Reverification Site Visit
Level II Trauma Center

<table>
<thead>
<tr>
<th>Name of Facility</th>
<th>Good Shepherd Medical Center</th>
</tr>
</thead>
<tbody>
<tr>
<td>Longview, Texas</td>
<td></td>
</tr>
</tbody>
</table>

| Site Visit ID Number             | 6140                        |

| Chief Executive Officer          | Steve Altmiller             |
| Medical Director                 | Todd Waltrip, MD FACS       |
| Program Manager                  | Missie Pirtle, RN           |

| Survey Dates                     | August 14-15, 2014          |

| ACS Surveyors                    | Fred Luchette, MD FACS     |
|                                  | Randall Fries, MD FACS     |
|                                  | Ronald Maio, MD FACEP      |
|                                  | Connie Mattice, RN        |
TABLE OF CONTENTS

EXECUTIVE SUMMARY
I. PURPOSE OF REVIEW
II. HOSPITAL INFORMATION
III. PREHOSPITAL SYSTEM
IV. TRAUMA SERVICE
V. HOSPITAL FACILITIES
VI. SPECIALTY SERVICES
VII. PERFORMANCE IMPROVEMENT AND PATIENT SAFETY PROGRAM
VIII. EDUCATIONAL ACTIVITIES, OUTREACH PROGRAMS, AND PREVENTION
IX. RESEARCH
X. CHART REVIEW PROCESS
XI. CASE REVIEWS
EXECUTIVE SUMMARY

Good Shepherd Medical Center in Longview, Texas was reviewed on August 14-15, 2014 by Drs. Fred Luchette, Randall Friese, Ronald Maio, and Ms. Connie Mattice, for reverification as a Level II trauma center. This hospital provides trauma care for adults only. The findings of the reviewers are as follows.

Deficiencies

(1) 16.7 The results of analysis and corrective strategies are not documented. (Type II)

Strengths

(1) Trauma medical director (TMD)
(2) The talented and energetic leadership of the trauma program manager (TPM)
(3) Hospital administration’s commitment to the trauma program
(4) The recruitment of a fellowship trained orthopaedic trauma surgeon
(5) Hospital support for nursing education in the emergency department (ED), postanesthesia care unit, and intensive care unit
(6) The excellent rehabilitation service
(7) Commitment of the emergency medicine physicians to the trauma program
(8) The conversion rate for organ donation

Weaknesses

(1) The response time for level 2 activations is excessive and needs to be appropriate for the patients’ injuries.
(2) The performance improvement (PI) program is immature and occasionally misses serious patient care issues during the review of care.
(3) There are a limited number of trauma surgeons on the call panel.
(4) The injury prevention coordinator’s position is heavily weighted (80%) to sports medicine activities.
(5) The trauma service lacks a cohesive structure.
(6) The documentation of corrective action plans and loop closure in the PI minutes is limited.
(7) The PI minutes are sparse and lack detail about the discussions.
(8) There is limited use of practice management guidelines.
(9) The alcohol screening program does not use a scoring tool.
(10) There is little nursing documentation of the patient I&Os during the ED stay.
(11) There is not an identified OR during the daytime for the injured patient.
(12) There is not consistent participation from neurosurgery, orthopaedics, and emergency medicine in the trauma program operational process performance committee.

Recommendations

(1) Establish a response time for the level 2 activations that allows for optimal care of patients.
(2) The PI program should develop a process that allows for thorough and detailed review of
(3) The hospital should consider recruiting additional trauma surgeons.
(4) The injury prevention coordinator’s job description should be revised to include more time for population based injury prevention programs.
(5) The trauma surgeons should practice as a group and team rather than as individual practitioners.
(6) The documentation of discussions from the PI meetings should be complete and comprehensive.
(7) Increase the number of practice management guidelines and monitor compliance.
(8) The alcohol screening program should utilize trained interventionists and established screening tools.
(9) Nursing documentation by the ED nursing must consistently include I&Os.
(10) There should be a specific OR identified each day for an injured patient.

Fred Luchette, MD, FACS

Randall Friese, MD, FACS

Ronald Maio, MD, FACEP

Connie Mattice, RN, MSN
I. PURPOSE OF REVIEW

Good Shepherd Medical Center (GSMC) in Longview, Texas was reviewed on August 14-15, 2014 by Drs. Fred Luchette, Randall Friese, Ronald Maio, and Ms. Connie Mattice, for reverification as a Level II trauma center. This hospital provides trauma care for adults only. The review was requested by GSMC. The state of Texas is the designating agency. The reporting year for the review was May 1, 2013 to April 3, 2014.

The last review reverification review was conducted on August, 2011 by Drs. Anna Ledgerwood, Mary McCarthy, John Drstvensek, and Alice Gervasini. There were seven criterion deficiencies and six weaknesses identified. Drs. McCarthy and James Hurst performed a focused review in 2012 and determined that the seven deficiencies were corrected.

Changes in leadership personnel since the last review that have occurred impacting the trauma program include the appointment of a new president/chief executive officer for the Good Shepherd Health System, a new chief financial officer, a new vice president of business development, and new chief nursing officer.

During the prereview meeting, the site surveyors met with the following members of the trauma program.

<table>
<thead>
<tr>
<th>Name</th>
<th>Position</th>
</tr>
</thead>
<tbody>
<tr>
<td>Todd Waltrip, MD</td>
<td>Trauma Medical Director</td>
</tr>
<tr>
<td>Missie Pirtle, RN</td>
<td>Trauma Program Manager</td>
</tr>
<tr>
<td>Stan Upchurch, MD</td>
<td>Emergency Medicine Liaison</td>
</tr>
<tr>
<td>Andrew Martin, MD</td>
<td>Radiology Liaison</td>
</tr>
<tr>
<td>Brad Butler, MD</td>
<td>Anesthesia Liaison</td>
</tr>
<tr>
<td>Narasimha Jatavallabhula, MD</td>
<td>Neurosurgery Liaison</td>
</tr>
<tr>
<td>Ron Short, MD</td>
<td>Executive Vice President/Chief Administrative Officer</td>
</tr>
<tr>
<td>Patti Bennett, MSN</td>
<td>Chief Nursing Officer/Senior Vice President</td>
</tr>
<tr>
<td>Dancel Maxwell, MSN</td>
<td>Divisional Director Emergency Services</td>
</tr>
<tr>
<td>Andrea Greathouse, BS</td>
<td>Trauma Registrar</td>
</tr>
<tr>
<td>Jake Brown, MD</td>
<td>Assistant Director Longview Emergency Department</td>
</tr>
</tbody>
</table>

During this meeting, the verification program was reviewed, and the prereview questionnaire was discussed in detail. Important issues that were addressed included the adjustments that GSMC has made in response to the Affordable Care Act, concerns identified during the chart review regarding patient care, and local political and financial factors impacting the hospital.

II. HOSPITAL INFORMATION

GSMC is a community, not-for-profit hospital. It has an affiliation with University of Texas such that GSMC offers an independent residency program for training in internal medicine.
The payer mix for the hospital is as follows.

<table>
<thead>
<tr>
<th>Payer</th>
<th>All Patients (%)</th>
<th>Trauma Patients (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Commercial</td>
<td>13</td>
<td>14</td>
</tr>
<tr>
<td>Medicare</td>
<td>21</td>
<td>18</td>
</tr>
<tr>
<td>Medicaid</td>
<td>27</td>
<td>20</td>
</tr>
<tr>
<td>HMO/PPO</td>
<td>10</td>
<td>11</td>
</tr>
<tr>
<td>Uncompensated</td>
<td>27</td>
<td>33</td>
</tr>
<tr>
<td>Other</td>
<td>2</td>
<td>4</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>100</strong></td>
<td><strong>100</strong></td>
</tr>
</tbody>
</table>

The "other" category includes other government plans, Workers Compensation, and Good Shepherd/Risk Management.

All of the trauma activities are on one campus. The bed status for the hospital is as follows:

<table>
<thead>
<tr>
<th>Hospital Beds</th>
<th>Adult</th>
<th>Pediatric</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Licensed</td>
<td>406</td>
<td>19</td>
<td>425</td>
</tr>
<tr>
<td>Staffed</td>
<td>362</td>
<td>19</td>
<td>381</td>
</tr>
<tr>
<td><strong>Average Census</strong></td>
<td><strong>265</strong></td>
<td><strong>8</strong></td>
<td><strong>273</strong></td>
</tr>
</tbody>
</table>

The hospital has the commitment of the institutional governing body and the medical staff to continue as a trauma center. There are resolutions supporting the trauma program from both the hospital administration and the medical executive committee. Budgetary, administrative, and medical staff commitment are evident.

There is involvement by the trauma program staff in state/regional trauma system planning, development, and operation.

**III. PREHOSPITAL**

There are three Level III and four Level IV trauma centers in the primary catchment area. These are centers that treat trauma patients as appropriate for their level of service and designation. GSMC accepts transfers from all facilities in this area to provide a higher level of trauma care including neurosurgery, oral maxillofacial surgery, and critical care. GSMC also has a Level IIIa neonatal intensive care unit (ICU) and high-risk pregnancy unit and is a referral center for high-risk obstetrical trauma.

The day-to-day authority over emergency medical services (EMS) is assigned to the Longview Fire Department. EMS is governed by the Longview city manager and Longview city council. Treatment protocols are determined in conjunction with their EMS medical director, Dr. Greg Harrington. Dr. Harrington is an emergency department (ED) staff member at the GSMC. There are four air medical support services available in the primary and secondary catchment areas. Air One has three helicopters. They are stationed in Tyler, Athens and Mt. Pleasant. Flight for Life has two helicopters. They are stationed in Palestine and Longview. LifeNet has one helicopter in Texarkana. Life Air Rescue has one helicopter in Shreveport, Louisiana. The hospital does not serve as a base station for EMS operations. Medical control is provided by the hospital.

