. All Trauma Deaths
   e. All trauma patients remaining at your facility over 48 hours, beginning from the
   f. All trauma patients remaining at your facility between 36 and 48 hours, beginning
      from the time of arrival to the Emergency Department, with an Injury Severity
      Score (ISS) of nine or greater. Trauma patients are defined as patients remaining
      at your facility for the treatment or diagnosis of trauma.
   g. All admitted transfers in
   h. All transfers out
   i. Cases meeting any of the above criteria, but have no documented injuries
   j. Optional: Elective admissions (patients not admitted through the Emergency
      Department not transferred from another facility) with an injury date > 72 hours prior
      to admission and an Injury Severity Score > 13 may be submitted to PTOS. Elective
      admissions with injury > 72 hours prior to admission and ISS < 13 need not be
      submitted.
k. Excluded: Patients who only suffer a solitary hip fracture, (ICD-10-CM codes V00.11A, V00.131A, V00.141A, V00.151A, V00.312A, V00.321A, V00.388A, W01.110A, W01.198A, W03.XXXA, W18.30XA, W18.49XA, W19.XXXA/ ICD-9-CM Ecodes E885.0-E888.9). The intent is to exclude solitary hip fractures that are pathological or osteopenic in nature, peri-prosthetic fractures with a traumatic mechanism should be coded to the traumatic fracture area.
   1) Asphyxiation with no other injuries
   2) Drownings
   3) Poisonings (Chemical Ingestion, including internal organ burns from chemical ingestion, classifiable to the ICD-10 for Corrosion- T 28.5-T 28.90, T 28.99/ICD-9 CM code 947)
   4) Admitted patients injured while in a trauma center, i.e. a patient who fell out of bed.
   5) Patients only having a hypothermia or hyperthermia diagnosis with no other injuries.
   6) Diagnosis codes T15-T19.9 (ICD-10-CM)/ 930-939.9 (ICD-9) (Effects of foreign body entering through orifice) should be excluded.

2. Patients admitted for less than 48 hours are entered into the trauma registry for quality purposes but are not submitted for PTOS (Pennsylvania Trauma Outcomes Study) reports.

F. Data Collection and Analysis

1. Trauma Registry Data Collection:
   a. The trauma registry is provided with Emergency Department and hospital admission reports generated daily at 02:30 specific to the previous calendar day. The reports are reviewed Monday through Friday for mechanism of injury, admitting service, and primary diagnosis. Reports generated on Saturday, Sunday, and hospital observed holidays are reviewed on the next business day. Designated trauma patients are assigned a unique identification number (Collector trauma number) for accession into the registry. Newly created registry records are concurrently amended with demographic and diagnostic data from the hospital’s online mainframe information system.

   b. Daily Report and Clinical Rounds is the key forum for identifying new clinical patient information. It is the responsibility of the registrar in attendance Monday through Friday to record and enter the newly reported or updated information into the Collector database. The following types of information are collected and updated on a daily basis as they become known:

      1) Pre-existing conditions
      2) Pre-hospital interventions
      3) Clinical data, i.e., airway status, abnormal vital signs, blood alcohol content
      4) Diagnoses
      5) Key procedures performed within the
          a) Emergency department
b. Operating room
c. ICU
d. Special procedure unit
6. PTOS occurrences with date of identification and location
7. Discharge dates and disposition

c. In instances when the trauma team is activated, a trauma data collection sheet is used by Life Flight dispatch to record specific information regarding the patient, including:

1. Demographics: name, age, gender, mechanism, date
2. Mode of arrival: air or ground
3. Trauma team activation: page date, time and level
4. Origin: Scene or Inter-hospital
5. Referring Hospital
6. Referring Physician
7. Referring EMS Agency
8. Receiving Physician
9. Transferring Physician on interfacility transfers

d. The data collection sheets are received via fax from Life Flight dispatch on a daily basis for further concurrent abstraction and filed within the trauma registry.

e. Additional diagnostic, procedural, and disposition data is entered concurrently. The registry has access to online dictations and diagnostic findings which may also be included. Finally, the registry receives copies of discharge summaries for concurrent updates of disposition and outcomes.

f. Retrospectively, the closed medical record is requested within six weeks of discharge for final abstracting and submission to the Pennsylvania Trauma Outcomes Study as appropriate.

g. The trauma registry and trauma PI department work collaboratively in regards to case finding, occurrence and UDI (user defined issue) identification, and mortality review. The trauma registry abstracts all death charts concurrently and the data is used to aid the discussion during weekly and monthly Morbidity and Mortality Conferences. Furthermore, the information gathered by the trauma registry in the process noted above eliminates redundant data gathering, saving time and enhancing Morbidity and Mortality discussions by using custom COLLECTOR reports.

2. Trauma Registry Analysis
a. The trauma registry staff works collaboratively with the Trauma Program Medical Director (TPMD), Trauma Program Coordinator, and Trauma Program Integration Specialist to provide accurate data, statistical information, and technical support to the performance improvement processes. As the repository for hospital-wide trauma patient data, the trauma registry database, Collector, is interfaced with the trauma performance improvement database, Patient Outcomes Performance Improvement Management
System (POPIMS), through a daily unidirectional transfer of data. The interface eliminates duplication of work between PI and registry initiatives and concurrent maintenance of registry data facilitates an aggressive PI evaluation through loop closure process. To ensure that concurrent data is reflected in the registry, a member of the registry staff attends daily report and clinical rounds to obtain information for immediate update to the registry database.

b. Geisinger Health System also participates in risk-adjusted benchmarking. Data from the Trauma Registry will be validated and submitted to the Trauma Quality Improvement Program (TQIP)/National Trauma Data Bank (NTDB) on a quarterly basis. Reports from TQIP will be analyzed by the Trauma Program Medical Director, Trauma Program Coordinator, and the Trauma Program Integration Specialist. The program leadership will then report to hospital leadership and the PIPS committee on a quarterly basis. Based upon this data, action plans will be developed and implemented to correct identified issues or opportunities for improvement. Both the NTDB and TQIP require on-going education and reporting. Reports from both programs support the performance and improvement program at Geisinger Health System. The Trauma Registry staff work with the surgical residency and all attending providers for abstraction of data to support research and publication initiatives. The registry staff attend Trauma Program meetings interfacing with multidisciplinary departments and ad hoc meetings as requested. Data to support outreach prevention programs provides direction in the on-going community and injury prevention initiatives.

c. The Trauma Program Data Coordinator is an added position to support data abstraction through the Trauma Registry and research initiatives. Other responsibilities include data submission in POPIMS, Collector, TQIP, and the Trauma Educational Database providing program monitoring and compliance with trauma standards.

d. The Trauma Registrar and the Trauma Program Integration Specialist work collaboratively to ensure the appropriate recording, reporting, and trending of PTOS occurrences in Collector and for institution identified variances and audit filters in POPIMS. Collaboration on query and report writing activities, developing standards for depicting trended data, and optimizing the use of Collector and POPIMS data elements is a priority between these two components of the PI process.

e. Because of the one-way design of adding data from Collector to POPIMS, a communication tool was developed so that deleted records and PTOS occurrences could be flagged by the registrars for manual update to POPIMS. A virtual computer workspace was initiated in which spreadsheets could be shared and updated between
the registry staff and the Trauma Program Integration Specialist to facilitate routine communication of revisions to the registry and POPIMS records. The spreadsheets may be updated concurrently (while the patient is in-house) or retrospectively, regardless if the information changes in a day, month, or even 6-months post discharge, as is the case with autopsy reports.

f. The registry acts as a final retrospective check of clinical variances found in the medical record and Collector abstract. When clinical questions arise, registrars do not hesitate to seek answers from the Trauma Program Medical Director, Trauma Program Coordinator, Trauma Program Integration Specialist and/or trauma attending staff. An example would include:

1) Patient who sustained a finger fracture that did not have a documented consult to orthopedics during the inpatient stay. The concern was relayed by the registrar to the Trauma Program Integrations Specialist who found that an outpatient follow-up appointment had been made at the time of discharge to address the injury.

g. Finally, the PI reporting capacity of the Collector and POPIMS software is maximized by the joint efforts of the Trauma Registry and Trauma Program Integration Specialist. Examples of reports that were developed in-house and are routinely utilized include:

1) Mortality and morbidity case summary reports distributed to physician reviewers, and included in the Trauma Team Morbidity and Mortality meeting agendas (monthly).
2) Trended data reported to the Trauma Program Medical Director and Trauma Program Coordinator and distributed to the respective trauma program liaisons. Some examples include:

   a) PCR retrieval rate (quarterly)
   b) Emergency Department Nursing flow sheet documentation (bi-weekly & monthly)
   c) Physician resuscitation response documentation (monthly)
   d) Subspecialist response documentation (monthly)
   e) Provider (admitting physician) specific outcomes, demographics and process statistics (annually)
   f) Additional reports as requested

h. Sorted patient lists are generated for retrospective chart reviews and focused studies. The database is queried for specific questions or filters and the lists are sorted in terminal digit order for optimal chart retrieval by medical records staff.

i. The trauma registry is well integrated and a key resource to the trauma PI program. The registry staff strive to demonstrate their commitment to the program through
their attention to detail in completing case abstracts according to written guidelines, calling attention to variances, and self-correction through data analysis.

