Trauma System Consultation
Ventura County
Ventura County, California

January 10th-13th, 2010
American College of Surgeons
Committee on Trauma

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Executive Summary

American College of Surgeons

Trauma System Consultation Visit

Ventura County, California (CA) currently has no organized trauma system. As a result, the majority of injured patients are currently transported to the nearest available hospital. Based upon location and surrounding population demographics, certain hospitals see a higher percentage of injured patients than others, especially with respect to penetrating trauma. As a result, some hospitals have significantly more infrastructure and experience related to trauma care, but delivery of patients to hospitals with more resources or experience is largely a matter of chance or the emergency medical service (EMS) agency preference.

A process to develop a comprehensive trauma system was initiated several years ago. An external consultant was hired to assist the county to develop a trauma system plan, which was subsequently adopted. This plan calls for the designation of two level II trauma centers, one each in the eastern and western regions of the county. In response to the county's request for proposal (RFP), three hospitals submitted applications for trauma center designation, one in the eastern region and two in the western region. All three applicant hospitals have worked to strengthen their trauma programs in order to meet designation requirements.

The purpose of the American College of Surgeons (ACS) Trauma System Consultation (TSC) visit was to assist the Ventura County Emergency Medical Services Agency (VCEMSA) in its plan to develop a county-wide trauma system. This TSC included a review of the county's trauma system plan and an assessment the current status, strengths, and weaknesses of each of three applicants for trauma center designation.

Methodology

The ACS recruited a multi-disciplinary site visit team (SVT) comprised of a trauma surgeon, an emergency physician, a trauma program manager, a pediatric and trauma system specialist, an EMS and trauma system specialist, and an administrative support person. Prior to the visit, assessment tools were developed and provided to the VCEMSA, and these were subsequently shared with applicant hospitals. The SVT reviewed and scored the county's trauma system plan and each hospital application prior to arrival. Scores and analyses were refined based on information gathered from each applicant hospital through stakeholder interviews, reviews of patient records and care processes, and an on-site assessment of hospital resources.

Consensus recommendations were developed by the SVT members regarding specific issues related to the number, verification level, and location of trauma centers within Ventura County, CA. Additional general findings and recommendations about the trauma system plan were also developed.

Key Findings

- All three applicant hospitals demonstrated a strong commitment to the care of injured patients, and to the achievement and maintenance of trauma center designation standards. This commitment is a valuable resource for the people of Ventura County.
- The SVT does not believe that any of the three applicant hospitals has a high probability of achieving ACS verification as a level II trauma center within the next six months.
- With targeted technical assistance, Los Robles Hospital and Medical Center in the east should be ready for an ACS level II verification visit within two years.
- Both western hospitals, St. John's Regional Medical Center and Ventura County Medical Center, should be ready for an ACS level II verification visit within 12-18 months.
- Ventura County Medical Center scored marginally higher overall than did St. John's Regional Medical Center using the assessment tools and in the unanimous opinion of the SVT.
- St. John's Medical Center and Ventura County Medical Center each have unique strengths and weaknesses. Without major structural changes, neither facility appears capable of reliably functioning as the only designated trauma center in the western region.
- Given the dedication of the administration and health professionals of all three hospitals, and the complementary strengths of the individual facilities, it is the opinion of the SVT that injured patients in Ventura County will be best served by designation of all three applicant hospitals, assuming they all achieve and maintain designation standards as confirmed by the ACS Verification Review Committee.
- The current and projected volume of injured patients at each applicant hospital appears sufficient to sustain three designated trauma centers. The advantages gained from system redundancy and surge capacity likely outweigh disadvantages related to low trauma center volume.
- In the future, a reduction in the number of designated trauma centers may result from shortages in critical specialty coverage, especially neurosurgery, which at the present time is barely adequate in two out of three facilities.

Introduction

The purpose of the American College of Surgeons (ACS) Trauma System Consultation (TSC) visit was to assist the Ventura County Emergency Medical Services Agency (VCEMSA) in its plan to develop a county-wide trauma system. This TSC included a review of the county's trauma system plan and an assessment of the current status, strengths, and weaknesses of each of three applicants for trauma center designation.

County Overview/Current Status

Ventura County, California (CA) comprises 1,845 square miles with a population of nearly 800,000 residents, a population density of more than 408 persons per square mile. The county is bordered on the southwest by 43 miles of the Pacific Ocean. It is home to California's smallest deep-water port from which agricultural products produced in the valley's rich soil are shipped. The county is bordered by Kern County to the North, Los Angeles County to the East, and Santa Barbara County on the West. Much of the northern portion of Ventura County is mountainous and sparsely populated.