The trauma program team is involved in prehospital training. The EMS medical directors for Longview EMS and Champion EMS assist with the training and PI activities for the EMS services. Additional educational opportunities are provided to local EMS providers through GSMC's Center for Innovative Learning and Simulation Lab. GSMC serves as the clinical site for EMT-B, EMT-I, and EMT-P training for Kilgore Junior College and Champion EMS. GSMC
participates in city-wide and regional disaster drills and bioterrorism exercises. GSMC participates in the critique of drills with EMS and city agencies involved in prehospital care. Follow-up information is shared with prehospital providers related to patients treated at GSMC on a need-to-know basis and in compliance with HIPPA regulations.

The trauma program team participates in prehospital care protocol development and the PIPS program. Longview EMS, Champion EMS, and other EMS providers as appropriate are represented at the trauma systems committee to address quality issues and provide loop closure. GSMC participates in disaster and city-wide exercises. The debriefing includes prehospital, hospital, law enforcement, and other agencies who come together to identify opportunities for improvement and make procedural changes. GSMC actively participates in a regional advisory committee to address quality issues identified and facilitate quality trauma care in the region.

IV. TRAUMA SERVICE
A. TRAUMA MEDICAL DIRECTOR (TMD)

The TMD, Dr. Todd Waltrip, graduated from Baylor College of Medicine in 1994, and completed his residency in surgery at the University of Louisville School of Medicine in 2000. He is board certified in surgery, a Fellow of the American College of Surgeons, and is current in ATLS as a provider. His external trauma continuing medical education (CME) for the last 3 years is adequate. He is a member of the Eastern Association for the Surgery of Trauma. The TMD participates in trauma call. During the reporting year, he admitted 54 patients, with 39 having an injury severity score (ISS) greater than 15. Twelve of these required operative intervention.

Dr. Waltrip reports to the chief administration officer of the organization. He also attends the executive committee meetings to resolve trauma-related issues as needed. He has the authority and administrative support to lead all aspects of the program.

B. TRAUMA SURGEONS

Including Dr. Waltrip, there are four board-certified surgeons taking trauma call, and no one else. The trauma surgeon core group is adequately defined by the TMD. Trauma-related CME is performed by using an internal educational process and over the past 3 years has been adequate for the trauma surgeons on the call panel. All of the general surgeons on the trauma team have successfully completed the ATLS course at least once. Dr. Waltrip is current with his ATLS certification, expiring in 2015. While on call, the trauma surgeon is dedicated to the trauma center without responsibilities at other facilities. There is a published backup call schedule for the trauma surgeons.

The expectation for surgeon response to level 2 trauma activations is 24 hours. This issue was discussed with the TMD and the chief administrative officer. The hospital is in the process of redefining this expectation. The emergency physicians and trauma surgeons are knowledgeable in trauma care principles whether treating locally or transferring to a center with more resources.

C. TRAUMA PROGRAM MANAGER (TPM)

Missie Pirtle, RN, the TPM, has an associate nursing degree and has been in her full time position for 3 years. She has an extensive defined job description with five personnel in a supporting role. She reports to the TMD and administration. She shows evidence of educational preparation and clinical experience in the care of injured patients. Ms. Pirtle is effective in the role of TPM.
D. TRAUMA SERVICE

There is a trauma service at GSMC; however, the service is loosely defined with little overlap or multidisciplinary team development. There is surgical commitment to the trauma center. The TMD oversees all aspects of trauma care through interaction with the trauma program coordinator, interaction with the trauma surgeon panel, case managers and through the trauma committees. There are no multidisciplinary rounds, nor does the TMD formally round on/evaluate patients admitted by other trauma surgeons.

Seriously injured patients are admitted to, or evaluated by a trauma surgeon. The patients are seen daily by the admitting trauma surgeon. On weekends and holidays there is cross coverage. The trauma service at GSMC consists of the TMD, trauma coordinator, support personnel, and trauma call panel. The trauma registry records patients admitted to non-trauma surgical services as part of the trauma service.

A contractual relationship exists between the hospital and trauma surgeons to cover trauma call, medical directorship, and program oversight. The emergency physicians are contracted to provide emergency care. All other subspecialties are covered by board certified or board eligible physicians through a call schedule.

The hospital has additional credentialing criteria for serving on the trauma panel, and these include the following.

- Each physician must be fully credentialed as a member of GSMC medical staff.
- Board certification or board eligibility is required unless the physician has been approved for the alternate pathway.
- Each physician's file is reviewed through the trauma PI committee and the executive committee for his/her service.
- The physicians' trauma-related requirements are reviewed by the TMD and the trauma PI committee and if the physician meets criteria, he/she is recommended for the trauma panel to the executive committee of the medical staff.
- The TMD reviews each physician's file and monitors compliance to trauma care guidelines.
- If any surgeon is found to be noncompliant with requirements, the TMD has the authority to remove them from trauma services and trauma call until the deficiencies are resolved.

E. TRAUMA RESPONSE/ACTIVATION

GSMC has a multilevel response, involving three levels. The EMS, ED physician, ED nurse, and trauma surgeon can activate the trauma team.

The statistics for each level of response are tabulated below.

<table>
<thead>
<tr>
<th>Level</th>
<th>Number</th>
<th>Response (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Highest</td>
<td>111</td>
<td>4</td>
</tr>
<tr>
<td>Intermediate</td>
<td>660</td>
<td>25</td>
</tr>
<tr>
<td>Lowest</td>
<td>1,893</td>
<td>71</td>
</tr>
<tr>
<td>Total</td>
<td>2,664</td>
<td>100</td>
</tr>
<tr>
<td>Direct Admits</td>
<td>0</td>
<td></td>
</tr>
</tbody>
</table>

All Category I activations require that the trauma surgeon be present within 15 minutes of activation. All trauma patients admitted to the ICU must be seen in the ED by the admitting surgeon.
The highest level of activation is instituted via group pager, telephone page. The criteria for activation of each level are clearly defined by the trauma center and continuously evaluated by the PIPS program, and include the six minimum criteria of the Committee on Trauma for the highest level of activation. The trauma surgeon is present in the ED on patient arrival, or within 15 minutes of notification, for the highest level of activation 93% of the time. The compliance of the surgeon's presence in the ED for the highest level of activation is confirmed or monitored by PIPS.

F. TRAUMA/HOSPITAL STATISTICAL DATA

The personnel on the trauma team for each level of activation include the following.

<table>
<thead>
<tr>
<th>Responder</th>
<th>Activation Level</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Highest</td>
</tr>
<tr>
<td>ED Physician</td>
<td>X</td>
</tr>
<tr>
<td>Trauma Surgeon</td>
<td>X</td>
</tr>
<tr>
<td>Trauma Nurses</td>
<td>X</td>
</tr>
<tr>
<td>ED Charge Nurse</td>
<td>X</td>
</tr>
<tr>
<td>Radiology Tech</td>
<td>X</td>
</tr>
<tr>
<td>House Supervisor/Rapid Response</td>
<td>X</td>
</tr>
<tr>
<td>Chaplain</td>
<td>X</td>
</tr>
<tr>
<td>CT Scan</td>
<td>X</td>
</tr>
<tr>
<td>Anesthesia</td>
<td>X</td>
</tr>
<tr>
<td>OR</td>
<td>X</td>
</tr>
<tr>
<td>Blood Bank</td>
<td>X</td>
</tr>
</tbody>
</table>

The ED activity and trauma demographics are summarized below.

| Total ED Visits          | 81,495 |
| Trauma ED Visits        | 9,708  |
| Blunt trauma            | 90%    |
| Penetrating trauma      | 8%     |
| Burns                   | 2%     |

The trauma-related ED activity led to the following trauma admissions.

<table>
<thead>
<tr>
<th>Service</th>
<th>Number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>203</td>
</tr>
<tr>
<td>Orthopaedic</td>
<td>405</td>
</tr>
<tr>
<td>Neurosurgical</td>
<td>65</td>
</tr>
<tr>
<td>Other Surgical</td>
<td>26</td>
</tr>
<tr>
<td>Burn</td>
<td>7</td>
</tr>
<tr>
<td>Non-Surgical</td>
<td>214</td>
</tr>
<tr>
<td>Total</td>
<td>913</td>
</tr>
</tbody>
</table>

The disposition of trauma admissions from the ED is shown below.

<table>
<thead>
<tr>
<th>Disposition</th>
<th>Number</th>
<th>Admitted to Trauma Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>ED to OR</td>
<td>175</td>
<td>171</td>
</tr>
<tr>
<td>ED to ICU</td>
<td>90</td>
<td>77</td>
</tr>
<tr>
<td>ED to Floor/Ward</td>
<td>586</td>
<td>412</td>
</tr>
<tr>
<td>Total</td>
<td>851</td>
<td>660</td>
</tr>
</tbody>
</table>
The ISS and percent mortality are as follows.

<table>
<thead>
<tr>
<th>ISS</th>
<th>Trauma Admissions</th>
<th>Deaths</th>
<th>Mortality (%)</th>
<th>Admitted to Trauma Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>592</td>
<td>12</td>
<td>2</td>
<td>405</td>
</tr>
<tr>
<td>10-15</td>
<td>120</td>
<td>3</td>
<td>3</td>
<td>90</td>
</tr>
<tr>
<td>16-24</td>
<td>159</td>
<td>3</td>
<td>2</td>
<td>115</td>
</tr>
<tr>
<td>&gt;25</td>
<td>124</td>
<td>28</td>
<td>23</td>
<td>89</td>
</tr>
<tr>
<td>Total</td>
<td>995</td>
<td>46</td>
<td>5</td>
<td>699</td>
</tr>
</tbody>
</table>

The differences in the totals of the above three tables are due to admission to non-surgical services or surgical non-trauma services (mostly orthopaedics).

The number of trauma transfers is as follows.

<table>
<thead>
<tr>
<th>Transfers</th>
<th>Air</th>
<th>Ground</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Transfers In</td>
<td>2</td>
<td>120</td>
<td>122</td>
</tr>
<tr>
<td>Transfers Out</td>
<td>12</td>
<td>53</td>
<td>65</td>
</tr>
</tbody>
</table>

A mechanism for direct physician-to-physician contact is present for arranging patient transfer. The decision to transfer an injured patient to a specialty care facility in an acute situation is based solely on the needs of the patient.

G. TRAUMA BYPASS

GSMC has a bypass protocol, and during the reporting year was on bypass twice for a total of 11.15 hours. The trauma surgeon is involved in the development and decisions of the bypass protocol.