3. Performance Improvement

A. Concurrent Review Issue Identification:
   1). The Trauma PI process includes concurrent review primarily through problem/issue identification during daily trauma report, clinical rounds, daily risk management reports, and self-reporting by trauma team members. The Trauma Program Operations Committee Meeting consists of the following members:

   ❖ Trauma Surgeons
   ❖ Neurosurgeons
   ❖ Orthopaedic Surgeons
   ❖ Emergency Medicine
   ❖ Anesthesia
   ❖ Radiology
   ❖ Psychiatrist
   ❖ Hospitalist
   ❖ Medical subspecialties
   ❖ Residents
   ❖ Trauma Program Director; Adult and Pediatric
   ❖ Trauma Program Integration Specialist
   ❖ Physician Assistants (Trauma/Neurosurgery/Orthopedic)
   ❖ Security Department
   ❖ Trauma Registrars
   ❖ Trauma Social Worker
   ❖ Physical Therapists
   ❖ Occupational Therapists
   ❖ Speech Therapists
   ❖ Hospice & Palliative Care
   ❖ Spiritual Care
   ❖ Staff Nurses (i.e. Critical Care, Operating Room, Wards, etc.)
   ❖ Ancillary Departments
   ❖ Trauma Data Coordinator
   ❖ Trauma Program Coordinator, Adult and Pediatric
   ❖ Adult and Pediatric Case Managers
   ❖ Geisinger Life Flight
   ❖ EMS/Pre-hospital
   ❖ Critical Care/ICU
   ❖ Quality Management
   ❖ Special Care Unit/HFAM
   ❖ Respiratory Therapy
   ❖ Laboratory Services/Blood Bank
2). Any member of the multidisciplinary team may identify patient, provider, or system issues as they occur. The primary data collectors for this process are the Trauma Integration Specialist, Trauma Program Director, Trauma Program Coordinator, Trauma Attending’s, Trauma Case Managers, PAs, etc. In this respect the Trauma Program Case Managers also collect concurrent PI issues through daily chart reviews and any issues found are then placed into the Trauma Monthly Concurrent PI excel spreadsheet for further review by the Trauma Integration Specialist. Issues can also be sent anonymously via secure intranet site. The Trauma Integration Specialist in collaboration with the Trauma Case Managers as well as the members of the Trauma Program Operations Committee, ensures concurrent review of issues, analysis, action planning, and performance improvement loop closure. Patient Outcomes Performance Improvement Management System (POPIMS) is the electronic PI data repository utilized by the trauma program.

3). The Trauma Program Integration Specialist works in close coordination with the hospital’s Division of Quality and Patient Safety: Regulatory Performance Improvement. In order to prevent redundant reporting, trauma takes advantage of the hospital’s Patient Safety Hotline (570-214-4000). Trauma specific issues are then referred to the Trauma Program Integration Specialist. Issues are also identified through the hospital’s Risk Management/Patient Safety Department via the online MIDAS incident reporting system (Policy 06.01: Improving Organizational Performance/Identification of Events and Patient Safety Reporting). Trauma specific issues are monitored by the Trauma Program Integration Specialist with follow up and subsequent loop closure’s entered in POPIMS. The Quality and Patient Safety Department can assign tasks for loop closure based on the occurrence reports entered by staff members.

4). The Trauma Program Coordinator and the Trauma Program Medical Director are frequently present at resuscitations to facilitate immediate concurrent identification, and provide education when appropriate during the resuscitative phase of care.

5). Retrospective issues are identified via self-reporting, any forum in which the chart is reviewed after discharge, and the trauma registry during final chart abstraction.

6). Preventability status is assigned to identify occurrences using the criteria noted in section IX.
G. Process for Monitoring Compliance

1. Standards of Quality Care: All trauma patients that meet criteria for entry into the trauma registry are monitored for deviation in care, occurrences, or adverse events according to the standards of quality trauma care as established by the Trauma Service and local, regional, and national standards.

2. Death reviews: Trauma patient deaths and trauma patients transferred to virtual hospice are reviewed as they relate to trauma care and trauma system issues.

3. Audit Filters Indicators: Audit Filters / indicators as defined by the American College Surgeons and/or the trauma program and/or the trauma system are monitored and reported on a quarterly basis at the Trauma Liaison Meeting.

4. Occurrences: Complications or occurrences, as they are defined by the PA Trauma Systems Foundation (PTSF), which occur in the trauma patient, are recorded in the hospital Trauma Registry. The Trauma PI Committee will review occurrences for injury or treatment that significantly affected patient outcome. The Trauma PI Committee makes appropriate referrals and recommendations. Occurrences will be reported on a quarterly basis at the Trauma Liaison Meeting and will be monitored for trend analysis.

5. Opportunities for Improvement (OFI): Deviations in care as defined by the POPIMS ad Hoc Committee. This is a list of common complications that occur throughout most trauma centers such as delays in care, treatment, diagnosis, etc. There are a total of 84 different deviations in care that are categorized as opportunities to improve patient care.

6. User Defined Issues (UDI): Defined by the institution as being a deviation in care or another quality parameter (such as tracking new protocol) to assist in identifying ongoing care related issues. These identified issues are not represented in the list of OFI’s.

7. Systems issues: All identified issues that are not provider related are reviewed in the Trauma Performance Improvement Committee.

H. Levels of Review

The process of care will be monitored continuously by utilizing audit filters and occurrences as defined by the PA Trauma Systems Foundation and the American College of Surgeons Committee on Trauma. User Defined Issues will be presented as they are selected by the Trauma PI committee. Those cases or system issues identified will be reviewed by the Trauma PI Coordinator and Trauma PI Medical Director for determination of further action.
1. **Level I Review:**

   a). This level of review consists of daily concurrent and retrospective issue identification and validation. The activities of primary review include concurrent review by the Trauma Program Operations Manager, Trauma Program Coordinator, Trauma Program Integration Specialist, Trauma Registrar, Trauma Case Managers and various members of the Trauma Team through daily:
   1). Trauma Morning Report
   2). Multidisciplinary clinical rounds
   3). Daily Risk Management Reports
   4). Trauma Registry data findings and/or reports
   5). Trauma Monthly Concurrent PI collected by the Trauma Case Managers
   6). Retrospective data review

   b). During this level of review immediate resolution and feedback may occur. All phases of care are monitored and issues are identified and addressed either through individual counseling or the development of a guideline or action plan.

2. **Level II Review:**

   a). A case in which a Level II Review is required occurs when issues in clinical care, and or provider or systems issues are evident that require the Trauma Program Medical Director's expertise and judgment. During a Level II Review, the Trauma Program Operations Manager, Trauma Program Coordinator and Trauma Program Integration Specialist will also be actively involved in addressing, monitoring, and implementing corrective actions to address any and/or all identified issues/events. They may begin further investigation, implement action without formal referral to a peer review or system committee, or decide to send it to the appropriate PI committee or to a hospital department for further investigation and/or peer review and ask for follow up. Typically, these issues are reviewed at bi-weekly Trauma Mortality and Morbidity Conferences. Discussion includes education and determination of preventability status. Documentation of issues and discussion are entered into POPIMS. The issue may be closed at this point or referred to the Trauma Team bimonthly Morbidity and Mortality Conference. Educational issues identified may be addressed individually, through a corrective action plan, or referred to a Trauma/Acute Care Service Conference or Trauma/Acute Care Service Journal Club for review.

3. **Level III Review:**

   a). The purpose of the Level III Review is to identify those issues most significant to trauma patient care systems and patient care. The Trauma Program Medical Director, Trauma Program Operations Manager, Trauma Program Coordinator, and Trauma Program Integration Specialist will perform an initial case review in preparation for the Trauma Program Operations Committee Meeting, identifying all background information, pertinent protocols/guidelines (or lack of), and specifying all individual issues to be discussed. The issue is then formally reviewed by the
Trauma Program Operations Committee, Trauma Morbidity and Mortality Conference or the Trauma, Trauma Section Meeting and the Physician Team Meeting. The goal is to evaluate the care of a trauma patient from a clinical and systems perspective and to perform interdisciplinary implementation of improvement strategies. Review will occur at the following forums:

1). Monthly Morbidity and Mortality Review:
   - Major issues requiring further discussion, multidisciplinary review, or autopsy analysis are conducted at the monthly multidisciplinary Trauma Morbidity and Mortality Conference. Action items at this meeting may include recommendations for education, referral to the appropriate sub-specialty liaison for review with an individual provider, or creation of an ad hoc committee to review/revise a policy, procedure, or protocol.
   - Major issues of a system nature are reviewed at the multidisciplinary Trauma Liaison meeting. Policies, procedures, or protocols currently under review or revisions are presented during this forum.
   - Membership includes all trauma surgeons, the Trauma Program Coordinator, Trauma Program Integration Specialist, and representatives from Orthopedic Surgery, Anesthesia, Emergency Medicine, and Neurosurgery Departments. Additional attendees are invited ad hoc.

2). Monthly Trauma Physician Team Meeting:
   - Issues are identified concurrently and/or retrospectively by the individual committees or groups that report to the Trauma Physician Team Meeting. Identification and discussion of system issues.

3). Trauma Program Operations Committee Meeting:
   - The Trauma Operational Committee has been changed established, coordinate, and maintain an effective hospital-wide Quality Improvement Plan. Trauma related issues are taken to this committee for further analysis or to approve a plan for issue resolution.
   - The committee serves as a forum for the discussion, analysis, and oversight of hospital policy and procedure concerning quality improvement activities and/or initiatives.