A strong transportation infrastructure exists in the more densely populated areas of the county with both north/south and east/west access via multi-lane controlled highways. The county has two airports, one with scheduled commercial service connecting to the Los Angeles area. A major rail corridor also passes through the coastal area.

In addition to agriculture, Ventura County has a strong economic base with both professional and trade/manufacturing opportunities. A military presence contributes to the county's economy with both a Naval Air Station and a Naval Construction Battalion. Health care also plays a significant role in the county economy, which includes eight acute care hospitals.

The VCEMSA oversees emergency medical services (EMS), trauma care, and other time critical diagnoses such as stroke and ST elevated myocardial infarction (STEMI). At the time of this consultation, no formal or organized trauma system was in place. Field triage, prehospital treatment protocols, and destination protocols are developed by local EMS agencies, with broad oversight from the VCEMSA. As a result, the majority of injured patients are currently transported to the nearest available hospital. Based upon location and surrounding population demographics, certain hospitals have become the preferred destination for injured patients as a result of established referral patterns and EMS practice. As a result, these hospitals have developed significantly more infrastructure and experience related to trauma care, but delivery of patients to hospitals with more resources or experience is largely a matter of chance.

A process to develop a comprehensive trauma system was initiated several years ago. VCEMSA recently hired an external consultant to help develop the

trauma system plan, which was subsequently adopted. This plan calls for the designation of two level II trauma centers, one each in the eastern and western regions of the county. In response to the county's request for proposal (RFP), three hospitals submitted applications for trauma center designation, one located in the eastern region and two in the western region. All three applicant hospitals have worked to strengthen their trauma programs to meet designation requirements.

Historical Overview of the Trauma Systems Consultation Process
The American College of Surgeons (ACS) appointed an ad hoc Trauma System Evaluation and Planning Committee (TSEPC) in 1996. The purpose of the TSEPC is to assist jurisdictions (state, regional, and local) in the development of inclusive trauma systems by providing formal consultation and technical assistance. The TSPEC uses two documents -- ACS Committee on Trauma (COT) *Regional Trauma Systems: Optimal Elements, Integration and Assessment,* and the federal Health Resources and Services Administration *Model Trauma System Planning and Evaluation* -- as the standard by which trauma systems are evaluated and recommendations formulated. The TSEPC has completed more than 20 trauma system consultations (TSC) over the past 10 years. The trauma system consultation process has typically been conducted at the state level, but a few consultations have been conducted at a county or regional level. The TSC process is well standardized with respect to team composition, conduct for on-site information gathering, and the structure and content of the final report. Consultation visits generally focus on enabling legislation and administrative structure, high level trauma system planning and integration, incentives for broad participation of hospitals in an inclusive system, and development of programs for injury epidemiology, injury prevention, and systemwide quality assurance. Recommendations are purposefully non-prescriptive, owing to the unique challenges and unique strengths found in individual jurisdictions.

The ACS recognized the need for a more focused consultation process to assist jurisdictions in answering specific questions, including the determination of optimal placement, level, and number of trauma centers needed within an inclusive trauma system to serve its population. The Ventura County TSC visit and report mark the ACS's first initiative in such a process. The VCEMSA requested assistance in determining the relative state of readiness and relative strengths of three applicant hospitals seeking designation as trauma centers and the best way to use these resources in the context of a trauma system plan calling for two designated trauma centers. In addition to evaluation of the applicant centers, the ACS was asked to evaluate the strengths and weaknesses of the county trauma system plan.

Methodology
The evaluation of the Ventura County trauma system plan was conducted in the same manner used in standard TSCs. The trauma plan was reviewed by the SVT and evaluated with respect to its adherence to principles outlined in the

Regional Trauma Systems: Optimal Elements, Integration and Assessment and the *Model Trauma System Planning and Evaluation* documents. An interrogatory session was held with trauma system stakeholders to explore elements of the trauma system plan as seen through the eyes of those tasked with implementing it. The SVT reached specific conclusions and recommendations using a consensus-based process.

The evaluation and objective comparison of three hospital applicants for trauma center designation represented a new challenge for the TSEPC. A set of assessment tools were developed and an on-site review process was planned for this process. Semantic differential (quasi-Likert scale) rating instruments were developed to enable SVT members to score the responses of hospital applicants to the criteria outlined in the County's RFP. Tool 1 addressed RFP requirements, including the administrative, physical, and programmatic criteria for trauma center selection. The County's trauma center performance standards are reflective of the ACS's *Resources for Optional Care of the Injured Patient*. Tool 2 used a selection of key indicators from Health Resources and Services Administration's *Model Trauma System Planning and Evaluation* document as an additional measure of a hospital's performance within the trauma system. The scoring tools, the agenda for planned on-site visits, and intended methodology were shared with the VCEMSA and the applicant hospitals in advance of the consultation, and all parties accepted the proposed methodology.