H. NEUROSURGERY

Dr. Narasimha Jatavallabhula, the neurosurgical liaison to the trauma program, graduated from Rangaraya Medical College in 1993, and completed his residency training at Penn State University in 2011. Dr. Jatavallabhula is board eligible. He is a member of the American Association of Neurological Surgery and the Congress of Neurological Surgery. He has adequate trauma CME over the past 3 years.

Including Dr. Jatavallabhula, there are three board-certified neurosurgeons on the call panel. Trauma-related CME or internal educational process (IEP) over the past 3 years is adequate for the neurosurgeons on the call panel.

While on call, the neurosurgeon is dedicated to the hospital. Neurotrauma care is promptly and continuously available for severe traumatic brain injury and spinal cord injury, and for less severe head and spine injuries when necessary. An attending neurosurgeon is promptly available to the hospital's trauma service when neurosurgical consultation is requested. During the reporting year, the neurosurgeons performed 16 emergency craniotomies within 24 hours of admission. Qualified neurosurgeons are regularly involved in the care of head and spinal cord injured patients and are credentialed by the hospital with general neurosurgical privileges. There is not an on-call alternate neurosurgical backup system since the neurotrauma volume is low less than 25 emergent craniotomies within 24 hours per year). All neurosurgical transfers/diversions are monitored in the PIPS program and convincingly demonstrate appropriate care in the receiving institution. However, the reviewers determined that the neurosurgical service was inadequately involved with the performance improvement program. There is not a neurosurgical residency program at this institution.
I. ORTHOPAEDIC SURGERY

Dr. Brandon Tinkler, the orthopaedic liaison to the trauma program, graduated from University of Texas San Antonio in 2004, and completed his residency training there in 2009. Dr. Brandon Tinkler is board certified (2012). He is a member of the American Academy of Orthopaedic Surgery, has adequate external trauma CME over the past 3 years, and completed fellowship training in trauma orthopaedics including the operative management of complex pelvic and acetabular fractures.

Including Dr. Tinkler, there are six board-certified/eligible orthopaedic surgeons on the call panel at GSMC. Trauma-related CME or IEP participation over the past 3 years is adequate for orthopaedic surgeons on the call panel. Dr. Tinkler has initiated a monthly orthopaedic journal club which includes review of orthopaedic trauma related articles.

During the reporting year, 379 operative cases were done within 24 hours of admission by the orthopaedic service. Also during the reporting year, there were 15 operative pelvis and acetabular fracture cases performed at this institution. There is one orthopaedic surgeon (Dr. Tinkler) who has completed at least 1-year orthopaedic trauma fellowship involving operative care of fractures. There is not an orthopaedic surgery residency program here.

An orthopaedic team member is promptly available in the trauma resuscitation area when consulted by the surgical trauma team leader for multiply injured patients. Orthopaedic team members have dedicated call at this institution. The design of the backup call system is the responsibility of the orthopaedic trauma liaison and has been approved by the TMD.

The trauma center provides sufficient resources including instruments, equipment, and personnel for modern musculoskeletal trauma care, with readily available operating rooms (ORs) for trauma procedures. Physical/occupational therapists and rehabilitation specialists are involved in the acute and rehabilitation phases of care. Operating rooms are promptly available to allow for emergency operations on musculoskeletal injuries, such as open fracture debridement/stabilization and compartment decompression. There is a mechanism to ensure OR availability without undue delay for patients with semi-urgent orthopaedic injuries. The PIPS process reviews the appropriateness of the decision to transfer or retain major orthopaedic trauma.

V. HOSPITAL FACILITIES

A. EMERGENCY DEPARTMENT

The ED provided care to over 80,000 patients in 2013. Trauma related care involved approximately 14 percent of those patients. The ED contains one trauma room with two bays. The trauma room is equipped with heating lights, Bair huggers, a level 1 fluid/blood warmer, and pediatric medications and chest tubes. There is a portable x-ray machine with a four-rack digital x-ray processor. The helipad is just outside the ED entrance. The EMS unloading area has 10 docking sites, including six under roof and four open to air. No heating lights exist in the covered six-bay area. The trauma room is located several feet from the EMS entrance. A 16-slice CT scan is located in the ED. An ultrasound machine is dedicated to the trauma room and FAST is done by the emergency physicians. Two angiography suites are in radiology adjacent to the ED. An MRI is located in the outpatient building next to the hospital. The transport time for the patient to MRI is about 5 minutes. There is no separate area for pediatric trauma care.

The trauma flow sheet is part of the EMR. It is particularly good for documenting activation and response times. However, it is not ideal for tracking I&O or documenting extended care in the ED.
The ED has a designated emergency physician director supported by an appropriate number of additional physicians to ensure care for injured patients. Dr. Gregory Payne, the emergency medicine liaison to the trauma program and head of the ED, graduated from University of Texas Southwestern in 1992, and completed his residency at University of New Mexico School of Medicine in 1998. He is board certified and has taken ATLS in the past. He has the required CME. He or an alternate emergency physician is available to the TMD for PI program issues that occur in the ED.

Including Dr. Payne, there are 30 board-certified/eligible emergency physicians who treat trauma patients. Trauma-related CME or IEP over the past 3 years is adequate for the emergency medicine physicians on the call panel. Emergency physicians on the call panel are regularly involved in the care of injured patients. All of the emergency physicians have successfully completed the ATLS course at least once. The roles of the emergency physicians and trauma surgeons are well defined, agreed upon, and approved by the director of the trauma services. ED physicians do not leave the department to cover emergencies in other parts of the hospital. There is not an emergency medicine residency at GSMC.

Nurses providing care to the Category III trauma patients are required to have successfully completed hospital and nursing orientation, as well as preceptor directed orientation in the ED. All RNs must complete basic competencies and have certification in ACLS, TNCC, and ENPC/PALS within 1 year of hire. Nurses providing care to Category I and II trauma patients must have completed orientation as described above plus a minimum of 1 year experience in the ED. In addition, all nurses seeking competency in caring for these patients must demonstrate completion of all required ED competencies; must have passed the written exam with a minimum passing score of 80; must have worked 10 shifts of at least 8 hours with a preceptor; and must have successfully completed a practical with their preceptor for eight or nine procedures.

Nurses in the department are required to have trauma-related continuing education. The new simulation center is utilized for TNCC and ENPC courses; disaster preparedness and response (annually and with drills); rapid infuser in-services; ACLS; TNCC; and PALS. Assessment and documentation for the trauma patient is offered in ED orientation. Education on activation criteria for trauma patients is offered in ED orientation and as needed. An ED skills lab (annually), chest tube set-up and insertion training, arterial pressure monitoring training, central line set-up and insertion training, and hemodynamic monitoring training are also provided. Nurses in the department have an average experience of 9 years. There is an annual turnover rate of 15%. Extra certifications for ED nursing staff includes 84% TNCC, 24% CEN, 62% PALS, 86% ACLS, 4% CCRN, and 21% ENPC.

**B. RADIOLOGY**

There is a radiologist appointed as liaison to the trauma program. Radiology participates in the trauma PIPS program by involvement in protocol development and trend analyses that relate to diagnostic imaging. Radiologists are promptly available, in person or by teleradiology, when requested, for the interpretation of radiographs, performance of complex imaging studies, and interventional procedures.

Radiologists are not in-house 24/7. GSMC operates on a Picture Archival Computer System (PACS). A radiologist is on-site until 2300, 7 days per week. After 2300, a teleradiology service is available for interpretations; however, the "on-call" radiologist is available to respond to critical/emergent needs. The radiologist on call is also available to respond to on-site needs in mass casualty situations and at the discretion of the trauma surgeon. Diagnostic information is communicated in a written form and in a timely manner. Critical information is verbally communicated to the trauma team. Final reports accurately reflect communications, including changes between preliminary and final interpretations. Changes in interpretations are monitored...
through the PIPS program. When an error is identified, the corrective policy is initiated by imaging services. A PI system is in place to reconcile discrepancies. The interpreting radiologist notifies the attending physician via the telephone of the error and documents the notification. Discrepancies are also reviewed at the trauma PI committee meetings for loop closure.

In the department, there is resuscitation equipment for both adult and pediatric patients. There are policies designed to ensure that trauma patients who may require resuscitation and monitoring are accompanied by appropriately trained providers during transportations to and while in the radiology department. Conventional radiography and CT are available 24 hours per day. There is an in-house CT radiographer 24 hours per day.

Conventional catheter angiography and sonography are available 24 hours per day. After hours, response time for angiography and MRI is 30 minutes. However, these response times are not tracked and reported.

C. OPERATING SUITE

The 14-bed operating suite is located one floor directly above the ED and is accessible by a dedicated elevator. The OR is adequately staffed and readily available. The OR personnel are in-house 24/7 to start an operation. When a second OR is needed, the backup call team is notified on arrival of all Category I trauma. During the day, the schedule facilitates OR availability and scheduled cases are "bumped" if necessary. However, there is not a specific room identified at any given time as the trauma room.

The PIPS program evaluates OR availability and delays when an on-call team is used. There is a mechanism for documenting the trauma surgeon's presence in the OR. The OR has the essential equipment, including that which is required for craniotomy.

The anesthesia liaison to the trauma program, Dr. Benji Burke, graduated from Louisiana State University in 1987. He completed his training at the University of Arkansas in 1991 and was certified in 1998. There are 18 anesthesiologists on staff and two are on backup call during the off-hours. All of the anesthesiologists taking call have successfully completed an anesthesia residency program. GSMC utilizes CRNAs, and they are involved in the care of the trauma patient. One CRNA provides in-house call and one is on backup.

Anesthesiology services are promptly available for emergency operations and for airway problems. The availability of the anesthesia services and the absence of delays in airway control or operations are documented by the hospital PIPS process. Anesthesia services are available 24 hours a day and present for all operations.

D. POSTANESTHESIA CARE UNIT (PACU)

The PACU contains 13 beds. There is adequate staffing without delays, and all required equipment is present. The PACU occasionally serves as an overflow for the ICU.