4). System wide Trauma Morbidity and Mortality Review:
   - Major issues requiring further discussion, multidisciplinary review, or
autopsy analysis are conducted at the monthly multidisciplinary Trauma Morbidity and Mortality Conference. Action items at this meeting may include recommendations for education, referral to the appropriate sub-specialty liaison for review with an individual provider, or creation of an ad hoc committee to review/revise a policy, procedure, or protocol.

- Major issues of a system nature are reviewed at the multidisciplinary Trauma Liaison meeting. Policies, procedures, or protocols currently under review or revisions are presented during this forum.

- Membership includes all trauma surgeons, the Trauma Program Coordinator, Trauma Program Integration Specialist, and representatives from Orthopedic Surgery, Anesthesia, Emergency Medicine and Neurosurgery Departments. Additional attendees are invited ad hoc.

5). **Trauma Department Section Meeting:**

- Issues are identified concurrently and/or retrospectively by the Trauma Team. This meeting format is designed to assist the Trauma Team members in identifying any and/or all patient issues utilizing a multi-team approach to ensure that all of the patients’ needs have been addressed and any/and or all issues have been identified and addressed.

4. **Level IX Review:**

a). **Medical Executive Committee:**

1). Major issues that are not able to be resolved at the Monthly Liaison or M&M review may be referred to The Medical Executive committee for review, recommendation, and final resolution. This may also be in the form of a Root Cause Analysis. Issues which have been reviewed but not resolved by the tertiary review committee may be escalated for review by the appropriate hospital Quality committee.

b). **Outside Peer Review:**

1). To assist with the review and resolution of those issues most significant to the trauma patient care systems and patient care. Findings, determinations, and recommendations are sent back to the Trauma Program Medical Director for final review and closure. The report received from the outside reviewing physician will be shared with the Trauma Program physicians as well as other pertinent team members in order to improve patient care and outcomes throughout the Geisinger Health Care System.
5. Corrective Actions:
When an opportunity for improvement is identified, appropriate corrective actions to mitigate or prevent similar future adverse events must be developed, implemented, and clearly documented by the trauma performance improvement program. Opportunities for improvement are often system related and interdisciplinary. The delineation of corrective actions may be complex and affect multiple departments and services institutions-wide. Adequate review may require using the hospital quality committee to perform a root cause analysis of the event, departmental and/or institutional medical peer review processes, or external review. In all instances, the conclusion and results of these reviews should be documented and available to the Trauma Medical Director and program manager.

I. Determination of Judgments

The committee will render a judgment regarding the appropriateness of the issue on every mortality being reviewed. Each issue will be assessed a preventability status, standard of practice score, note opportunities for improvement, and a coordinated plan.

1. Classification Status:
   a). Mortality:

   1). Unanticipated Mortality with Opportunity for Improvement:

   • Anatomic injury or combination of injuries considered survivable
   • Standard protocols not followed with unfavorable consequence
   • Inappropriate provider care with unfavorable consequences

   2). Anticipated Mortality with Opportunity for Improvement:

   • Anatomic injury or combination of injuries considered severe but survivable under optimal conditions
   • Standard protocols not followed, possibly resulting in unfavorable consequence
   • Provider related care considered sub-optimal, possibly resulting in unfavorable consequences

   3). Mortality without Opportunity for Improvement:

   • Anatomic injury or combination of injuries considered non-survivable with optimal care
   • Standard protocols followed or if not followed, did not result in unfavorable consequence
   • Provider related care appropriate or if sub-optimal, did not result in unfavorable consequences
4). Patients who have withdrawal of support or transfer to hospice will be included in the analysis of preventability. In such cases the care of the patient up until the time that support was withdrawn/transfer should be evaluated as to whether or not standard protocols were followed and whether provision of care was appropriate. These factors along with the analysis of injury and TRISS methodology will then be used to assign preventability.

b). Morbidity:

1). **Unanticipated Event with Opportunity for Improvement**

- Complication related to deviation from standard protocol
- Complication result of provider error
- Complication related to error in judgment
- Complication related to equipment malfunction

2). **Anticipated Event with Opportunity for Improvement**

- Complication indirectly related to deviation from standard protocol, operator error or error in judgment
- Provider related care considered suboptimal indirectly resulting in unfavorable outcome

3). **Event without Opportunity for Improvement**

- Complication occurred despite adherence to a reasonable standard protocol
- Complication occurred despite appropriate care and good judgment

c. **Standard of Practice:**

1). **Acceptable**

2). **Acceptable with reservations**: A variance from trauma center patient management guideline or standard of care that does not negatively impact patient care or outcome.

3). **Unacceptable**: A variance from trauma center patient management guideline or standard of care that negatively impacts patient care or outcome.

d. **Opportunities for Improvement (OFI):**

1). Based on the discussion and review of the case, any aspect of care that can be improved upon in consideration of effectiveness, efficiency, and quality of care.
e. **Plan:**

1. No further action
2. Reviewed with provider
3. Track and trend
4. Education
5. Policy creation or revision
6. Provider counseling
7. Refer to Trauma Monthly Multidisciplinary M&M peer review committee
8. Request further discussion at Trauma Liaison Committee
9. Incorporate OFI into Resident Orientation

**J. Documentation of Analysis and Evaluation**

1. As the repository for hospital-wide trauma patient data, the trauma registry database, Collector, is interfaced with the trauma performance improvement database, POPIMS, through a daily unidirectional transfer of data. The interface eliminates duplication of work between PI and registry initiatives and concurrent maintenance of registry data facilitates an aggressive PI evaluation through loop closure process. Issues are entered into POPIMS within 72 hours of identification and follow the Trauma Program PI Process.

2. Data is entered into POPIMS in a systematic manner. The “meeting” section tab includes a summary of the case, meeting notes, preventability status and standard of care score. These meeting notes help populate the “issues” tab providing a dashboard look, highlighting the circumstances surrounding the issue. This includes location, causative factors, preventability status, system or provider related issue, and loop closure. The “outcome” section indicates if the chart was closed and what corrective action was taken. This space can also be used for documenting information that may enhance issue clarification. Finally, the “refer” section includes all correspondence, whether it is verbal or electronic.

**K. Referral Process for Investigation or Review**

1. The cases determined to require further investigation by the Level I, II, and/or III PI review may be referred to the appropriate hospital department via appointed liaisons, committee or department chairman for review. Issues may also be recommended for further review using the hospital’s Medical Staff Office’s Peer Review Process or referring issues to Patient Safety. Patient Safety will review the issue at their weekly Serious Event Review Panel. The panel will recommend one or all of the following: Peer Review, Quality Improvement Group, or Root Cause Analysis. Those requiring a Root Cause Analysis will have the findings presented at the hospital’s executive Quality Management Committee. The Trauma Program Medical Director is a permanent member of this committee. All feedback is evaluated by the Trauma PI Committee and/or Trauma Medical Director for appropriate loop closure.
L. Trauma Performance Improvement Committee Structure

1. The Trauma Performance Improvement Committee will function as follows: Direct and evaluate all performance improvement activities in collaboration with individual practitioners, committees, and groups. The PI Committee’s goal is to identify and review issues to ensure quality patient care is provided by the entire multidisciplinary team. The committee will systematically monitor/analyze data, and improve patient outcomes through improvement opportunities.

2. The charge of the committee is to identify issues concurrently and/or retrospectively by members of the multidisciplinary team and reported to the Trauma PI Committee for entry into POPIMS. Issues are defined as PTSF required occurrences, audit filters, opportunities for improvement, and user defined issues in POPIMS. These issues are discussed and decisions are made regarding resolution. Issues identified during this process will progress through the PI process with the following elements of loop closure:
   a) Not a clinical issue, loop closed
   b) Track and trend data
   c) Refer to the following forum for staff education:
      1) Trauma Morning Report with assigned educational presentations
      2) Trauma/ACS Morbidity and Mortality Conference
      3) Trauma /ACS Journal Club
      4) Additional provider education as indicated
      5) Trauma Physician Team Meeting
   d) Refer to the following forum for discussion, education, and resolution:
      1) Bi-monthly Trauma Morbidity and Mortality Conference
      2) Monthly Trauma Physician Team Meeting
      3) Trauma Liaison (s)
      4) Hospital directed PI Committees
      5) Trauma Morning Report

3. The Trauma PI Committee and/or the Trauma Program Medical Director works collaboratively with individual multidisciplinary team members to ensure problem identification and loop closure

4. Trauma Performance Improvement Committee meets on a monthly basis. The Committee’s Members include the following:
   a) Trauma Program Medical Director
   b) Trauma Program Integration Specialist and/or Trauma Program Operations Manager as
well as the Trauma Program Coordinator

c). Members of the multidisciplinary team as needed

5. The Trauma Program Integration Specialist will consult with the Trauma Program Medical Director on a regular basis for guidance on issue management. Recommendations and actions plans with associated re-evaluation will be made when areas needing improvement are determined.

M. Operational Staff Responsible for the Trauma Performance Improvement Program

1. The Trauma Medical Director and the Trauma Program Integration Specialist maintain the Trauma Performance Improvement process with data support from the trauma registry. The Trauma Program Coordinator monitors this process. Representatives from the other clinical and hospital departments as well as the hospital Performance Improvement Department participate when appropriate. This ensures multidisciplinary collaboration and compliance with the hospital Performance Improvement Plan.

2. The Trauma Program Medical Director is responsible for chairing the Trauma Performance Improvement Committee and for the initial review of all issues including all deaths, occurrences, audit filters, and user defined issues. The Trauma Program Medical Director is also responsible for coordination of all performance improvement activity relative to clinical departments/physicians as well as associated remedial action. The Trauma Program Medical Director may delegate related Performance Improvement studies.