To ensure consistency in information gathering at each hospital, and to provide practice for a future ACS verification visit, the on-site reviews were roughly patterned after the site visits conducted by the COT Verification Review Committee. The SVT clearly stated to VCEMSA staff and the leadership in applicant hospitals that the on-site visits do not replace the ACS' trauma center verification process. This information was acknowledged by the VCEMSA staff and the leadership of the applicant hospitals. VCEMSA stated that achievement and maintenance of ACS trauma center verification is a condition of trauma center designation in Ventura County. See the appendices for details of the assessment tools and the schedule used for on-site reviews.

The TSC was conducted on January 10, 2010 to January 13, 2010, in Ventura County, CA. The ACS engaged a multidisciplinary site visit team (SVT) comprised of the following:
- Robert Winchell, MD, FACS, Team Leader
- Kathy J. Rinnert, MD, MPH, FACEP
- Mary Sue Jones, RN, MS
- Jane R. Ball, RN, DrPH
- Nels D. Sanddal, REMT-B, PhDc
- Holly Michaels, TSPEC Program Administrator

See Appendix A for brief biographical information about each team member.

Prior to the site visit, the SVT discussed the consultation process during a conference call. Each team member was assigned specific sections of applications for detailed review; however, each team member independently evaluated the entire application of all three hospitals using Tool 1. These individual SVT objective scores were augmented by information gathered from stakeholder interviews, review of patient records and care processes, and on-site assessment of hospital facilities and resources. Tool 2 was completed after the on-site information gathering. A final composite score for Tools 1 and 2 was generated according to a pre-determined weighting system that valued the Ventura County RFP criteria (Tool 1) at 70% and the trauma system indicators (Tool 2) at 30%. As a group, the SVT identified the strengths and weaknesses and made recommendations for each hospital applicant.

Findings

Trauma Plan

The Ventura County Health Agency (VCHA) and VCEMSA are to be commended for creating a plan that outlines the development of a county-wide trauma system. The trauma system plan, including appendices, was reviewed by all members of the SVT. Two team members were assigned to focus on the plan, and they talked with a large group of stakeholders who represented the three hospital applicants, five community hospitals, EMS agencies, prehospital providers, fire, highway patrol, law enforcement officers, communications centers, and disaster preparedness. Representatives from VCHA and VCEMSA were also present. Stakeholders and VCHA/VCEMSA representatives were asked questions related to sections of the trauma plan for which the independent review team members needed clarification. Questions were also asked to assist with the scoring of an assessment tool that was based upon several indicators from the Benchmarks Indicators and Scoring tool in the federal Health Services and Resources Administration's *Model Trauma System Planning and Evaluation* document. The information acquired through this process was used by the SVT to reach the following consensus-based conclusions and recommendations.

Strengths

- The trauma system plan was developed with the active involvement of all county hospitals and other significant stakeholders described above. Stakeholders have endorsed the plan.

- Hospital administrators, chief nursing officers, trauma medical directors, trauma program administrators, and trauma registrars all participated in trauma system development and valued their roles in the planning process.

- The stakeholders work together in a very collaborative fashion, and this collaboration will hopefully continue regardless of the outcome of the trauma center designation process.

- The lead agency has sufficient legal authority to adopt and implement operational and performance standards, including enforcement.
- Draft protocols for trauma triage and destination centers have been developed.
- Trauma surgeons participate on the Prehospital Care Committee and have input into the development and revision of EMS trauma protocols.
- A process for the review and revision of trauma-related protocols exists.
- Injury prevention and public information and education are addressed, and designated trauma centers have a role in supporting the VCHA in these efforts.
- Many aspects of specialty trauma care have been addressed:
  - Inter-facility transfer is planned for children with critical injuries when the capabilities of the designated trauma center are exceeded.
  - Inter-facility transfer is planned for patients with serious burns.
  - Inter-facility transfer is planned for patients with spinal cord injuries when capabilities of the designated trauma center are exceeded.