The credentialing requirements for the PACU nurses who care for trauma patients include completion of all basic nursing and hospital orientation requirements. Competency in the care of the postoperative recovery patient and airway management is also required. All nurses are required to have certification in ACLS and PALS within 6 months of hiring. Extra certification for the PACU staff includes 73% TNCC, 100% PALS, 100% ACLS, 13% CCRN, and 6% CPAN. The reviewers felt the commitment of the nursing staff to attain TNCC certification was commendable.
E. ICU

The ICU consists of 33 ICU beds, of which 11 are surgical beds. Dr. Chastain, a cardiothoracic surgeon, is the surgical director of the ICU who is responsible for setting policies and administration related to trauma ICU patients. He is not board certified in surgical critical care but he has appropriate training in residency and experience for the role of surgical director. There are four pulmonologists and a PGY-3 medical resident who are onsite during regular working hours and during off shift, the PGY-3 medical resident is on site. Intensivists are available 24 hours a day to assist the trauma surgeon in meeting the needs of the critically injured trauma patient.

The trauma surgeon remains in charge of patients in the ICU. The immediate response for life-threatening injuries in the ICU is provided by trauma surgeons who are on call 24 hours a day and critical care rounds are conducted by individual trauma attendings. Emergent airway issues and ventilator management is addressed by the critical care medical staff. Subspecialty coverage is available 24 hours a day. Anesthesia is onsite 24 hours a day to respond to immediate resuscitation needs. Qualities of care issues in the trauma patient are resolved through the trauma systems committee and/or the trauma multidisciplinary peer committee with SCC representative as an ad-hoc member as appropriate. The TMD participates in the SICU quality committee. There are no interdisciplinary critical care rounds in place for issue identification and continuum of care management of the critically ill trauma patient. The trauma surgeon generally is kept informed of all therapeutic and management decisions made by the ICU team and are given the opportunity to concur with those decisions. There are no trauma critical care guidelines in place.

Qualified nurses are available 24 hours per day to provide care in the ICU. The credentialing requirements for nurses working in ICU include completion of critical care orientation and certification in ACLS. TNCC and PALS are desirable within 1 year of hire and certification in CCRN is strongly encouraged.

Nurses in the unit average 8.5 years of experience, with an annual turnover rate of 11%. The unit maintains a 1:1 or 1:2 nurse-to-patient ratio staffing pattern. Extra certification for ICU nurses includes 84% TNCC, 50% PALS, 100% ACLS, and 21% CCRN. The ICU has the necessary equipment to monitor and resuscitate patients including intracranial pressure monitoring equipment.

F. BLOOD BANK

The source of blood products are the regional blood banks. The primary source is Carter Blood Care in Tyler, Texas. A secondary source is the Lifeshare Blood Center in Shreveport, Louisiana.

Two units of O-negative blood are taken to the ED in a cooler by the blood bank technician for every Category I activation. There is a massive transfusion protocol (MTP), and uncrossmatched blood is immediately available.

There is a massive transfusion protocol and uncrossmatched blood is immediately available. A massive transfusion is in place with appropriate ratios. Type-specific LRBCs and FFP can be sent if a blood bank sample has been received and a current blood type has been performed.

The average turnaround time for type-specific blood is 20 minutes, and for full crossmatch, 60 minutes. The blood bank has an adequate supply of red blood cells, fresh frozen plasma, platelets, cryoprecipitate, and appropriate coagulation factors to meet the needs of injured patients.
VI. SPECIALTY SERVICES
A. PEDIATRIC TRAUMA

The trauma program defines an injured pediatric patient as younger than 15 years old. The number of pediatric trauma admissions to the specific services during the reporting year is summarized below.

<table>
<thead>
<tr>
<th>Service</th>
<th>Number of Admissions</th>
</tr>
</thead>
<tbody>
<tr>
<td>Trauma</td>
<td>5</td>
</tr>
<tr>
<td>Orthopaedic</td>
<td>28</td>
</tr>
<tr>
<td>Neurosurgical</td>
<td>1</td>
</tr>
<tr>
<td>Other Surgical</td>
<td>5</td>
</tr>
<tr>
<td>Non-Surgical</td>
<td>0</td>
</tr>
<tr>
<td>Total Trauma Admissions</td>
<td>39</td>
</tr>
</tbody>
</table>

The ISS and mortality rates for these patients are shown below.

<table>
<thead>
<tr>
<th>ISS Category</th>
<th>Trauma Admissions</th>
<th>Deaths</th>
<th>Mortality (%)</th>
<th>Admitted to Trauma/Pediatric Surgery</th>
<th>Admitted to Non-Surgical</th>
</tr>
</thead>
<tbody>
<tr>
<td>0-9</td>
<td>30</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
<tr>
<td>10-15</td>
<td>3</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>16-24</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>&gt;25</td>
<td>2</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Total</td>
<td>39</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>0</td>
</tr>
</tbody>
</table>

Care of the injured pediatric patient is reviewed through the PIPS program. There is not a separate pediatric trauma team.

B. REHABILITATION SERVICES

Drs. Slone and Earnest are the co-directors of the rehabilitation program, and are board certified in internal medicine. Rehabilitation begins in the acute care setting, including the ICUs, based on the patients’ medical diagnosis, physical and cognitive condition, and the physician's orders. The multidisciplinary team includes physical therapists, occupational therapists, and speech therapists that are trained in the care of patients with neurological deficits and other functional limitations. There is an inpatient rehabilitation unit, with 26 inpatient beds which is CARF approved. The system used to measure rehabilitation is FIM.

C. BURN PATIENTS

During the reporting year, the hospital admitted seven burn patients. There is not a separate burn team. The hospital is not a verified burn center. No patients were transferred in, and 17 were transferred out. The hospital has transfer arrangements for burn patients.

D. VERTEBRAL COLUMN INJURIES

During the reporting year, the hospital admitted 123 patients with spinal column injuries, and these included nine with neurological deficits. Nineteen were transferred in, while seven were transferred out. There are transfer agreements in place. The hospital has a neurosurgeon trained in the management of spinal column injuries.
E. ORGAN PROCUREMENT

GSMC has an organ procurement program. This program led to 46 trauma referrals during the reporting year, which resulted in nine donors. The trauma center has an established relationship with a recognized organ procurement organization (OPO). There are written policies for triggering notification of the OPO. The PIPS process reviews the organ donation rate. There are written protocols for declaration of brain death.

F. SOCIAL SERVICES

Social workers are available to all trauma patients and a case manager is assigned to every trauma patient. The case manager assesses each trauma patient's condition and consults appropriate disciplines and/or providers to ensure care is provided timely. The trauma program does not have a social worker dedicated to each injured patient. However, there is a case manager assigned to each trauma patient and the social work team is available 0800 to 1700 daily, and a call system exists to provide 24/7 coverage when needed.

All social workers have been trained in crisis intervention management. In-house chaplain services are also available during the day and on-call coverage after hours as well as support from area churches of all denominations. Texas provides local mental health authorities to assist with mental health cases.

G. DISASTER PLANNING AND MANAGEMENT

The trauma center has a hospital disaster plan described in the hospital disaster manual. The hospital meets the disaster-related requirements of the Joint Commission. A trauma surgeon is a member of the hospital's disaster committee. The hospital is able to respond to radioactive, chemical, biological hazardous materials.

H. OTHER SURGICAL SPECIALISTS AND MEDICAL CONSULTANTS

The trauma center has the required surgical specialists. Specialists from internal medicine and pulmonary medicine are available on the medical staff. Specialty consultations for problems related to internal medicine, cardiology, gastroenterology, urology, and infectious disease are available.

VII. PERFORMANCE IMPROVEMENT AND PATIENT SAFETY (PIPS)

A. PIPS

The trauma center demonstrates an evolving PIPS program structure that is evolving for the trauma population. The trauma center is able to separately identify the trauma patient population for review. There is a PI plan in place that has been reviewed by the quality departments and interfaces with hospital quality’s plan and structure. The PIPS program is supported by a reliable method of data collection that consistently gathers valid and objective information necessary to identify opportunities for improvement. The process of analysis includes multidisciplinary review, occurs monthly to meet the needs of the program. Corrective mitigation strategies documentation was inconsistent and intermittently documented. Loop closure measures and resolution documentation was also ill-defined. There is identification of specific system problems. The trauma program has adequate administrative support and defined lines of authority that ensure comprehensive evaluation of all aspects of trauma care. The trauma program is empowered to address issues that involve multiple disciplines. This program is under the direction of the TMD and TPM as delegated by hospital bylaws. The information used to drive this program is garnered from the trauma registry and is collected both concurrently and retrospectively. Identified problem trends undergo multidisciplinary peer review by the trauma
peer review committee. Issue identification and PI management includes tracking forms with audit filters, chart audits and daily monitoring to identify any trends of concern. Multidisciplinary team weekly trauma rounds are currently not in place. Issues undergo varied levels of review. However, there is inconsistent documentation of level 1 and level 2 reviews and mitigation steps are not consistently documented.

Overall, the reviewers judged the PI to be in an entry level phase with the PI structure and process in place. The focus of the program is process assessment and analysis, as opposed to being outcomes focused. Issue identification processes are in place. However, consistent physician rounding, multidisciplinary rounds and trauma guidelines would enhance the capture of events. Peer review committee minutes were limited and demonstrated minimal discussion of care concerns. A critical case review process to capture all opportunities for improvement was not routinely demonstrated.

Patient care problems were intermittently associated with mitigation and event resolution. There was inconsistent documentation. The program demonstrated identification and resolution of specific system problems. There appears to be a need for a multi-level process to ensure patient care problems are captured. This should then be accompanied by clearly documented mitigation strategies to allow adequate loop closure.

B. TRAUMA REGISTRY

The trauma program utilizes the Trauma One registry program. Trauma registry data is collected and analyzed with data entry completed within 2 months of discharge in at least 80% of the patients. The selection criterion for data entry is based on state and regional requirements. Inclusion criterion includes ICD-9 codes 800.0-959.9 (excluding 905-909, 910-924, and 930-939) and trauma related cardiac arrests. The registrar was able to demonstrate rapid facility with data retrieval. The hospital has state and regional affiliation for the trauma registry. The registry data is submitted to the National Trauma Data Bank (NTDB) and is benchmarked at the regional level through the RAC. The trauma registry is supportive of the PIPS program, but it is not utilized to its full potential in the application of identifying opportunities for improvement in the area of data analysis and proof of event resolutions. The trauma program ensures that trauma registry confidentiality measures are in place with strategies for monitoring data validity for the trauma registry.