3. The Trauma Program Integration Specialist is responsible for identification of issues and their initial validation, the maintenance of the trauma PI database (POPIMS) and protection of their confidentiality, facilitating data trends and analysis, and coordinating surveillance of protocols/guidelines/clinical paths. The Trauma Registry will assist the Trauma Program Integration Specialist in these activities. The trauma registry will interface with the Trauma Program Operations Manager, Trauma Program Coordinator, and Trauma Program Integration Specialist to assist with identification of issues using registry filters, and compilation of reports to support the Performance Improvement process.

N. Corrective Action Planning

1. The Trauma Program Medical Director oversees all corrective action planning within their institution.

   a). Structured plans may be created by any of the Trauma PI team members or
committees in an effort to improve sub-optimal performance identified through the PI process. Our goal is to create forward momentum to effect demonstrable outcome change leading to subsequent loop closure. An evaluation and re-evaluation process will be part of the plan according to the hospital’s action plan methodology of plan, do, study, act [PDSA]. Examples of potential corrective action categories are:

1. Organization of Performance Improvement Teams
2. Education
3. Referral to peer group
4. Trending
5. Focused Audit
6. Protocols
7. Counseling
8. Proctoring/change in privileges or credentials
9. External Review
10. Enhanced resources or methods of communication

O. Confidentiality Protection

1. All performance improvement activities and related documents will be considered confidential and protected as specified in PA Peer Review Protection Act 63 P.S.425.1 et seq., Geisinger Medical Center policies and HIPAA.

2. All Performance Improvement information will be clearly labeled “CONFIDENTIAL PEER REVIEW INFORMATION: Data contained in this report or document was generated as part of a peer review process within the scope of 63 P.S.425.1 et seq. and is therefore not subject to discovery during litigation and is confidential. THIS MATERIAL IS NOT TO BE PHOTOCOPIED DUPLICATED OR REDISCLOSED IN ANY MANNER”. MAKE SURE THIS CORRELATES WITH OUR DOCUMENTS

3. No Performance Improvement information will be part of the patient medical record. All Performance Improvement paper documents and electronic information will be kept in a secure location with limited, controlled access.

P. Loop Closure and Re-evaluation

1. Any identified issues will be subject to Level I, II, or III reviews which may result in the formation of an action plan. In order to "close the Performance Improvement loop", the outcome of the corrective action plan will monitored for the expected change and re-evaluated. A Performance Improvement issue will not be considered to be closed until the re-evaluation process demonstrates a measure of performance or change at an acceptable level. "Acceptable level" may be determined by frequency tracking, benchmarking, and variance analysis as decided by the Trauma Medical Director and/or Performance Improvement
committee. Loop closure will be reported to the Trauma Performance Improvement committee and a determination made regarding periodic or continuous monitoring.

2. Final loop closure can occur at any level. Loop closure can be approved by the Trauma Program Medical Director, Trauma Integration Specialist, Trauma Program Operations Manager, or Trauma Program Coordinator.

Q. Integration into Hospital Performance Improvement Process

1. The Trauma Performance Improvement program practices a multi-disciplinary and multi-departmental approach to reviewing the quality of patient care across all departments and divisions. The Trauma Performance Improvement Committee is integrated with and collaborates with the appropriate performance improvement committees as needed.

2. The Trauma PI program will report significant deviations in care and/or systems issues through the hospital’s Quality Management Committee (QMC), Patient Safety, and committees as specified in the hospital’s Quality Improvement plan.

R. Additions to the Trauma Performance Improvement Process

1. Trauma Performance Improvement Plan
2. Audit filter list and methodology
3. Indicator definitions
4. American College of Surgeons Core Measures
Geisinger Medical Center PIPS Levels of Review

Primary Review (Daily)

Responsible Individuals: TPOM, TPC, DIS and TPCMs
Purpose: Issue Identification/Validation
Data:
- Daily Morning Trauma Meeting
- Concurrent Review
- Daily Trauma Rounds
- Concurrent Data Entry
- Retrospective Data Review

Secondary Review (Weekly)

Responsible Individuals: TPMD, TPOM, TPC and DIS
Purpose: Identification, Assessment of issues that require additional review
Data:
- Primary Indicators/Core Measures
- Adverse Events
- Audit Filter Reviews
- Delays in Patient Care
- Interdepartmental Issues

Identification of Issues
- Data Entry into POPIMS
- Action Plan Development
- Immediate Resolution/Feedback

Identification of Issues
- Track and Trend Data
- Set Goals for Loop Closure
- Action Plan Development
- **Action Indicated: Refer to appropriate department or committee for further investigation/peer review**
Geisinger Medical Center PIPS Levels of Review (Continued)

Tertiary Review (Monthly)

Responsible Individuals: Multidisciplinary Team Members

Purpose: Review the efficacy, efficiency, and safety of the care being provided. To provide focused education and constructive peer review.

Data: Multidisciplinary Review performed in a collaborative manner in order to identify and discuss opportunities for improvement. This will allow interdisciplinary implementation of improvement strategies.

- All deaths
- Transfers in and out
- Over/under triage
- Morbidities
- Massive Transfusion Protocols Utilization
- ISS score > 16
- Shock cases

Trauma Program Section Meeting

Trauma Physician Team Meeting

Trauma Program Operations Committee Meeting

Trauma Program Multidisciplinary Meeting (Weekly)

Trauma Morbidity and Mortality Conference (Bi-monthly)

Identification of Issues

- Track and Trend Data
- Action Plan Development and Implementation
- Guideline/Protocol Issues Addressed and/or Changed
- Documentation of issues and discussions are entered into POPIMS
Geisinger Medical Center PIPS Levels of Review (Continued)

**Quaternary Review (Quarterly)**

Purpose: To assist with the review and resolution of those issues most significant to the trauma patient care systems and patient care. Issues which have been reviewed but not resolved by the tertiary review committee may be escalated for review by the appropriate hospital quality committee.

Data: Multidisciplinary review performed in a collaborative manner in order to identify and discuss opportunities for improvement. This will allow for interdisciplinary implementation of improvement strategies.

- Unresolved preventability
- Unresolved resolution in the Tertiary review process
- Patient receiving care over multiple platforms, opportunities for improvement
- Appropriateness of care

**Multidisciplinary Forums**

- System-wide Trauma Morbidity and Mortality Conference (Quarterly)
- Medical Executive Committee
- Outside Peer Review

**Corrective Actions**

- Targeted Education
- Counseling
- Additional/Enhanced Resources
- Peer Review Presentation

- Guideline/Protocol Development/Revision
- External Review
- Ongoing Professional Practice Evaluation
- Change in Provider Privileges
**Indicators: Outcome Audits for the Trauma Liaison Committee**

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## Indicators: Outcome Audits for the Trauma Liaison Committee

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<td>Did patient sustain a gunshot wound to the abdomen and receive non-operative management?</td>
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<td>Trauma Surgeon and EM attending present in Resuscitation Bay within 15 minutes of patient arrival, assuming notification was received 5 minutes prior to the patient arrival.</td>
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<td>Injured patient admitted to a non-surgical service</td>
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<td>Absence of neurological documentation on ED patient with intracranial and/or spinal cord injury</td>
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<td>Absence of vital sign documentation (Temperature, heart rate, blood pressure, respirations, GCS) for any patient in the ED</td>
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<td>Patient transferred in after 3 hours at initial hospital</td>
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<td>Absence of ambulance report for pt. transport by EMS from scene</td>
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<td>Drug or alcohol withdrawal syndrome</td>
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<td>Initial surgery</td>
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<td>(Abdominal/Thoracic/Cranial/Vascular) &gt;</td>
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<td>24 hours after ED arrival.</td>
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<td>Patients with epidural or subdural</td>
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<td>hematoma who receive initial craniotomy</td>
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<td>4 hours after ED arrival, excluding ICP's.</td>
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<td>Patient with c-spine fracture, subluxation,</td>
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<td>or neurological deficit not addressed on admission</td>
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<tr>
<td>Interval of &gt; 8 hours between arrival and initial treatment of blunt open tibial fracture</td>
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<tr>
<td>Non fixation of femoral diaphyseal fracture in adult</td>
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<td>NSG and Orthopedics Response times</td>
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</tbody>
</table>
# Indicator Methodology: Outcome Audits for the Trauma Liaison Committee

<table>
<thead>
<tr>
<th>Indicators:</th>
<th>Indicator Type</th>
<th>Threshold for Review</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Occurrences (See specific calendar)</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data</td>
</tr>
<tr>
<td>Patient required unplanned reintubation within 48 hours of extubation</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data</td>
</tr>
<tr>
<td>Post ED Destination</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Include destinations including ICU, OR, Med Surg, Step Down, Morgue, Transfer to Hospital, Home, and Interventional Radiology. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Discharge Destination</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Include destinations including Home, IPR, SNF, LTAC. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Functional Status at Discharge</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Analyze percentage of FIM completion and ranges 9-12, 16-24, and 25-40. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Mortality and Mortality Rate</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Trauma Patient with gunshot wound or stab wound which does not receive an exploratory laparotomy.</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Patients with a diagnosis of liver/spleen laceration with initial laparotomy &gt; 2 hours of ED arrival</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Readmissions</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td></td>
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</tr>
</tbody>
</table>