Weaknesses

- The trauma system plan is not well integrated with public health.
  - No data sharing between public health and the trauma system is evident.
  - Injury surveillance is not conducted by the VCHA.
  - A population-based description of injuries by location, mechanism, and severity is not available.
  - While the integration with public health emergency preparedness is stated in the trauma system plan, the participation of the trauma medical directors in the development and refinement of the county's emergency preparedness response plan is not described.
- The trauma system plan lacks specific priorities, an action plan, and a timeline for implementation across the broad spectrum of essential activities following the initial task of trauma center designation.
- Rehabilitation has not been integrated into the trauma system plan.
- Pediatric trauma care expectations for designated trauma centers are not well defined, especially for children without critical injuries who require hospitalization but are likely to stay within the county.
- No funding for the trauma system infrastructure is available beyond the fees collected from the designated centers.

- The trauma system plan does not include a mechanism for system-level quality assurance. Specifically, no process has been developed to evaluate the effectiveness of triage and transfer protocols, to assess trauma care provided by designated trauma centers and non-designated hospitals, or to review decisions regarding inter-facility transfer.

- The trauma system plan states that an inclusive trauma system is desirable, but in effect it establishes an exclusive system. The roles of non-designated hospitals and their expected responsibilities within the trauma system have not been defined.

- A county trauma registry has not yet been implemented

    o Data submissions procedures for designated centers have not been established.

    o VCHA has not yet determined if, or how, trauma data will be collected from the non-designated hospitals.

    o The processes for cleaning submitted data and running reports, and for uploading data to the California trauma registry, have not been developed.

- The Trauma Advisory Committee has indistinct lines of administrative authority, and lacks representation from several key stakeholder groups.

Trauma Plan Recommendations

- Explore alternate data sources to develop a description of injuries in Ventura County, for example the UB04 (hospital discharge data), aggregate reports submitted to the National Trauma Data Bank by the designated trauma centers, and mortality data from the state's vital statistics bureau.

- Improve integration of designated trauma centers into emergency preparedness planning.

- Establish priorities and timelines for a phased implementation of the trauma plan.

- Integrate rehabilitation services into trauma system plan.

- Establish clear standards for the care of pediatric trauma patients, especially at designated centers.

- Seek additional funding for trauma system infrastructure and oversight that is less dependent upon the contributions from designated centers.

- Establish a systemwide quality assurance plan, looking initially at broad indicators of system performance such as mortality, interfacility transfer activity, and times to definitive care. Seek consultation from established trauma systems, if needed, to facilitate progress.

- Develop an inclusive trauma system involving all acute care hospitals. If creation of additional levels of trauma center designation is not desired, add a bottom tier such as "participating trauma hospitals" or "system hospitals" to include all non-designated centers.

- Identify a limited dataset that all acute care hospitals will be expected to contribute to the county trauma registry. This will provide a denominator of injuries and make it possible for systemwide performance improvement to be implemented.

- Plan for data linkage between the trauma registry and the EMS database.

- Design the Trauma Advisory Committee as a policy advisory committee that makes recommendations to the Ventura County EMS Medical Director and VCEMSA Director. Neither the EMS Medical Director nor the VCEMSA Director should be a voting member on the committee.

- Consider adding additional members to the Trauma Advisory Committee to represent the continuum of trauma care and the community, such as representatives for injury prevention, rehabilitation, a consumer, and an elected official.

- Develop subcommittees or task forces of the Trauma Advisory Committee to address specific trauma system issues and to make recommendations to the full Trauma Advisory Committee.

  o Examples could include development of the performance improvement process, development of the county's trauma registry and procedures for data submission and data cleaning, injury prevention collaboration, and trauma education outreach collaboration.

  o Subcommittees or task force membership should not be limited to Trauma Advisory Committee members, but should include additional stakeholders based upon interest and expertise.

Evaluation of Trauma Center Applicant Facilities

The following assessments outline the conclusions reached by the SVT after evaluation and review of RFP's, meeting with hospital representatives, on-site review of patient charts and care processes, and an assessment of physical facilities. Hospital applicant conclusions are presented in alphabetical order.

Los Robles Regional Medical Center

Los Robles Regional Medical Center (LRRMC) is a California corporation, organized on November 12,1964, owned by Hospital Corporation, LLC, an affiliate of Hospital Corporation of America (HCA), Incorporated. The hospital is located in Thousand Oaks, CA and has 359 licensed beds, of which 221 are in use. The facility has 32 total critical care beds, 9 pediatric beds, and 9 operating rooms. LRRMC has provided care for trauma patients under a formal policy since 2002.

Trauma Service

The LRRMC trauma system configuration described in the RFP was not yet fully implemented at the time of the site visit. Thus, the patient records reviewed and performance improvement (PI) documentation were not reflective of future anticipated results.