C. TRAUMA DEATH AUDITS

During the reporting year the hospital had 46 deaths, including 11 dead on arrival, six deaths in the ED, and 29 in-hospital deaths. There was one death classified as unanticipated mortality with an opportunity for improvement, two anticipated mortalities with an opportunity for improvement, and 43 mortalities without opportunity for improvement. The autopsy rate was 28%. Autopsy findings are reported to the trauma committee and reviewed by the TMD, trauma coordinator, and risk management. All autopsy reports are placed in the medical record. Any incongruent findings are referred to the trauma PI committee.

D. MULTIDISCIPLINARY TRAUMA COMMITTEE

After review of data and the PIPS programs review process, less than 10% of the injured patients were admitted to non-surgical services, with none during the reporting year. There is appropriate systematic tracking/trending and monitoring review practices in place with TMD oversight, which was demonstrated through the PIPS process. There is a multidisciplinary peer review committee chaired by the TMD with participation from general surgery, orthopaedic, neurosurgery, emergency medicine, radiology, and anesthesia. This committee meets monthly with adequate attendance of greater than 50% by each of the core group of trauma surgeons, all of
the liaison representatives and the TMD. There is a trauma program operational process PI committee (TOPPIC). This committee addresses the trauma program operational issues. Currently the TMD, trauma surgeons, and peer liaisons do not consistently attend the TOPPIC meetings. There is documentation reflecting the review of operational issues and, when appropriate, the analysis and proposed corrective actions. Nursing PI issues are reviewed by the trauma PI program.

E. PROTOCOL MANUAL, EVIDENCE-BASED GUIDELINES AND BENCHMARKS

The trauma program has a protocol manual for trauma. During the past 3 years, the trauma program has instituted limited trauma physician specific evidence-based trauma management guidelines. Examples include the MTP and an institutional non-trauma specific DVT prophylaxis guideline. These guidelines are not currently incorporated into the PI program for care analysis.

The trauma program benchmarks their trauma care internally in the PI program. The registry data is supportive of the PIPS program however, is not utilized to its full potential for data analysis to support event resolutions. Patient outcomes are monitored for trauma and other surgical patients through a software system called "Care Chex" a national ranking system. This system allows GSMC to evaluate complications, mortality, cost, length of stay, and patient satisfaction metrics and is risk-adjusted based on patient characteristics. The data can be sorted by trauma service line specific and physician specific to be benchmarked nationally, regionally or with internal peers. NTDB trauma data is also benchmarked within the regional trauma advisory council (RTAC).

F. RECOMMENDATIONS FOR PIPS PROGRAM

Deficiencies or weaknesses in the PIPS process found during the review could be corrected or improved by the following.

- Incorporate and utilize internal benchmarking and data analysis to drive judgment rationales.
- Expand discussion, actions and outcome measures in trauma peer review and system minutes to support and enhance clinical rationales and decisions that are brought forward to the committee.
- Strive to incorporate trauma registry PI software capabilities and centralize an electronic process for proof of corrective actions in the trauma registry at all levels of review in the patient electronic file for trending and tracking of care issues.
- Develop and implement evidence-based guidelines for consensus of optimal patient care. These could include C-spine guidelines, TBI management in the ICU, unstable pelvic management, antibiotic therapy guidelines, chest tube management guidelines, anticoagulation reversal protocol, and elder guidelines.
- Incorporate a process to evaluate clinical practice guidelines/protocols and report via the PI process.
- Expand the attendance of the TOPPIC committee to include physicians.
- Develop a tertiary survey tool and utilization process.
- Institute a minimum of weekly multidisciplinary trauma rounds.
- Expand use of registry data in the performance improvement program.

VIII. EDUCATIONAL ACTIVITIES, OUTREACH PROGRAMS, AND PREVENTION

In this teaching facility, the requirements of the internal medicine Residency Review Committee are met. The residents do not participate directly in the care of the injured patient unless they are working with a consultant.
Educational offerings for physicians, nurses and prehospital providers include the following:

- **Physicians**: Monthly journal club for the trauma surgeons with CME.
- **Nurses**: TNCC, ENPC, ED new nurse orientation for activation criteria and documentation, and TOPIC
- **Prehospital providers**: PHTLS, TNCC, and AMLS.

The trauma center is engaged in public and professional education. The hospital has a trauma injury prevention program. Doug Bloyd is the injury prevention coordinator and has a demonstrated job description and salary support. The trauma center demonstrates the presence of limited prevention activities that center on priorities based on local data.

The trauma center demonstrates collaboration with or participation in national, regional, or state programs. Examples of injury prevention include the Texting Can Wait program and ImPACT.

Hospital outreach efforts include follow-up letters that are sent to facilities regarding patients who are either transferred to GSMC or transferred out of GSMC to another facility. These letters provide information regarding evaluation of care and outcomes.

The trauma center has a mechanism to identify patients who are problem drinkers. The screening instrument used is the blood alcohol concentration.

**IX. RESEARCH**

GSMC does not have a trauma research program.

**X. CHART REVIEW PROCESS**

The requested charts were fully provided by the trauma team. These charts were appropriately subdivided by the requested categories, and the trauma team members were helpful in the chart review process. The charts were more than 90% complete. The chart review process demonstrated that the quality of patient care was fair. The surgical response times to the ED were good for level 1 activations. The response time for level 2 activations is 24 hours and is left to the trauma surgeons’ judgment.

**XI. EXIT INTERVIEW**

The exit interview was attended by many of the same members who were present at the prereview dinner. The Verification, Review, & Consultation statement was read verbatim. The summary was then presented and various aspects of the review were discussed by the site visitors and the trauma team members. There were no disagreements with the summary report expressed by the trauma team members.
Chart Reviews

1  **Unanticipated Mortality with OFI**  
**ISS 9**
A 59-year-old female was the restrained driver of a frontal impact with air bags deployed crash. She was hemodynamically stable in the prehospital setting and on arrival with a GCS score of 15. The Trauma surgeon is not documented as arriving for this level 2 activation. Admission CT scan revealed small amount of free fluid in the pelvis without a solid organ injury. She was admitted to a floor bed. Next day patient went into PEA, was resuscitated and then taken to the OR for a small bowel injury. Postoperatively, she went into florid multi-organ failure and expired.

**PI:** Reviewed for death and delayed laparotomy. The minutes reflect that the group concluded the MOF was related to the PEA and not due to the delayed diagnosis of bowel injury with subsequent secondary peritonitis. This case was also referred to the department of surgery M&M. The outcome from this review was that the admitting trauma surgeon was placed in a focused professional practice evaluation (FPPE) for 6 months. The case was also referred to the medical executive committee and they supported the FPPE.

**Reviewer’s Comments:** This case might have been a sentinel event due to the delayed diagnosis. I feel the arrest was due to hypovolemia related to peritonitis. The patient was on the floor with a maintenance IV running at 75cc/hr for 24 hours prior to the arrest. The PI program was effective in escalating this case to the hospital wide PI program. The surgeon should have also been reviewed for not seeing this Level II activation for 18 hours after admission. The trauma program does not have an established time for the trauma surgeon to respond to level 2 activations.

2  **Anticipated Mortality without OFI**  
**ISS 5**
An 83-year-old woman fell at home and presented to the ED complaining of pain in the head area. Co-morbidities included atrial fibrillation, hypertension and seizure disorder. She was on Coumadin. CT scan revealed a Type 2 odontoid fracture. This lady was admitted to the medical service with neurosurgery as a consultant. Here INR was normalized with FFP and she the fracture was fused. On postoperative day 1, she was had a left hemiparesis. CT scan confirmed a left cerebellar and occipital lobe infarct. Family elected for comfort care and extubation and the patient expired.

**PI:** There were no care issues identified

**Reviewer’s Comments:** I reviewed the anesthesia record. The patient’s blood pressure on entry into the OR was 160 systolic. During anesthesia, it ranged between 80-120 systolic. Suspect this contributed to the infarction. Discussed with the TMD and he felt that her care was good despite reviewing the anesthesia record with him.

3  **Anticipated death without OFI**  
**ISS 3**
A 33-year-old male was a pedestrian struck by a car at a high rate of speed. He was intubated in the field by EMS and CPR initiated. Scene time was 6 minutes and transport time was 6 minutes. Patient was admitted to the trauma bay 3 minutes after arrival of EMS. ACLS was continued. Trauma surgeon arrived 8 minutes after patient was admitted. Patient was pronounced.

**PI:** Care was felt to be appropriate.

**Reviewer’s Comments:** Good aggressive care and agree with PI.

4  **Anticipated Mortality without OFI**  
**ISS 34**
This young man was shot multiple times to chest and abdomen. He was intubated in the field and CPR was initiated and continued for 25 minutes prior to arrival to the trauma center. ON arrival, FAST revealed no cardiac activity and he was pronounced. Autopsy report revealed the following injuries: left lung laceration, penetrating wound of the diaphragm, spleen, left kidney and pancreas with 1.4 liter of hemoperitoneum.

**PI:** There were no patient care issues identified.

**Reviewer’s Comments:** Agree
5 Spleen/Liver ISS 41
This 24-year-old man was an unrestrained driver of a car that collided head on with another car. Airbag deployed. He was hypotensive on arrival which normalized after a 1 liter bolus. Injuries included: left rib fractures, grade IV spleen laceration, left scapular fracture, left femur fracture and left ankle fracture. After stabilization of the femur fracture, the hematocrit was slowly decreasing. The surgeon elected to embolize the spleen prior to initiating VTE prophylaxis. ASA and Xarelto were begun for VTE prophylaxis. The hemoglobin stabilized. One week after admission, was transferred to rehab. Readmitted 3 weeks after discharge for change in mental status and found to have a subdural hematoma which required surgical evacuation.