Retrospective review of the data reported and entered into POPIMS. Patients include patients readmitted to the hospital within 30 days. They include patients admitted to the trauma department.
<table>
<thead>
<tr>
<th>Scenario</th>
<th>Review Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma Surgeon and EM attending present in Resuscitation Bay within 15 minutes of patient arrival, assuming notification was received 5 minutes prior to the patient arrival.</td>
<td>Scheduled Audit</td>
<td>80%</td>
</tr>
<tr>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. The data report and specific cases (if necessary) will be reviewed by the Trauma Director. The Trauma Director will determine the need for further action.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Trauma Team Response Times**

<table>
<thead>
<tr>
<th>Scenario</th>
<th>Review Type</th>
<th>Frequency</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma patient admitted to hospital under care of admitting or attending physician who is not a surgeon</td>
<td>Scheduled Report</td>
<td>10%</td>
</tr>
<tr>
<td>Retrospective review of trauma registry data. The data report and specific cases (if necessary) will be reviewed by the Trauma Director. The Trauma Director will determine the need for further action.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of neurological documentation on ED patient with intracranial and/or spinal cord injury</td>
<td>Scheduled Report</td>
<td>95%</td>
</tr>
<tr>
<td>Retrospective review of trauma registry data. Further case review if acceptable thresholds not maintained.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of vital sign documentation (Temperature, heart rate, blood pressure, respirations, GCS) for any patient in the ED</td>
<td>Scheduled Report</td>
<td>95%</td>
</tr>
<tr>
<td>Retrospective review of trauma registry data. The data report and specific cases (if necessary) will be reviewed by the Trauma Director. The Trauma Director will determine the need for further action.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Ambulance scene time &gt; 20 minutes</td>
<td>Scheduled Report</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Patient transferred in after 3 hours at initial hospital</td>
<td>Scheduled Report</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Absence of ambulance report for pt. transport by EMS from scene</td>
<td>Scheduled Report</td>
<td>Not applicable</td>
</tr>
<tr>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will include missing data from the Scene, Transport, and Interhospital. Will trend with PTOS data</td>
<td></td>
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</tr>
</tbody>
</table>
## Indicator Methodology: Outcome Audits for the Trauma Liaison Committee

<table>
<thead>
<tr>
<th>Indicators:</th>
<th>Indicator Type</th>
<th>Threshold for Review</th>
<th>Methodology</th>
</tr>
</thead>
<tbody>
<tr>
<td>Over/Under Triage</td>
<td>Scheduled Report</td>
<td>5%</td>
<td>Will review data on the POPIMS report based on closed records from Collector. Will review data typical of the Cribari Matrix. Will review Level I, II, III, and ED consults. Will also review activations (Level I and II) compared to no trauma activations. Will use ACS threshold of 5-10% for under triage and 50-60% for over triage ranges.</td>
</tr>
<tr>
<td>ED LOS for trauma patients</td>
<td>Scheduled Report</td>
<td>Not applicable</td>
<td>Retrospective review of trauma registry data. Will include ED LOS as well as ED LOS for destinations including ICU, Med Surg, and OR. The data report and specific cases (if necessary) will be reviewed by the Trauma Director. The Trauma Director will determine the need for further action.</td>
</tr>
<tr>
<td>LOS</td>
<td>Scheduled Report</td>
<td>Not applicable</td>
<td>Retrospective review of trauma registry data. Will include overall hospital LOS, ICU LOS, and average ventilator days. The data report and specific cases (if necessary) will be reviewed by the Trauma Director. The Trauma Director will determine the need for further action.</td>
</tr>
<tr>
<td>Unplanned Return to the ICU</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data.</td>
</tr>
<tr>
<td>Drug or Alcohol Withdrawal Syndrome</td>
<td>Scheduled Audit</td>
<td>100%</td>
<td>Retrospective review of the Trauma Registry data via reports generated from the Trauma Registry. Will trend with PTOS data.</td>
</tr>
</tbody>
</table>
XVII. PTSF Occurrence Definitions:

**NONE**

01 = None: patient’s hospital course has no identifiable clinical problems. When “01” is recorded the Date and Location elements will be automatically skipped.

**PULMONARY**

20 = Adult Respiratory Distress Syndrome (ARDS): utilize the 2016 NTDB Complication definition for Adult Respiratory Distress Syndrome (ARDS) which states:

- **Timing**: Within 1 week of known clinical insult or new or worsening respiratory symptoms.
- **Chest imaging**: Bilateral opacities – not fully explained by effusions, lobar/lung collapse, or nodules
- **Origin of edema**: Respiratory failure not fully explained by cardiac failure or fluid overload. Need objective assessment (e.g., echocardiography) to exclude hydrostatic edema if no risk factor present
- **Oxygenation** (at a minimum): \( 200 < \text{PaO}_2 / \text{FiO}_2 \leq 300 \) With PEEP or CPAP \( \geq 5 \) cmH2O

21 = Acute Respiratory Failure: The need for prolonged (greater than 96 consecutive hours) ventilatory support after a period of normal non-assisted breathing (minimum of 48 hours) or reintubation.

a. planned - do **not** report (i.e. taken to OR or treatment of inhalation injury)

b. unplanned - report

22 = Aspiration/Aspiration Pneumonia: documented inhalation of gastric contents or other materials followed by clinical and new radiological findings of pneumonitis which requires treatment within 48 hours.

24 = Fat Embolus Syndrome: documented diagnosis by an attending physician in a patient with pelvic or extremity fractures and a decreased PO2.

**One** of the following must also be present:

1. change in mental status,
2. petechial signs,
3. tachypnea,
4. fat in urine, or
5. decreased platelets.

27 = Iatrogenic Pneumothorax: presence of intrapleural air not present on admission radiograph, resulting from treatment or intervention.

28 = Pulmonary Embolus (PE): Defined as a lodging of a blood clot in a pulmonary artery with subsequent obstruction of blood supply to the lung parenchyma. The blood clots usually originate from the deep leg veins or the pelvic venous system. Consider the condition present if the patient has a V-Q scan interpreted as high probability of pulmonary embolism or a positive pulmonary arteriogram or positive CT angiogram.

100 = Pneumonia (does not include VAP (ventilator-assisted pneumonia)): which is defined as a patient with evidence of pneumonia that develops during the hospitalization without clinical evidence of inhalation injury.

Patients with pneumonia must meet at least one of the following two criteria:

**Criterion 1.** Rales or dullness to percussion on physical examination of chest AND any of the following:

a. New onset of purulent sputum or change in character of sputum
b. Organism isolated from blood culture
c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy

**Criterion 2.** Chest radiographic examination shows new or progressive infiltrate, consolidation, Cavitation, or pleural effusion AND any of the following:

a. New onset of purulent sputum or change in character or sputum
b. Organism isolated from the blood
c. Isolation of pathogen from specimen obtained by transtracheal aspirate, bronchial brushing, or biopsy
d. Isolation of virus or detection of viral antigen in respiratory secretions
e. Diagnostic single antibody titer (IgM) or fourfold increase in paired serum samples (IgG) for pathogen
f. Histopathologic evidence of pneumonia

**CARDIOVASCULAR**

34 = **Major Dysrhythmia:** Dysrhythmia requiring drugs or defibrillation. (not resulting in death)

Examples:

- supraventricular tachycardia
- rapid atrial fibrillation
- sustained ventricular tachycardia
- bradycardia requiring pacing

32 = **Extremity Compartment Syndrome:** utilize the NTDB Complication definition for Extremity Compartment Syndrome, defined as a condition not present at admission in which there is documentation of tense muscular compartments of an extremity through clinical assessment or direct measurement of intracompartmental pressure requiring fasciotomy. Compartment syndromes usually involve the leg but can also occur in the forearm, arm, thigh, and shoulder. Record as a complication if it is originally missed, leading to late recognition, a need for late intervention, and has threatened limb viability.

33 = **Deep Vein Thrombosis (DVT):** utilize the NTDB Complication definition for Deep Vein Thrombosis, which states: The formation, development, or existence of a blood clot or thrombus within the vascular system, which may be coupled with inflammation. This diagnosis may be confirmed by a venogram, ultrasound, or CT. The patient must be treated with anticoagulation therapy and/or placement of a vena cava filter or clipping of the vena cava.

35 = **Myocardial Infarction (MI):** utilize the NTDB Complication definition for Myocardial Infarction, which states: The history of a non-Q wave, or a Q wave infarction in the six months prior to injury and diagnosed in the patient’s medical record.)

**HEMATOLOGIC/COAGULOPATHY**

41 = **Coagulopathy** (excluding anticoagulation therapy, coumadin therapy, or underlying hematologic disorders, e.g. hemophilia: uncontrolled diffuse bleeding in the presence of coagulation abnormalities, e.g., increased prothrombin time, increased partial thromboplastin time, decreased platelet count, or disseminated intravascular coagulation (DIC) requiring treatment, i.e., transfusion of components such as platelets, clotting factors, FFP.