The trauma medical director (TMD) is a part-time position (.4 FTE). The position is currently filled by a private-practice general surgeon who has a professional interest and residency-based training in trauma care and current Advance Trauma Life Support (ATLS) certification. The TMD seems engaged in the trauma program and demonstrates good leadership skills. An appropriate job description exists with sufficient authority to fulfill the duties of the post. The TMD is not currently involved in regional or national trauma organizations and will need to demonstrate such involvement to meet ACS level II verification standards. The trauma program manager (TPM) is a full-time position, with an appropriate job description. The current TPM demonstrates effectiveness and appropriate engagement with the program; however, this individual has been in this position for less than one year and has no prior experience as a TPM.

The trauma call panel is comprised of a subset of the general surgeons who are on-staff at LRRMC and meet appropriate standards, including ATLS certification and continuing medical education (CME) requirements. The trauma surgeon on call may, at times, also be on call for emergency general surgery, with appropriate backup. Thus far, interest among general surgeons at LRRMC has been sufficient to fill the call panel, however, long-term viability has not been demonstrated, as the current trauma system has not been fully implemented. Data regarding compliance of trauma surgeon response times are limited due to the newness of the trauma system and documentation standards.

Patients admitted to LRRMC remain under the primary care of the admitting surgeon throughout the hospital stay. The TPM and TMD perform routine rounds on all trauma patients and work to assure appropriate care and compliance with standards, as well as monitoring care for PI purposes. The current processes aimed at consistent and uniform quality of care appear adequate, regardless of admitting attending surgeon. Nonetheless, it should be noted that the hospital has little actual experience with the trauma program at the time of the review. Based on the experience of other trauma centers with similar configuration, maintenance of consistency and standards of care within a heterogeneous group of surgeons taking trauma call may prove to be a significant challenge.

EMS Access and Emergency Department Facilities

Ground ambulance access to LRRMC is a single lane pull-through driveway with a keypad-secured doorway accessing the Emergency Department (ED). Access is not optimal for more than one ambulance at a time, but it is sufficient for current volume. Air medical access to LRRMC is by a lighted rooftop helipad on the nearby 4-story parking garage. The helipad is California state-approved, and it has a perimeter fire suppression system. It takes approximately two to three minutes to transport patients from the helipad to the ED, through a key-accessed elevator and then traversing a driveway into the ED. It is not known if LRRMC has coordinated with the local fire department regarding response to an aircraft crash or fire.

Prior to arrival at the hospital, ground and air ambulances relay patient information to the ED via dedicated radio equipment. Mobile intensive care nurses (MICN) monitor these communications, provide care instructions, and initiate ED and hospital-wide trauma notifications. A tiered response is used and alert level is determined by the MICN. Inadequate data exist to assess how effectively this system is utilized.

The ED has a patient volume of 36,000 per year. It has 23 beds, including a two-bed trauma resuscitation area. Standard resuscitation equipment and supplies for acute trauma care and resuscitation are readily available. The trauma bays are used for nontrauma or nonacutely ill patients when needed. Staff reported that the trauma bay can be rapidly cleared in the event of a trauma admission. The ED bed capacity is routinely limited by as many as three to ten patients awaiting an inpatient bed. The hospital's internal policies and procedures are inadequate to address these problems, and preventive processes have not been developed. The current patient-flow challenges may worsen if trauma patient volume increases.

The ED is staffed by a 20 physicians, 19 of whom are board certified in emergency medicine (EM). Three have pediatric emergency specialization. Most physicians have taken ATLS at least once. Level II verifications will require that all EM physicians who are not EM board certified to be current in ATLS. A staggered physician scheduling system is used to provide deepest coverage at peak hours. The ED is covered by a single physician for several hours overnight.

The hospital does not have a residency program and does not use house officers for physician coverage. The ED physician may be the only physician in the hospital at night, and must respond to in-house emergencies. This potentially leaves the ED without physician coverage. This issue is not currently tracked by the trauma PI process. To meet level II verification standards, the potential absence of the ED physician must be monitored by the PI process.

ED nurse staffing includes registered nurses (RN). Overall levels of Trauma Nursing Core Course (TNCC), advanced cardiac life support (ACLS), and mobile intensive care nurse (MICN) certifications are good. Adequate numbers and types of personnel are designated to respond to trauma activations and response time criteria are established. Again, response time compliance data are lacking due to the newness of the trauma program.

Radiology

Radiology services include plain x-rays, computerized tomography (CT), interventional radiology (IR), and magnetic resonance imaging (MRI). Initial plain films are performed with portable machines in the two-bed trauma bay. Nearby radiology suites provide added plain film capability after the patient is stabilized.