PI: Recognized that Xarelto contributed to SDH. However, there was no discussion about evidence to support the use of Xarelto for VTE prophylaxis.

Reviewer’s Comments: I discussed with the TMD that this use of xarelto was not recognized as a violation of the VTE protocol used by the trauma service. There has not been any practice change since this case. I feel the trauma program should have looked at this as an opportunity to improve care and discontinue the use of xarelto for VTE prophylaxis.

6 Spleen/Liver ISS 34
This 28-year-old female was a restrained passenger with hypotension and a GCS score of 9 at the scene. Prolonged extrication with airbags deployed. A level 1 activation was announced. Trauma surgeon was present prior to patient’s arrival. She was hypotensive on arrival and crystalloid resuscitation was initiated. FAST was negative. Twenty minutes after arrival, patient was intubated and taken to CT scan while hypotensive. Injuries included; left 1-8 rib fractures on the left, Grade II-II liver laceration, grade I splenic laceration, pelvic fracture. Taken to OR for splenectomy and repair of mesenteric lacerations. Found to have 1 liter of blood. Orthopaedics were then stabilized a few days later. She was discharge home 12 days after admission.

PI: No issues were identified

Reviewer’s Comments: I discussed with the TMD who was the treating surgeon that hypotensive patients should not go from the ED to radiology. Perhaps a repeat FAST exam in this unstable patient would have revealed an increased hemoperitoneum and been adequate justification to go directly to the OR rather than CT scan. We also discussed the possible role for splenorrhaphy rather than –ectomy for a Grade I laceration.

7 Epidural/Subdural ISS 25
This 82-year-old woman was a ground-level fall and presented to the ED as a level 4 activation for “heavy tongue.” CT scan revealed a small subdural hematoma (7mm thick without midline shift). She was admitted to the medical service and neurosurgery was consulted for 24 hours before being discharged.

PI: No patient care issues.

Reviewer’s Comments: Agree with PI

8 Epidural/Subdural ISS 21
This 20-year-old man presented after a fall and was found to have an epidural hematoma. Neurosurgery evacuated it with 90 minutes of admission. He was discharged home 48 hours after admission.

PI: No issues identified

Reviewer’s Comments: Agree with PI. Excellent, timely care.

9 ISS > 25 with Survival ISS 34
A 62-year-old woman was trampled by horses. She was awake and coherent when the EMS arrived. She was reportedly unconscious for 15-20 minutes. A level 2 activation was announced. The orthopaedic surgeon was present for the patient’s arrival. She was hemodynamically stable. CT scan was completed more than 1 hour after admission. Injuries included: left 1-5 rib fractures,
left clavicle fracture, small (1-2mm) pneumothorax, orbital blow out fracture, and Grade III open tib-fib fracture. Taken by orthopaedics for open fracture 2 hours after admission. Trauma surgeon evaluated the patient 30 minutes before entering the OR. She required a flap for coverage and was discharged home 15 days after admission.

**PI:** There were no issues identified with care

**Reviewer’s Comments:** The care was good but this patient with multiple injuries should have been seen by the trauma surgeon sooner. The program needs to have a time frame for Level II activations to be seen by the trauma surgeon.

### 10 Thoracic Injury

This is a 19-year-old white male that was shot at close range in the chest with a handgun. The patient was transferred via EMS to an ED of a small hospital. In that ED two large bore peripheral IVs and a femoral triple lumen catheter were placed, the patient was intubated orotracheally and two left sided chest tubes were placed. One unit of blood was given and the patient was transferred via ground ambulance: a second unit of blood was begun during transport. The patient was classified as a level 3 trauma. The trauma surgeon arrived in the ED within 15 minutes of the activation. Two entrance wounds were noted in the left chest with an exit wound in the left scapular area. On arrival the patient had a BP of 142/70, Pulse of 124 and a temp of 96.1. There is no documentation of any action taken to warm and maintain an appropriate temperature for the patient. The drainage from the chest tubes amounted to 660 ccs. The patient was taken to the OR within 60 minutes of arrival. At the time of leaving the ED his BP was 116/64 and pulse 114: no temperature was recorded.

In the OR the patient underwent abdominal laparoscopy and a left diaphragmatic injury was found and repaired: no intraabdominal injuries were noted. Cardiothoracic surgery was consulted and bronchoscopy with toilet broncho-lavage was done. A small amount of blood was found in the left and right bronchi. The endotracheal tube was noted to be in the left main stem bronchus and was repositioned. No cardiothoracic injuries were found. The patient was subsequently admitted to the surgical ICU. The progress notes and discharge summary, both of which are sparse, do not state that any other injuries were identified or indicate that that patient had anything other than a stable course of recovery. The patient was discharged 11 days after admission.

**PI:** There was concern of the need for the placement of two chest tubes as well as that one of the chest tubes may have caused the diaphragmatic injury. On arrival one of the tubes appeared to be kinked. Review of films and CT from the outside hospital indicated acceptable expansion after the placement of the first tube. A letter was sent to the outside hospital requesting clarification regarding the reason for the placement of two chest tubes. No further information is provided regarding resolution of this concern.

**Comments:** There was no evidence of “closing the loop” on the PI process. Also there were missed opportunities for PI on this patient: there is no indication that the patient’s temperature was monitored and appropriate interventions performed; the patient was classified as level 3. This reviewer thinks that the patient was under triaged and meets institutional criteria for a level 1. However, the trauma surgeon arrived within the level one standard; the patient had a left main stem bronchial intubation; and, there was no evidence of screening and intervention for alcohol problems. Furthermore, there were no records regarding the EMS transport to the outside hospital, the care given in the outside hospital or the EMS transport from that hospital.

### 11. Pediatrics (<15)

This is a 3-year-old female that fell approximately 3 feet off of a slide. She had a chief complaint of left elbow pain. She had no other complaints. Vital signs were stable with a GCS of 15. The only abnormality noted was a deformity in the left elbow region. This was not associated with neurovascular compromise. The fracture was not open. An X-ray showed a supracondylar fracture with displacement. The patient was taken to the OR for an ORIF, admitted and discharged two days after admission.

**PI:** The case was not selected for PI
12. Pelvic Injury
This is a 77-year-old white female that was the unrestrained driver of a high speed MVC with air bag deployment. The patient had a history of several medical problems. She was transferred from the scene by helicopter: she was classified as level two, but upgraded to level one on arrival to the ED. On arrival she had BP of 82/50; pule of 68, respirations of 18 and GCS of 15. The trauma surgeon responded within 10 minutes of the activation. On arrival the patient had two large bore IV’s. She was given two units of blood, given fluids and had a negative FAST. Imaging studies revealed a small SAH, R superior and inferior pubic rami fractures, a right sacral alar fracture, a non-displaced type 3 odontoid fracture and fracture of the 5th metacarpal. Within 11 minutes of arrival the patients BP was 177/79, pule 73, respirations 18 and GCS 15. An EKG and lab studies did not indicate any blunt or ischemic cardiac injury. Orthopaedics and neurosurgery were contacted in a timely fashion and a non-operative approach to her orthopaedic and neurological injuries was selected. She was admitted to the surgical ICU. The hospitalist service was consulted to assist in her medical management. She had an uneventful course and was evaluated and treated by occupational/physical Therapy. She was discharged to an inpatient rehabilitation facility.

PI: The case was reviewed because of the trauma classification upgrade. It was concluded that the upgrade was done in a timely fashion. However no information from the helicopter run sheet was discussed relevant to the possibility that the patient was not appropriately classified by the helicopter service.

Comments: This was an extremely efficient, timely, and, well coordinated response to the elderly trauma patient who is unstable and has multiple injuries. However, there was a missed opportunity for PI by not addressing that there was no documentation of screening and brief intervention for alcohol problems. The progress and discharge notes were very sparsely written.

13. Epidural/Subdural Hematoma
This is an 81-year-old male who was transferred from a nursing home by ambulance because of falling and hitting the back of his head and lacerating the occipital scalp region. He had a complicated medical history, including a previous subdural hematoma which was treated non-operatively. He also was on multiple medications including a fentanyl patch. Vital signs were stable with a GCS of 14. There was no classification noted on the trauma flow sheet. A head and neck CT found a five mm subdural hematoma that was markedly smaller than the last follow-up CT for subdural hematoma. The C-spine images were negative. Neurosurgery was consulted: no interventions or further studies were recommended. The laceration was repaired in the ED. The patient was admitted to a medical service with neurosurgical consult. It was ultimately concluded that the five mm subdural hematoma represented his resolving previous hematoma and not a new injury. He was discharged 2 days after admission.

PI: There were no PI issues.

Comments: The ISS score was listed as 16. Given that it was determined it wasn’t a new injury this reviewer thinks the ISS was scored too high.

14. Patient Transferred Out
This is a 7-year-old male that was run over by a golf cart that was traveling approximately 5 miles per hour. The patient had a large full thickness avulsion of the left quadriceps area, an occipital laceration and bruising to the left lateral orbit. The patient was awake and alert at the scene with normal vital signs. The patient was transferred by ground ambulance as a level 2 classification. Vital signs on arrival were 125/86, 84, 22, GCS 15. A 20 cm full thickness avulsion was noted over the left quadriceps area. The trauma surgeon arrived one hour after the patient’s arrival. A chest film, pelvis film and extremity films were done. The patient also had a head and neck CT as well as an abdominal/pelvis CT. Imaging showed a left fronto-parietal skull fracture that was comminuted and depressed. The trauma surgeon arrived approximately one hour after the patient’s arrival. The occipital laceration was repaired and upper leg avulsion area was cleansed,
irrigated, packed and dressed. The patient was transferred to a pediatric hospital approximately 2.5 hours after arrival. The vital signs at that time were 103/55, 75, 20, GCS 15.