**RENA L**
Acute Kidney Injury: utilize the NTDB Complication definition for Acute Kidney Injury, which states: acute kidney injury (AKI) (stage 3), is an abrupt (within 48 hours) reduction of kidney function defined as: increase in serum creatinine (SCr) of more than or equal to 3x baseline OR; increase in SCr to >= 4 mg/dl (>= 353.3 µmol/l) OR; patients > 18 years with a decrease in eGFR to < 35 ml/min per 1.73 m² OR; reduction in urine output of < 0.3 ml/kg/hr for >= 24 hrs OR; anuria for >=12 hrs. OR; requiring renal replacement therapy (e.g., continuous renal replacement therapy (CRRT) or periodic peritoneal dialysis, hemodialysis, hemofiltration, or hemodiafiltration). NOTE: If the patient or family refuses treatment (e.g., dialysis) the condition is still considered to be present if a combination of oliguria and creatinine are present. EXCLUDE patients with renal failure that were requiring chronic renal replacement therapy such as periodic peritoneal dialysis, hemodialysis, hemofiltration, or hemodiafiltration prior to injury.

INFECTION/SEPSIS

Empyema: infection documented by purulent material or positive culture from the pleural space requiring thoracostomy tube drainage.

Sepsis: documented by a physician with at least two or more of the following conditions (which occur at the same time):

1. core temperature of > 38°C or < 36°C
2. white blood cell count > 12,000 or < 4,000 or > 10% immature bands
3. positive blood cultures (excluding contaminants)
4. clinically obvious source of infection
5. heart rate > 90 beats/min or respiratory rate > 20 breaths/min

Acute sinusitis: opacification on x-ray or CT with fever and/or positive purulent drainage requiring treatment.

Soft Tissue Infection: documentation by a physician of cellulitis, gas gangrene, necrotizing fascitis, or streptococcal myositis requiring treatment.

Wound Infection (traumatic or incisional): drainage of purulent material from the wound, active treatment of the wound, or administration of antibiotics for the wound.

An abdominal abscess would not be considered a wound infection and is not applicable as an occurrence.

Urinary Tract Infection (UTI) (not present on admission, NOT including CAUTI (catheter-associated urinary tract infection)): clean voided or other catheter urine specimen with > 100,000 organisms/ml on C/S.
Physician institutes appropriate therapy for a urinary tract infection

An infection is considered Present on Admission (POA) if the date of event of the NHSN site-specific infection criterion occurs during the POA time period, which is defined as the day of admission to an inpatient location (calendar day 1), the 2 days before admission, and the calendar day after admission. CDC guidelines used as reference.

**AIRWAY MANAGEMENT**

80 = Esophageal Intubation (Inhouse Only): endotracheal tube in esophagus and not immediately repositioned. Esophageal location determined by physical exam, x-ray, capnography or endoscopy.

69 = Unrecognized Mainstem Bronchus Intubation: any endotracheal intubation procedure resulting in definitive placement of the tube in either the right or left mainstem bronchus.

   a. recognized and treated immediately - not reportable
   
   b. unrecognized on 2 successive chest x-rays - reportable

**GASTROINTESTINAL**

83 = GI Bleeding: blood loss from anywhere in the GI tract, grossly positive nasogastric (NG) aspirate, or grossly positive stool which requires treatment.

86 = Small Bowel Obstruction (SBO): (excluding ileus) radiographic evidence of dilated loop of bowel with multiple air-fluid levels and confirmed by a surgeon requiring treatment (surgery or NG tube).

**NEUROLOGIC**

64 = CNS Infection: CSF aspirate with positive culture and increased white blood cell count

**PROCEDURE RELATED**

91 = Iatrogenic Organ, Nerve, Vessel: perforation or injury resulting from treatment or intervention.

**DECUBITUS**
65 = **Dehiscence/Evisceration**: breakdown of fascial closure confirmed by discharge of peritoneal fluid, evisceration or palpable fascial defect. This occurrence pertains to the abdominal area only.

94 = **Decubitus ulcer**: Defined as a “pressure sore” resulting from pressure exerted on the skin, soft tissue, muscle, or bone by the weight of an individual against a surface beneath. Individuals unable to avoid development of necrosis and ulceration.

**HYPOTHERMIA**

46 = **Hypothermia**: (nontherapeutic) rectal or core temperature $\leq 34^\circ C$ or $93.2^\circ F$.

If the patient presents to the hospital with hypothermia, the hypothermia is considered a diagnosis. If the hypothermia presents during the hospital stay and is unexpected, the hypothermia is considered an occurrence.

**POST-OPERATIVE HEMORRHAGE**

47 = **Post-Operative Hemorrhage**: requiring operative intervention.

Procedures done in angio to control the hemorrhage should be considered operative interventions and the hemorrhage should be included as an occurrence.

**PHARMACOLOGY**

49 = **Adverse Drug Reaction**: As documented by a physician, plus one of the following:

1. Adversely affects patient care
2. Increases length of stay
3. Increases morbidity and mortality

**BURNS**

*(Only required for burn patients at burn centers)*

10 = **Burn Graft Loss (of any percentage)**: documented by a physician (includes split thickness graft and free flap loss).
11 = **Burn Wound Infection Post Excision:** documented diagnosis by a physician (*after* excision).

12 = **Burn Wound Sepsis (occurring in a burn patient; which is related to the burn):** documented by a physician of drainage of purulent material from the wound, active treatment of the wound, or administration of antibiotics for the wound.

13 = **Burn Wound Cellulitis:** any documented diagnosis by a physician which includes fungal infection.

14 = **Delay In Burn Donor Site Healing :** documented by a physician of any healing which begins *greater than* 14 days post surgical procedure.

15 = **Hypovolemia:** must be documented by a physician.

---

**NTDS HOSPITAL COMPLICATIONS**

201 = **Drug or alcohol withdrawal syndrome:** Defined as a set of symptoms that may occur when a person who has been habitually drinking too much alcohol or habitually using certain drugs (e.g. narcotics, benzodiazepine) experiences physical symptoms upon suddenly stopping consumption. Symptoms may include: activation syndrome (i.e., tremulousness, agitation, rapid heartbeat and high blood pressure), seizures, hallucinations or delirium tremens.

202 = **Unplanned intubation:** Patient requires placement of an endotracheal tube and mechanical or assisted ventilation because of the onset of respiratory or cardiac failure manifested by severe respiratory distress, hypoxia, hypercapnia, or respiratory acidosis. In patients who were intubated in the field or Emergency Department, or those intubated for surgery, unplanned intubate occurs if they require reintubation > 24 hours after extubation.

203 = **Unplanned return to the OR:** Unplanned return to the operating room after initial operation management for a similar or related previous procedure.

204 = **Unplanned admission to ICU:** INCLUDE: patients admitted to the ICU after initial transfer to the floor; patients with an unplanned return to the ICU after initial ICU discharge.
205 = Stroke/CVA: A focal or global neurological deficit of rapid onset and NOT present on admission.

The patient must have at least one of the following symptoms:

1. Change in level of consciousness,
2. Hemiplegia,
3. Hemiparesis,
4. Numbness or sensory loss affecting one side of the body,
5. Dysphasia or aphasia,
6. Hemianopia,
7. Amaurosis fugax,
8. Or other neurological signs or symptoms consistent with stroke

AND

1. Duration of neurological deficit > 24 h
2. OR duration of deficit < 24 h, if neuroimaging (MR, CT, or cerebral angiography) documents a new hemorrhage or infarct consistent with stroke, or therapeutic intervention(s) were performed for stroke, or the neurological deficit results in death

AND

1. No other readily identifiable non-stroke cause, e.g., progression of existing traumatic brain injury, seizure, tumor, metabolic or pharmacologic etiologies, is identified

AND

1. Diagnosis is confirmed by neurology or neurosurgical specialist or neuroimaging procedure (MR, CT, angiography) or lumbar puncture (CSF demonstrating intracranial hemorrhage that was not present on admission).

Although the neurologic deficit must not present on admission, risk factors predisposing to stroke (e.g., blunt cerebrovascular injury, dysrhythmia) may be present on admission.

206 = Cardiac Arrest with CPR = utilize the NTDB Complication definition for Cardiac Arrest with CPR, which states: Cardiac arrest is the sudden cessation of cardiac activity after hospital arrival. The patient becomes unresponsive with no normal breathing and no signs of circulation. If corrective measures are not taken rapidly, this condition progresses to sudden death.

INCLUDE patients who have had an episode of cardiac arrest evaluated by hospital personnel and
received compressions or defibrillation or cardioversion or cardiac pacing to restore circulation.

207 = Ventilator-Assisted Pneumonia = utilize the NTDB Complication definition for Ventilator-Assisted Pneumonia, which states: A pneumonia where the patient is on mechanical ventilation for >2 calendar days on the date of event, with day of ventilator placement being Day 1, AND

The ventilator was in place on the date of event or the day before. If the patient is admitted or transferred into a facility on a ventilator, the day of admission is considered Day 1.

See 2016 NTDB Data Dictionary for VAP algorithm.

208 = Catheter Associated Urinary Tract Infection (CAUTI) = utilize the NTDB Complication definition for Catheter Associated Urinary Tract Infection, which states: Catheter-associated Urinary Tract Infection (Consistent with the January 2015 CDC defined CAUTI): A UTI where an indwelling urinary catheter was in place for >2 calendar days on the date of event, with day of device placement being Day 1, AND

An indwelling urinary catheter was in place on the date of event or the day before. If an indwelling urinary catheter was in place for >2 calendar days and then removed, the date of event for the UTI must be the day of discontinuation or the next day for the UTI to be catheter-associated.

209 = Central line-associated bloodstream infection (CLABSI) = utilize the NTDB Complication definition for Central line-associated bloodstream infection (CLABSI), which states: (Consistent with the January 2014 CDC Defined CLABSI): A laboratory-confirmed bloodstream infection (LCBI) where central line (CL) or umbilical catheter (UC) was in place for >2 calendar days on the date of event, with day of device placement being Day one.