CT capability consists of 2 scanners, the primary scanner (16-slice) located adjacent to the ED and the back-up scanner (16-slice) located in an outdoor trailer. If only the backup scanner is operational the patient must be transported outside the hospital, crossing both the ambulance bay and driveway. A CT technician is not in-house 24 hours a day every day, and when not in-house, the on-call CT technician has an expected 30 minute response time. The PI process does not have sufficient data to assess potential delays related to CT availability. A radiologist is in-house during daytime hours, and a teleradiology service interprets films during off-hours. The age, technology and location (backup) of current CT scanners is not optimal, but sufficient to perform necessary studies.

Three IR suites are located near the ED, with adequate equipment. The reliability of IR coverage and standards for response time were not established at the time of the visit.

Operating Room and Post-Anesthesia Care Unit

LRRMC has 10 operating rooms (OR). No OR is dedicated to trauma. When a tier 1 activation or urgent need for a trauma OR occurs, the OR personnel hold the first open OR until notified by the trauma surgeon that it will not be needed. While it is not common for the hospital OR to operate at full capacity, both trauma and OR personnel reported that an OR can be made available expeditiously. Delay to OR is tracked by the PI process, and no identified cases of delay occurred during the limited period of data collection. Given the low volume of penetrating trauma, this may be an acceptable arrangement. The OR suite is sufficiently equipped and fully capable, including cardio-pulmonary bypass.

The post-anesthesia care unit (PACU) has 15 beds, and it is appropriately equipped and staffed as needed. The PACU is rarely used to hold intensive care unit (ICU) patients, either post-operatively or as overflow.

Intensive Care Unit

The ICU has 30 beds, a 10-bed surgical ICU, a 10-bed medical ICU, and a 10-bed coronary care unit (CCU). The CCU beds are also used for cardiac surgery post-operative care. The medical and surgical ICUs are physically adjacent. The physician and nursing staff are much the same for both units, so beds can be flexed as needed. The ICU space is well laid out and appropriately equipped. Nursing staff have appropriate training, many with additional certifications including the Trauma Nursing Core Curriculum (TNCC). Staffing ratios are appropriate.

No formal ICU physician service exists. All patients are managed by their primary attending, with consultation from specialty services, including a pulmonary medicine-based critical care group. An ICU medical director provides general oversight, but rarely intervenes in individual patient care decisions. The TMD functions as the surgical ICU director. The current TMD has no formal critical care training. Daytime coverage of acute problems is provided by the on-call trauma team. No standing night-time physician coverage exists in the ICU, so emergencies are covered by the ED physician until the on-call team arrives. The on-call team may either be at home or in-house. Nursing and physician personnel reported that this process works well.

All appropriate care modalities, including dialysis, are available. Neurosurgical critical care is usually provided by the neurosurgical consultant. The overall system appears to be adequate for the current patient population. It is important to note that little institutional surgical critical care experience exists, and night-time physician coverage for acute problems, especially neurosurgical critical care, may not be sufficient if trauma volume or acuity increases.

Laboratory and Blood Bank Services

Clinical laboratory support services include predetermined trauma resuscitation panels (common blood and chemistry analyses) and blood banking. Blood products (2 units of O negative packed red blood cells [PRBC]) are routinely delivered to the ED for the higher tier trauma activations, with additional products available upon request. Protocols and procedures for massive transfusion are in place. Adequate products (PRBC, fresh frozen plasma [FFP], platelets, cryoprecipitate, and factor VIIa) are available in the blood bank with additional products accessible from a commercial blood center 30 minutes away. PI processes are in place to monitor turnaround times for laboratory tests and blood products.

Specialty Services

A large neurosurgery group provides call coverage, with 4 surgeons on the call panel. The frequency of operative intervention is low, and response times are reported to be good, though little PI data are available due to newness of the trauma program. Management of traumatic brain injury (TBI), both operative and non-operative, is primarily directed by the neurosurgeon. The neurosurgical representative expressed full support for the trauma program.

A sufficient panel of orthopedic surgeons supports the trauma program. One orthopedic surgeon performs complex pelvic and acetabular fracture surgery, so few patients with those injuries are transferred out. The orthopedic surgeons on the call panel are all in private practice, so an incentive exists to do cases when patients come in rather than hold them for surgery until the next day. No designated OR time is reserved for urgent orthopedic cases. If cases are not done the night they come in, they must be added on to the next day's OR schedule. An orthopedic surgeon stated that this is not a problem due to current level of OR utilization, however this may become a problem if the hospital becomes busier.