**PI:** There were no PI issues identified

**Comment:** None

**15. Transferred Out**

This is a 10-week-old child that was involved in house fire. The mother jumped with the baby in her arms. The baby rolled out of her arms when she landed. The patient was noted to have burns on the face, soot in the mouth and nose and was stridorous, awake and had a strong pulse. An IV was placed in the field and the patient was transferred via ground ambulance with an initial trauma classification of two. On arrival to the ED the patient was retracting and stridorous with a strong rapid pulse, partial thickness burns to the face and a laceration to the occipital scalp. The activation level was upgraded to a level one, and the trauma surgeon was already in the ED at the time of the upgrade. Immediately after arrival the patient was orotracheally intubated via RSI. A CT of the head showed a small SAH. A CXR showed some atelectasis in upper lobes. A CT of the abdomen, pelvis and spine were negative. The occipital laceration was repaired and the burns dressed. The patient remained intubated and stable in the ED and was transferred to a pediatric hospital approximately 5 hours after arrival.

**PI:** PI noted that the patient was under-triaged in the field but did not identify a cause or corrective action plan regarding this.

**Comments:** This was an efficient and timely response by the ED and trauma service to a challenging pediatric case of thermal and blunt trauma. There was insufficient information on the trauma flow sheet regarding ventilator and fluid management while the patient was awaiting transport in the ED.

**16. ISS > 25 with survival**

This is a 24-year-old male who was the restrained driver in a high speed MVC with airbag deployment. Extrication was required. At the scene he was awake and talking and had vital signs of 116/70, 79 and 20. There was an open fracture of the left femur and open fractures of the right tib-fib. Two IVs and high flow oxygen via NRB mask were started. On arrival the patient had vital signs of 177/107, 80, 20 and GCS of 10. The patient became agitated and his RR increased to 40. The classification was upgraded to Class 1, and the trauma surgeon arrived within 18 minutes of the activation. The patient was orotracheally intubated via RSI, and had a FAST which showed questionable fluid. A posterior splint was put on the right leg. A foley catheter showed a bloody return. Imaging studies showed left femur and right tib-fib fractures, a pulmonary contusion and a small liver laceration with a small amount of fluid in the abdomen. Antibiotics were started. Approximately one hour after arrival the patients BP dropped to 94/48 with a pulse of 70. Blood was started on the patient. The patient was taken to the OR for ORIF of orthopaedic injuries approximately one hour later. Vital signs at the time of being transported the OR were 119/59 and pulse 70. Blood and fluids were given during the surgery. The patient was subsequently admitted to the surgical ICU.

The patient was extubated the next day and received further transfusions for his hemorrhage induced anemia. The patient received a total of five units of blood in the ED and in-hospital. No other injuries were identified. The patient was evaluated and treated by occupational/physical therapy and had screening and brief intervention for alcohol problems. Other than the need for blood transfusions, the patient had an unremarkable hospitalization and was discharged five days after admission.

**PI:** The PI process noted that the patient was appropriately upgraded and the surgeon’s response time, 3 minutes longer than the 15 minute requirement, did not adversely impact the patients care.

**Comment:** This reviewer thinks the majority of this patient’s blood loss was due to orthopaedic injuries. There is no mention of the use of a traction splint being applied to the left leg in the field. The transport time was almost an hour. Use of a traction splint would have reduced bleeding from the femur fracture. A traction splint could also have been applied in the ED. The failure of using a traction splint should have been addressed by PI. Although gross blood was obtained from the
foley, no cystographic studies for bladder injury or evaluation for urethral injury were done. This oversight should have been addressed by PI.

17 non-surgical ISS 13 (9)
This is a 76-year-old female who had fallen from same level with an extensive medical history. She was transported via EMS in stable condition and was seen timely by the ED physician, with an ortho and cardiology consult. She was transferred to CT in less than 30 minutes discharged to the unit within an hour. Diagnosis was a femoral neck fracture and was admitted to medicine. She underwent an ORIF 3 days later and discharged in 10 days.
PI: Level 2 review by TMD for non-surgical indicator with no issues identified.
Comments. This case was seen in ED quickly. LOS lengthy appeared to be cardiac management related which may have impacted the LOS. ISS was recalculated to 9 and reviewed with registrar.

18 transfer out ISS 25
This is a 36-year-old male who was severely burned by a space heater and was transported via EMS. He was a level 2 activation with the trauma surgeon present on arrival. Burns were 2 & 3 rd. degree over entire body. He was stabilized and transferred to regional burn center in less than one hour.
PI: Level 1 review and follow up in nursing education for lack of documentation of EMS information documented on the chart.
Comments: Transfer timely and care management appeared appropriate. Unclear the total amount of crystalloid infused. Lack of demonstrated nursing I&O documentation.

19 Epi/subdural ISS 25
This is an 82-year-old male with a daily ASA history who was involved in MVC. It was report he got out of the car and collapsed. He was intubated at the referral center and was transported via helicopter from the center with 3 hours of initial admission. He was admitted as non-trauma activation with GCS of 3, hypertensive. Neurosurgery was consulted upon arrival and responded timely and to the CT within 30 minutes. The patient diagnosis was a subdural with shift and he was taken to OR for craniotomy within 2 hours. He had an uneventful hospital stay and discharged in 5 days to rehabilitation center.
PI: none demonstrated
Comments: Timely response of neurosurgeon. This was an excellent outcome however from a system perspective this patient may have benefited by a preemptive trauma team response to move the patient in extremes through the system. A timeframe of 2 hours to the OR was lengthy. May consider level I or level II activation criteria inclusion of “transfers from a referral that are intubated with a GCS = or < 8.”

20 Anticipated with opportunity for improvement ISS 54
This is a 67-year-old female restrained MVC passenger who was broadsided by semi-truck. The incident was approximately 90 minutes from the facility, therefore was an air medical transport. She was a GCS 13 at the scene, MAE and then decompensated upon transport. She was intubated X 2 due to main stem intubation with RSI. Due to chronic obesity was unable to place collar. She was a difficult PIV insertion. She was a level 1 activation, with trauma surgeon responding prior to arrival. She arrived with a GCS of 3, pupils fixed and dilated and in PEA. Trauma resuscitation included CPR on arrival, ATLS protocol initiated with vasopressin, bilateral chest tube placements and central line. FAST exam displayed minimal cardiac motion, negative abdomen. Transported to CT approximately 15 minute post admission with bil PTX noted and SAH on CT. Chest tubes were placed 15 minute post CT identification and was placed on vent in the ED. Her Hgb was stable, lactic 5.5 one hour post admission. ABG’s not done/not available. One unit PRBC was given and unknown amount of crystalloids. Diagnosis SAH, bilateral PTX with tension PTX, numerous rib fractures. Total resuscitation time was approximately 2 hours then patient pronounced.
PI: Case was a level III committee review with case presented by TMD. The issue of concern was timeliness of PTX identification and difficulty of identifying tension PTX on initial chest x-ray. Discussion surrounded if attending addressed PTX timely enough. Discussed need to have large gauge needles in radiology available. Decision was case was non survival but PTX may have been identified more timely.

Comments: Trauma peer committee minutes minimal. This was the PI chairs case, appeared chair presented and review own case. Recommend the committee chair delegate cases to another provider to present and led discussion in committee. Questioned the ability to managed extremist patient in the CT. PI: loop closure not demonstrated regarding large gauge needles placed in CT. Issues identified by site reviewer that were not identified and addressed in PIPS forum was: minimal run form documentation by the air medical unit, lack of I & O documentation on the trauma nursing flow sheet, lack of initial ABG’s with bass deficit, the potential of documentation discrepency of initial breath sounds. Noted on nursing documentation to be “clear bilateral” on the trauma flow sheet and “slightly decreased on right side” in ED H&P. Documentation not available if neurosurgeon was contacted.

**21 Anticipated death with opportunity for improvement ISS 12**

This is a 79-year-old MVC restrained driver who was a GCS 15 and was a direct admission from a referral Level III hospital. Complaining of chest pain on admission, he was transferred to the Level II timely as a direct admission and taken directly to cath lab. Diagnoses were an occluded LAD, MI in process, cardiogenic shock, bilateral - rib fractures, sternal fracture. He was admitted to ICU to trauma service. On day 2, he decompensated with increasing vent pressures, metabolic acidosis due to a PTX not identified immediately per ICU. Trauma surgeon was not notified until patient was coding and expires.

PI: Discussion conclusion was the outcome of patient would not have changed due to a non-survival cardiac condition, however PTX was not identified timely. Additionally the trauma attending was not notified timely. Loop closure: per PI documentation there appeared to be an “in the moment “bedside education by TMD to resident and ICU house staff due to this was the TMD case.

Comments: Peer minutes extensive in unidentified PTX and lack of timely communication of trauma attending. Unclear via the PI resolution documentation if education extended to the entire ICU staff or if there has been evidence of a process changes due to education. It appeared the trauma attending had not seen the patient in the ICU prior to death. Documentation minimal and tertiary assessment not demonstrated.

**22 ISS > 25 ISS 41**

This is a 25-year-old male MVC roll over ejected that were transferred from a freestanding ED. He was a level 2 trauma activation, unknown time of trauma surgeon arrival. GCS was 3 on arrival and injuries identified were rib fx’s, PTX, pulmonary contusions, grade 2 liver laceration, grade 3 renal laceration, and a small SDH and SAH TBI. The patient was intubated at the referral center and transferred within one hour. He was transported to CT approximately 10 minutes with stable vital signs. A chest tube was placed timely. Unknown the total fluid amount due to I & O not documented. He was discharged to ICU with a LOS 4 days. Consults included pulmonary, neuro surgery.

PI: Level 2 review of case regarding difficulty delineating network hospitals ED chart and emergency physician documentation verse trauma center ED physician documentation. Education provided by ED medical director in interpretation of documentation of referral ED.