A CL or UC was in place on the date of event or the day before. If a CL or UC was in place for >2 calendar days and then removed, the LCBI criteria must be fully met on the day of discontinuation or the next day. If the patient is admitted or transferred into a facility with a central line in place (e.g., tunneled or implanted central line), and that is the patient’s only central line, day of first access as an inpatient is considered Day 1. “Access” is defined as line placement, infusion or withdrawal through the line.

See NTDB Data Dictionary for CDC Criterion
XVIII. PTSF Audit Filters

Definitions of the audit filters provided in your COLLECTOR version are given on the following pages. ACS filters are indicated by ACS in parenthesis. JCAHO clinical indicators are indicated by JCAHO in parenthesis.

Ambulance scene time > 20 minutes (ACS Audit Filter #1)

- Trauma Patient; AND
- Transport from Scene (SCENE_TRANSP) = 1 (Ambulance), 2 (Helicopter), 3 (Ambulance/Helicopter) or 5 (Fire Rescue); AND
- Arrive at Scene Time (SCENE_ARRIVE_TIME) to
- Leave Scene Time (SCENE_LEAVE_TIME) > 20 minutes.
- If the response to “Were scene provider and transport provider the same?” is a 1 (yes) then just the Scene Section Arrive and Leave dates and times are used to calculate the time.
- If the response to “Were scene provider and transport provider the same?” is a 2 (no) then the earliest Arrive date and time in either the Scene or Transport section and the Leave date and time in the Transport section are used to calculate the time.

Interhospital times are not utilized.

Absence of ambulance report on medical record for patient transported by EMS from scene (ACS Audit Filter #2)

- Transport from Scene (SCENE_TRANSP) = 1 (Ambulance), 2 (Helicopter), 3 (Ambulance/Helicopter) or 5 (Fire Rescue); AND
- Patient Care Record in Patient Medical Record from Scene (SCENE_RUN_FORM) = 2 (No).
- If the response to “Were scene provider and transport provider the same?” is a 1 (yes) then just the Scene Section “Patient Care Record in Medical Record” is used to determine the absence.
- If the response to “Were scene provider and transport provider the same?” is a 2 (no) then just the Transport Section “Patient Care Record in Medical Record” is used to determine the absence.

The Interhospital Section is not utilized.

Patient with admission GCS < 14 who does not receive a CT of the head (ACS Audit Filter #3)
Trauma Patient; AND

- GCS on Admission (GCS_A) < 14; AND

"Did patient receive a CT scan of the head?" (CT_SCAN) = 2 (No).

Absence of sequential neurological documentation on emergency department record of trauma patient with a diagnosis of skull fracture or intracranial injury (ACS Audit Filter #4a)

Trauma Patient; AND

- Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) =
  800.xx, 801.xx, 803.xx, 804.xx, 850.xx, 851.xx, 852.xx, 853.xx or 854.xx; AND

"Is there sequential neurological documentation on ED record of trauma patient with admission diagnosis of skull fx, intracranial injury, or spinal cord injury?"

- (NURS_N_DOC) = 2 (No).

Absence of sequential neurological documentation on emergency department record of trauma patient with a diagnosis of spinal cord injury (ACS Audit Filter #4b)

Trauma Patient; AND

- Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) =
  806.xx, 952.0x, 952.1x, 952.2-952.4, 952.8 or 952.9; AND

"Is there sequential neurological documentation on ED record of trauma patient with admission diagnosis of skull fx, intracranial injury, or spinal cord injury?" (NURS_N_DOC) = 2 (No).

Absence of hourly documentation of blood pressure, pulse and respiration for any trauma patient beginning with arrival in ED, including time spent in radiology, up to admission to the ward, floor, OR, or ICU; death; or transfer to another hospital (ACS Audit Filter #5)
"Is there hourly documentation beginning with ED arrival?" (NURS_DOC_S) = 2 (No).

Patient left ED with a discharge GCS ≤ 8 and without a definitive airway established (ACS Audit Filter #6)

Trauma Patient; AND

• Post ED Destination (POST_ED_D) ≠ 6 (Morgue); AND

"Did patient leave ED with a discharge GCS ≤ 8?" (ED_GCS_8) = 1 (Yes); AND

"If yes, did patient leave ED with definitive airway?" (ED_AIRWAY) = 2 (No).

Patient seen in ED, discharged and then admitted to the hospital within 72 hours of initial evaluation (ACS Audit Filter #7)

ACS AUDIT FILTER #7 IS NOT USED BY PTOS.

Any patient sustaining a GSW to the abdomen who is managed non-operatively (ACS Audit Filter #8)

Trauma Patient; AND

"Did patient sustain a gunshot wound to the abdomen and receive non-operative management?" (NONOP_GSWA) = 1 (Yes).

Patient requiring laparotomy which is not performed within 2 hours of ED arrival (ACS Audit Filter #9)

Trauma Patient; AND

"Did patient require a laparotomy that was not performed within 2 hours of ED arrival?"

(LAPAROT) = 1 (Yes).

Patient with epidural or subdural brain hematoma receiving initial craniotomy > 4 hours after arrival at ED, excluding those performed for ICP monitoring (ACS Audit Filter #10)
Trauma Patient; AND

• Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) = 800.2x, 800.7x, 801.2x, 801.7x, 803.2x, 803.7x, 804.2x, 804.7x, or 852.20-852.59; AND

• Any Operative procedure (PROC_01_PR ...PROC_84_PR) = 01.21-01.25, 01.31-01.39, 01.41, 01.42, 01.51-01.59, 01.6, 02.0x, 02.1x, 02.91-02.93, or 02.99; AND the associated time for the earliest (initial qualifying Operative procedure (e.g., O_1_P1_DATE, O_1_P1_TIME) is greater than 4 hours after ED arrival (EDA_DATE, EDA_TIME).

Patient transferred in after 3 hours at initial hospital (ACS Audit Filter #11a)

"Is this a transfer patient?" (TRANSF_PT) = 1 (Yes); AND

• Time from Arrival at Referring Hospital (DATE_REF_AR, TIME_REF_AR) to Departure from Referring Hospital > 3 hours (DATE_REF_DP, TIME_REF_DP).

Patient transferred out after 3 hours from ED arrival (ACS Audit Filter #11b)

Discharge Status (DIS_STATUS) = 6 (Survivor); AND

• Discharge Destination (DISCG_TO) = 2 (Other Hospital), 3 (Trauma Center), 6 (Burn Center), 14 (Pennsylvania Trauma Center) or 15 (Out of State Trauma Center) AND

• Time from ED Arrival (EDA_DATE, EDA_TIME) to Discharge (D_C_DATE, D_C_TIME) > 3 hours.

Initial abdominal, intrathoracic, vascular, or cranial surgery performed > 24 hours after ED arrival (ACS Audit Filter #13)

Trauma Patient; AND
• "Abdominal Surgery > 24 Hours" (ABD_GT_24) = 1 (Yes); OR
• "Intrathoracic Surgery > 24 Hours" (THOR_GT_24) = 1 (Yes); OR
• "Vascular Surgery > 24 Hours" (VASC_GT_24) = 1 (Yes); OR
• "Cranial Surgery > 24 Hours" (CRAN_GT_24) = 1 (Yes).

Unplanned return to the operating room within 48 hours of initial procedure (ACS Audit Filter #14)

ACS FILTER #14 IS NOT USED BY PTOS

Trauma patient admitted to hospital under care of admitting or attending physician who is not a surgeon (ACS Audit Filter #15a)

Trauma Patient; AND

• Admitting Service (ADM_SERV) = 6 (Other Non-Surgical) or 9 (Burn Service)

Burn patient with inhalation injury not admitted to burn or pulmonary service (ACS Audit Filter #15b)

Burn Patient; AND

• Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) = 987.9; AND
• Not Admitted to Burn Service (ADM_SERV ≠ 9) or Pulmonary (ADM_SRV_NS ≠ "Pulmonary")

Nonfixation of femoral diaphyseal fracture in adult trauma patient (ACS Audit Filter #16)

Trauma Patient; AND

• Derived Age (AGE) ≥ 15; AND
• Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) = 821.01 or 821.11;
AND

• NO Procedure (PROC_01_PR ...PROC_84_PR) = 78.15, 78.55, 79.05, 79.15 or 79.35.

Patient developing deep vein thrombosis, pulmonary embolism, or decubitus ulcer (ACS Audit Filter #17)

ACS FILTER #17 IS NOT USED BY PTOS

Any patient requiring reintubation within 48 hours of extubation (ACS Audit Filter #18)

• "Was reintubation required within 48 hours of extubation?" (REINTUBAT) = 1 (Yes).

Specific occurrences (ACS Audit Filter #19)

• Any Occurrences (COMPLIC_1, COMPLIC_2, ... COMPLIC_10) valued and ≠ 01 (None).

Patient with diagnosis at discharge of cervical spine fracture, subluxation, or neuro deficit not addressed on admission (ACS Audit Filter #20)

Trauma Patient; AND

• "Did patient have discharge diagnosis of cervical spine fracture, subluxation, or neuro deficit not addressed on admission?" (MISSED_CS) = 1 (Yes).

All deaths (ACS Audit Filter #21)

• Discharge Status (DIS_STATUS) = 7 (Dead).