LRRMC has 9 pediatric inpatient beds, but it has a low average pediatric census and limited pediatric specialty coverage. The hospital has no pediatric intensive care unit and all critically injured children are transferred. The hospital has Emergency Department Approved for Pediatrics (EDAP) certification, assuring appropriate pediatric training of ED personnel, equipment for the resuscitation of injured children, and a pediatric physician or nurse consistently available.

Outreach and Injury Prevention

A request for consultation or transfer from another hospital is fielded by an emergency physician. The trauma program is not routinely involved in this process. No monitoring of the appropriateness and efficiency of the consultation provided occurs. No formal mechanism exists to provide feedback to the referring hospital or physician after transfer.

Outreach to the general public includes first aid classes and cardiopulmonary resuscitation training. Some injury prevention outreach has been initiated, but a coordinated program of injury prevention outreach does not exist.

Training and Education

LRRMC offers several educational opportunities to staff physicians, and ATLS training is encouraged. All ED nurses are required to have current TNCC, Advanced Cardiac Life Support (ACLS), Pediatric Advanced Life Support (PALS) course completion, and continuing education to meet the EDAP requirements. Intensive care nurses have a skills lab twice a year. Prehospital care providers are offered continuing medical education, and a skills lab for paramedics is provided. LRRMC is an approved provider of clinical training for the Ventura County Paramedic Program. An education plan has been developed that

outlines future trauma-specific training that will be offered quarterly to physicians, nurses, and other health professionals caring for injured patients.

Trauma Registry

Lancet Trauma One™ software is used for the trauma registry. This is consistent with the software used by the county's other trauma centers. It was hoped that all hospitals using the same software would expedite future development of a county trauma registry. Data collection began in November 2008, and is accomplished by a 0.6 FTE trauma registrar. Data collection was current within about 4 weeks at the time of the site visit. All patients meeting county criteria, all trauma activations, and all trauma consultations are included in the trauma registry. The TPM regularly reviews ED patient logs to ensure that all eligible patients are captured.

The trauma registry includes 436 patients for 2009. Using hospital discharge data, the hospital reported a total of 882 injury admissions with International Classification of Diseases 9th edition (ICD9) injury codes over a 12 month period (October 1, 2008 through September 30, 2009). Trauma program personnel believe that many of the above cases not captured in the trauma registry are orthopedic injuries. Data from 2009 revealed that 96.6% of the trauma registry patients have blunt trauma, 2.1% have penetrating trauma, and 1.3% have burns or other trauma.

The Registrar and TPM are still learning the full capabilities of Lancet Trauma One™. While they were able to produce the reports and data requested, the presentation format and retrieval skills were at a basic level. No examples of reports routinely provided to the trauma committees were included in the pre-review documents or provided to the SVT on-site.

Trauma Performance Improvement Program

A written trauma PI plan was submitted with the application. It was developed in April 2009 and revised in October 2009. The TPM reviews all activations, potentially missed activations, trauma patient records, and trauma care processes on a PI Case Review Tracking Form. The current process is highly dependent upon the TPM but is workable for current patient volume.

The Trauma Multidisciplinary Committee meets monthly 11 times a year, followed by the Peer Review Committee meeting. All trauma patients for the preceding month are discussed at the monthly meetings. Representatives of specialty services and hospital programs related to trauma attend these meetings, and physician liaisons are required to attend 50% of these meetings. Meeting minutes are kept in the office of the Vice President for Quality Improvement.

A representative of the hospital quality improvement program sits on the Trauma Multidisciplinary Committee, and a representative of the medical staff office serves on the Trauma Peer Review Committee. Issues from the Trauma

Multidisciplinary Committee move up through the hospital quality improvement committee, and those from the Trauma Peer Review Committee move into the hospital peer review process.

<u>Trauma PI Projects</u>

The TPM began tracking physician response times in August 2009. Full implementation of the current trauma call panel and benchmarks did not begin until January 2010, so limited data were available to the SVT for review. A successful trauma PI example was the implementation of a protocol for C-spine clearance to reduce variation in care practices by physicians. Other PI projects have led to the development of a deep vein thrombosis (DVT) protocol and a massive transfusion policy.

When the TPM identifies issues during chart reviews, discussions are initiated with the department, the individual provider, or the TMD. At the time of the SVT, no focused audits were being performed to assess compliance with specific policies or clinical processes. The ED does not perform any trauma-specific nursing PI audits. ED physician time out of ED for in-house emergencies and identification of trauma activations during those times of absence are not tracked.