Comments: Care appropriate and efficient. Excellent grading of solid organ by radiology and timely transport to CT. Encourage to address electronic flow sheet I & O documentation by ED nursing. EMS run form was unavailable.
23  Pelvis ISS 27
This is a 33-year-old female who was involved in a MVC with extended entrapment. She was an EMS transport within one hour at the scene with NRB mask applied and PIV started in the field. She was a GCS of 15 and a level 2 trauma activation. She became hemodynamically unstable 15 minutes post admission and was upgraded to a level 1 activation with the trauma surgeon responding quickly. Ortho consulted with arrival approximately 30 minutes post notification. The patient continued to have sustained hypotension, PRBC started with a total of 4 units and 2 units FFP. MTF was not initiated. The patient was hypothermic on admission and warming methods applied and blood warming measure with infusion were initiated. A small 20 gauge was placed in ED; Lactic acid results were in the upper limit and were positive ETOH. The patient was transported to CT approximately 45 minutes post arrival. Ongoing resuscitation efforts continued approximately 3 hours. She was taken to the OR 3 hours postadmission for initial pelvic stabilization management, with a planned OR return for pelvic stabilization. Diagnosis: unstable pelvis fracture of acetabular, pelvic ring, humerus, open scaphoid, femoral neck. Pulmonary emboli was noted on admission CT scan and an IVC filter placed postoperative procedure shortly post admission. LOS 15 days.
PI: Level 2 and 3 review for PE complication on admission. IVC filter placed post OR procedure. Comments: Excellent efforts and documentation of warming of patient in ED prior to OR with the patient reaching norm thermic on arrival to OR.
Reviewer identified issues regarding ABG’s and base excess does not appear to be routinely done with level 1 activation, poor documentation of I & O on the trauma nursing flow sheet. This case had high volumes infused and difficult to determine amount given. The patient was hypotensive in field and met level 1 activation on admission. Reviewer determined this was a potential under triage. PI not demonstrated if under triage was reviewed. Unable to identify if SBIRT screening was conducted and if ETOH consumption addressed. This patient may have been considered for MTP due to ongoing blood products in the OR. Unclear if this case would have been candidates for a pelvic wrap or if she was wrapped. Reviewer noted the placement of a 20 gauges PIV placed in ED in trauma resuscitation on a variety of cases. Would recommend a larger bore for blood infusion and fluid management. The ED length of stay for an unstable patient was extensive. PI program has a STD audit filter in place of 2 hour ED LOS for Level I trauma admissions. Unknown if reviewed for outlier of the audit filter. Documentation of rational for delay in transport to the OR not evident.

24  Pediatric ISS 26
This is a 7-year-old female restrained MVC EMS transport with scene time of approximately 45 minutes. She was a level 2 activation with stable vital signs. She was to CT within 15 minutes of admission with a small SDH and SAH cerebral bleed. The neuro surgeon was consulted and seen in the ED. She was an observation admission to the neurosurgeon 5 ½ hours post admission. She remained stable and was discharged follow day.
PI: Level 1 reviewed for pediatric admission, no care issue identified.
Comments: none

25  Death without opportunity for improvement ISS 43 LOS 1 day
This is a 50-year-old female of a motor cycle crash who was a transfer from a Level III referral hospital. She was an air- med transport with fixed and dilated pupils and unstable vital signs. She was a severe TBI with cerebral edema, SAH, SDH, in extremists. She was transferred within 1 hour, intubated, CT completed with mannitol administration in referral hospital. She was a direct admission to OR approximately 90 minutes post the referral hospital discharge with the neurosurgeon present in the OR. A stat emergent decompressed craniectomy was done. However, the patient remained in extremists and expired within 24 hours. The patient was an organ donor.
PI: Discussion regarding the rational for craniotomy with a non-survivable injury. The neuro surgeon provided a clear decision making rational.
Comments: timely neurosurgeon response and operative procedure. Excellent organ donation process. Excellent management.

26. This was a 51-year-old female found down by family after fall striking head. Full arrest on scene. Intubated by EMS prehospital. On arrival in full arrest. Responded to CPR and epinephrine administration. Initial BP 257/174. Head CT demonstrated SAH. Admitted from ED to ICU with neurosurgical and pulmonary critical care consultation. Activation level: not activated (unclear etiology of trauma, no external signs of injury) Transport Time 6 minutes ISS 25

Seen/evaluated by ED MD. No trauma activation due to unclear etiology of decreased mental status without signs of external trauma. CPR and ACLS performed with return of vitals. TO CT scan (head and spine). CT angio Head. Admitted to MICU. Neurosurgical consultation performed per admission H&P and discharge summary. Patient had anoxic brain injury neurology consult obtained. Brain death criteria met (nuclear scan). Organ donation referral. PI process: Reviewed by TMD and referred to Trauma PI committee. Findings were difficult to determine if trauma etiology. Death was considered non-preventable, no further action. Reviewer Assessment: Care was appropriate. PI review was appropriate. Agree with conclusions. No opportunity for improvement.

27. This 53-year-old male presented to ED after MVC. Complaining of chest pain. Normal vital signs in ED. Patient initially seen at outlying hospital. Transferred to GSMC for diaphragm rupture. Patient arrived to GSMC and had immediate surgical consultation. Hemodynamics normal. Evaluated by trauma surgeon. In OR for ex lap and diaphragm repair. Activation level: Not activated (transfer). There was no activation of the trauma service. This patient waited a prolonged period for evaluation by trauma provider after transfer from outside facility. If activation took place evaluation would have been more expeditious. Transfer Transport Time 19 minutes

Time from arrival to GSMC to trauma surgeon evaluation: 6 hours ISS 16

Seen and evaluated by trauma surgeon. Standard post op care. No complications. PI process: Reviewed by TMD, no referral to PI committee. Reviewer Assessment: Appropriate care and transfer. Prolonged transfer time/time to evaluation by trauma surgeon after transfer to higher level of care (6 hours). Need to initiate appropriate level trauma activation on arrival to GSMC from transferring facility. Referral to PI committee to address prolonged delay in surgical evaluation after transfer.

28. This was a 14-year-old female s/p MVC restrained back seat passenger. Complaining of lower abd pain. Normal hemodynamics. CT abd showed free fluid and fluid near cecum/right colon. Taken to OR for laparoscopy. Required conversion to laparotomy for cecal laceration repair.
Activation level: (not activated) Although surgeon evaluated patient within 15 minutes of arrival to GSMC, no trauma activation was initiated. There is not a protocol for trauma team activation on transfer patient arrival to GSMC.

Transfer Transport Time 25 minutes
Time from arrival to GSMC to trauma surgeon evaluation: 17:17
ISS 17

seen in ED by trauma surgeon. Transfer from outside hospital. No ED evaluation. No trauma activation. Taken to OR. Standard postoperative care no complications.

PI process: Review by TMD, no referral to PI committee.

Reviewer Assessment: Appropriate care and transfer. No trauma team activation on patient arrival to GSMC from transferring facility. Transfers into GSMC should be activated to expedite the evaluation process.

29.

This was a 92-year-old male found down at home in full arrest. Initially altered in field then became apneic. EMS could not intubate. On arrival to GSMC patient was in full arrest. Intubated in ED. Sustained C1, no injury on CT chest, abd pelvis, normal had ct. Admitted to MICU.

Activation level 4. Surgeon arrived 19 minutes after patient.

Transport Time 20 minutes
ISS 6

Seen and evaluated in ED by ED MD. Made level IV consultation. Had CT w/u including head, face, chest, abd, pelvis. Found to have nasal bone fracture and C1 fracture. Neurosurg evaluation occurred in ED. Family and spine team opted for halo placement for C1 fracture. Patient was weaned from mechanical ventilation over the ensuing 2 days. On extubation he deteriorated and family wished to proceed with comfort care only. Patient expired.

PI process: Reviewed by TMD referred to PI committee. Classified as non-preventable by committee.


30.

This was a 57-year-old male s/p MCC. Cardiac arrest in field. CPR for 15 minutes prior to arrival. Intubated in ED on arrival CPR continued. Bilateral chest tubes placed in ED while undergoing CPR. Pulse never returned.

Activation level 1. Surgeon arrived 3 minutes before patient.

EMS arrived at scene
Arrived at GSMC ED no available prehospital documentation

Transport Time
ISS 34

Seen and evaluated by ED MD and trauma surgeon. Both were present in ED prior to patient arrival. CPR continued. Bilateral chest tubes placed. No return of vitals.

PI Process: An issue with prehospital time documentation was uncovered and communicated to the air transport provider. Death was found to be non-preventable secondary to injuries and prehospital CPR of 15 minutes.

31. This was a 41-year-old male s/p MPC (caught under dump truck). Trapped for 45 minutes. C/O back pain, hip pain and arm pain. Initially hypotensive 72/49. Responded to IV fluid without further hypotension. W/U with CT c-spine, CT T/L spine, and CT chest/abd/pelvis. Injuries noted were acetab fracture and femur fx. Patient admitted by ortho service. Activation level 1. Surgeon arrived 13 minutes after patient.

Transport Time 36 minutes
ISS 18

Seen and evaluated by ED MD and trauma surgeon. One episode of hypotension responded to fluid. Ortho injuries identified. No other injuries identified. Admitted to ortho service. Had operative fixation (femur and acetabular). Developed upper extremity nerve palsy. Evaluated with MRI and neurology consult. No abnormality found on MRI. Received PT inpt. Discharged home.

PI process: none

32. This was a 12-year-old male fell while running onto outstretched hand. C/O left arm pain. Transfer from outside facility for peds ortho. Activation level 3. No trauma surgeon required for level 3 activation. There was an activation on arrival for this trauma transfer. Patient arrived and was immediately evaluated by ED MD.

Transfer Transport Time 44 minutes
Time from arrival to GSMC to trauma surgeon evaluation: N/A
ISS 4

Seen and evaluated by ED MD. Appropriate exam and evaluation. Consultation to ortho. Otho eval. Taken to OR immediately after ortho eval. Discharged home post op day #1. PI process: Reviewed by TMD. No referral to PI committee.


33. This was a 91-year-old female on Coumadin therapy s/p ground level fall. C/O pain left leg. Admitted to medicine service on ortho floor. Femur fracture and acute on chronic renal failure. Multiple plain films demonstrated left femur fracture only. Patient developed afib. Postoperatively (femur fixation) patient deteriorated and was transferred to ICU. She developed acute on chronic renal failure, pneumonia, and pressor therapy. Family made patient DNR and she progressed to arrest on hospital day 5. Activation level IV. No surgeon required

ISS 10

Seen and evaluated by ED MD. Admitted to medicine team due to multiple medical history. To OR with ortho for femur fracture. Postoperatively developed complications including acute on chronic renal failure, pneumonia and afib. Continued to deteriorate family made DNR. She expired on hospital day #5. PI process: Reviewed by TMD and referred to PI committee. Committee review found non-preventable death.