Adult patient receiving transfusion of platelets or fresh frozen plasma within 24 hours of ED arrival after having received < 8 units of packed red blood cells or whole blood (ACS Audit Filter #22)

ACS FILTER #22 IS NOT USED BY PTOS
Burn patient with inhalation injury and not intubated (ACS Audit Filter #23)

Burn Patient; AND

- Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) = 987.9; AND
- Intubated with Artificial Airway (INTUBAT_A) \(\neq\) 1 (Yes).

Burn patient with initial escharotomy performed > 8 hours after admission (ACS Audit Filter #24)

ACS FILTER #24 IS NOT USED BY PTOS

Burn Patient; AND

- Any Operative procedure (PROC_01_PR ...PROC_84_PR) or Non-operative procedure (NON_OP_P1, ... NON_OP_P48) = 86.09; AND the associated time for the earliest (initial qualifying Operative procedure e.g., O_1_P1_DATE, O_1_P1_TIME or Non-operative procedure e.g., NOP_1_DATE, NOP_1_TIME) is greater than 8 hours after ED arrival
- (EDA_DATE, EDA_TIME).

Trauma patient with prehospital EMS scene time > 20 minutes (JCAHO Clinical Indicator #1)

Same definition as ACS Audit Filter #1.

Trauma patient with BP, pulse rate, respiration, and GCS not documented in ED record on arrival and hourly until inpatient admission to the floor, OR, specialty care unit, death, or transfer to another care facility (JCAHO Clinical Indicator #2)

Same definition as ACS Audit Filter #5.

Comatose patient (discharge GCS \(\leq\) 8) discharged from ED prior to establishment of a definitive airway (JCAHO Clinical Indicator #3)
Same definition as ACS Audit Filter #6.

Trauma patient with diagnosis of intracranial injury and altered state of consciousness upon ED arrival receiving initial head CT scan > 2 hours after ED arrival (JCAHO Clinical Indicator #4)

Same definition as ACS Audit Filter #3.

Trauma patient with diagnosis of extradural or subdural brain hemorrhage undergoing initial craniotomy > 4 hours after ED arrival, excluding ICP monitoring (JCAHO Clinical Indicator #5)

Same definition as ACS Audit Filter #10.

Trauma patient with open fractures of long bones as a result of blunt trauma receiving initial surgical treatment > 8 hours after ED arrival (JCAHO Clinical Indicator #6)

• Type of Injury (INJ_TYPE) = 1 (Blunt); AND
• Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ..., ICD9_27) = 812.1x, 812.3x, 812.5x, 813.1x, 813.3x, 813.5x, 813.9x, 818.10, 820.1x, 820.3x, 820.90, 821.1x, 821.3x, 823.1x, 823.3x or 823.9x; AND
• Any Operative Procedure (OPER_1_P1, ..., OPER_3_P12) = 78.02, 78.03, 78.05, 78.07, 78.12, 78.13, 78.15, 78.17, 78.42, 78.43, 78.45, 78.47, 78.52, 78.53, 78.55, 78.57, 79.11, 79.12, 79.15, 79.16, 79.21, 79.22, 79.25, 79.26, 79.31, 79.32, 79.35, 79.36, 79.51, 79.52, 79.55, 79.56, 79.61, 79.62, 79.65 or 79.66; AND the associated time for the earliest (initial) qualifying Operative procedure (e.g., O_1_P1_DATE, O_1_P1_TIME) is greater than 8 hours after ED arrival (EDA_DATE, EDA_TIME).

Trauma patient with diagnosis of liver or spleen laceration undergoing initial laparotomy > 2 hours after ED arrival (JCAHO Clinical Indicator #7)

Trauma Patient; AND

• Any ICD-9-CM diagnosis code (ICD9_01, ICD9_02, ... ICD9_27) =
864.02-864.04, 864.12-864.14, 865.02-865.04 or 865.12-865.14; AND
• Any Operative procedure (PROC_01_PR ...PROC_84_PR) is = 41.43,
• 41.5, 41.95, 50.22, 50.3, 50.61 or 50.69; AND the associated time for the
• earliest (initial) qualifying Operative procedure (e.g., O_1_P1_DATE,
• O_1_P1_TIME) is greater than 2 hours after ED arrival (EDA_DATE, EDA_TIME).

Trauma patient undergoing laparotomy for wounds penetrating the abdominal wall (gunshot and stab wounds) (JCAHO Clinical Indicator #8)

Trauma Patient; AND

• "Did patient sustain a gunshot wound to the abdomen and receive non-operative management?" (NONOP_GSWA) = 1 (Yes); OR
• "Did patient sustain a stab wound to the abdomen and receive non-operative management?" (NONOP_STAB) = 1 (Yes).

Trauma patient transferred in after 3 hours at initial hospital (JCAHO Clinical Indicator #9a)

Same definition as ACS Audit Filter #11a.

Trauma patient transferred out after 3 hours from ED admission (JCAHO Clinical Indicator #9b)

Same definition as ACS Audit Filter #11b.

Adult trauma patient with femoral diaphyseal fractures treated by nonfixation technique (JCAHO Clinical Indicator #10)

Same definition as ACS Audit Filter #16.
Intrahospital mortality of trauma patient with 1 or more of the conditions who did not undergo a procedure for the condition: tension pneumothorax, hemoperitoneum, hemothoraces, ruptured aorta, pericardial tamponade, and epidural or subdural hemorrhage \textit{(JCAHO Clinical Indicator #11)}

Trauma Patient; AND

• "Is this a transfer patient?" (TRANSF_PT) = 2 (No); AND

• Discharge Status (DIS_STATUS) = 7 (Dead); AND

• If any of the fields (COND_1, COND_2, ... COND_6) associated with the question:
  "If patient had one or more of the following conditions, did he/she undergo a procedure for the condition(s)?" = 2 (No).

Trauma patient who expired within 48 hours of ED arrival, with autopsy performed \textit{(JCAHO Clinical Indicator #12)}

Trauma Patient; AND

• Discharge Status (DIS_STATUS) = 7 (Dead); AND

• "Source of Final Anatomical Diagnoses: Autopsy" (AUTOPSY_YN) = 1 (Yes); AND

• Time from ED arrival (EDA_DATE, EDA_TIME) to death (DATE_DEATH, TIME_DEATH) \(\leq\) 48 hours.
XVIII. Opportunities for Improvement

Beginning in 2016, the PTSF Outcomes Committee has approved the following list of Opportunities for Improvement that is entered into POPIMS:

- Airway: Delay in securing/maintaining
- Airway: Reintubation
- Airway: Self Extubation
- AMA/Elopement
- Blood Bank: Other Issues
- Blood Bank: Transfusion issue
- Blood Bank: Availability/Massive Transfusion
- Burn Care Issues
- Case Management: Other
- Case Management: Insurance Issue
- Communication: Interdisciplinary
- Communication: Lack of appropriate patient/family communication

- Communication: Lack of documentation
- Communication: Lack of Social Worker Involvement
- Consultant: Delay in Evolution
- Consultant: Delay in Treatment
- Delay: Completion of work-up
- Delay: Diagnosis
- Delay: Diagnostic studies
- Delay: Subspecialty consultation
- Delay: Physical Therapy/Rehabilitation
- Delay: Trauma team arrival
- Delay: Trauma team notification
- Delay: Treatment
Opportunities for Improvement List

- Delay: Discharge
- DVT/PE Prophylaxis: Inappropriate
- Equipment: Failure
- Equipment: Unavailable
- Fall
- Hemorrhage Control
- Inappropriate use of CT
- Infection: Central Line
- Infection: Nosocomial (Other)
- Missed Diagnosis
- Monitoring: Inappropriate
- Nursing: Delay in notification of patient event
- Nursing: Documentation issue
- Nursing: Medication issue
- Nursing: Transfusion issue
- Nutrition issues
- OR Delay: Other
- OR Delay: Anesthesia Availability
- Subspecialist: Judgment Issue
- Subspecialist: Technical Issue
- Hypothermia: Inappropriate assessment
- Hypothermia: Inappropriate warming measures
- Immobilization: Inappropriate or inadequate
- Inappropriate transfer to Floor/ICU
- OR Delay: Availability
- OR Delay: Resuscitation
- OR Delay: Transportation
- Organ Procurement Issues
- Pain management issues
- Pharmacy: Other Issues
- Pharmacy: Delay in providing necessary medication
- Pharmacy: Medication issue
- Post discharge: Other
- Post discharge: DVT/PE
- Post discharge: Infection
- Professional Behavior: Inappropriate
- Physician - Documentation Issue
- Subspecialist: Deviation from guidelines/protocols
Opportunities for Improvement List

- Subspecialist: Lack of appropriate patient/family communication
- Subspecialist: Post ED destination inappropriate
- Transfer Delay: Time Unjustified
- Trauma Surgeon: Judgment Issue
- Progression of Original Neurological Insult
- Radiology Delay: Interventional Radiology
- Radiology Interpretation: Delay
- Radiology Interpretation: Issue
- Radiology Imaging Delay: CT
- Radiology Imaging Delay: Plain Film
- Readmission: Unplanned
- Trauma Surgeon: Technical
- Trauma Surgeon: Deviation from guidelines/protocols
- Trauma Surgeon: Lack of Resident/PA Supervision
- Trauma Surgeon: Post ED destination inappropriate
- Triage: Over
- Triage: Under
- Resuscitation: Lack of Vascular Access
- Resuscitation: Over
- Resuscitation: Under
- Spine Clearance: Delay
- Spine Clearance: Protocol Not Followed
- Transfer to Higher Level of Care