Los Robles Regional Medical Center Summary Findings

Overall, LRRMC shows strong administrative and adequate physician staff commitment to the trauma program. Both orthopedics and neurosurgery appear to be well covered, however the hospital has a significant reliance upon call stipends, similar to many trauma programs in other areas. Some areas of specialty coverage, including IR, were not fully in place at the time of the site visit. The physical plant is generally up to current standards and adequate for projected volume. CT scanning capability (two 16-slice scanners) is adequate, but not ideal. Trauma program clinical direction and the trauma PI process are both immature, given the short time that these programs have been fully active. Both the TPM and TMD have little prior direct clinical experience in their roles. Outreach and injury prevention programs are in their infancy. The hospital does have a strong education program, both for in-house providers and for prehospital providers.

On balance, LRRMC appears to have the resources and commitment to achieve verification as a level II trauma center. Given inexperience with program management, especially with PI and data analysis, and the lack of historical records, a 24 month time frame to seek verification seems the most realistic. The trauma program leadership would likely benefit from focused external assistance for continued program development, especially in regards to the PI program.

<u>Scores from Assessment Tools</u>

RFP Scoring   Passed
Benchmark, Indicator, and Scoring Process   Passed

Estimated time frame for Level II verification:
- Unlikely within 12 months
- Possible within 18 months
- Most probable within 24 months

Strengths
- Strong institutional commitment.

- Good leadership from the TMD, ED director, and TPM.

- The trauma program has made substantial progress in short time.

- Good laboratory resources are present.

- An education plan has been developed.

- Some injury prevention outreach has been initiated.

- Emergency department nursing requirements meet all requirements.

- The hospital has achieved EDAP certification.

- The hospital has a dedicated pediatric inpatient unit.

- A written performance improvement plan exists.

- The hospital is a STEMI center and a chest pain center.

Weaknesses
- The overall application was weak, with significant lack of detail.

- The trauma program leaders are inexperienced, and as a result they lack clear vision and focused direction for trauma program development.

- No dedicated administrative support is provided to the trauma program.

- The emergency physician responds to in-house emergencies at night, leaving the emergency department without coverage. Impact of these responses is not tracked by the trauma PI program.

- No night-time medical coverage for the intensive care unit is present in-house, and very limited surgical critical care expertise is present in the hospital.

- IR physicians do not yet have a contract requiring them to take call. An appropriate response time for IR has not yet been determined.

- The age and capacity of CT equipment.

- A CT technician is not in-house 24 hours, 7 days of the week.

- The OR does not have dedicated orthopedic time for urgent cases.

- Outreach to referring hospitals has not been initiated.

- The PI program is currently case-based rather than project-based.

- The trauma registrar lacks skill in manipulating data and preparing reports using the registry software.

<u>Recommendations</u>
- Seek consultation or technical assistance for trauma program development so that program development can occur at a faster pace.

- Encourage the TMD to seek opportunities for networking with other trauma director experts.

- Seek training from the software vendor so the trauma registrar can gain more expertise in generating reports from the trauma registry.

- Provide dedicated administrative support for the trauma program.

- Develop a policy for IR coverage.

- Consider upgrading one or both CT scanners.

- Ensure that a CT technician is in house 24 hours, 7 days a week.

- Track responses of the ED physician to in-house emergencies through a PI process (an expectation for level II verification).

- Consider increasing medical coverage in the ICU, and acquisition of additional expertise in surgical critical care.

- Provide dedicated time for urgent orthopedic cases in the OR each morning.

- Develop a feedback mechanism loop closure for consultations and transfers from referring facilities.

- Interface with the local fire department regarding helicopter crash response.

St. John's Regional Medical Center

St. John's Regional Medical Center (SJRMC) was founded by the Sisters of Mercy in 1912 and joined Catholic Healthcare West (CHW) in 1986. CHW is a California nonprofit public benefit corporation. The hospital is located in Oxnard, CA and has 265 licensed beds, all of which are in use. The hospital has a total of 20 ICU beds, 0 pediatric beds, and 11 ORs. SJRMC has been providing trauma care services as described in the RFP for many years. SJRMC is not a training facility for physicians, and so there are no house officers.

Trauma Service

The configuration of the trauma system at SJRMC, as described in the RFP, was not yet fully implemented at the time of the site visit, and thus patient records reviewed and PI documentation are not reflective of anticipated results going forward. The TMD is a full-time position (1.0 FTE), currently filled by fellowship trained surgeon with added qualification in surgical critical care. He has been in the position for 8 months, is engaged, and has good leadership skills. The TMD job description is appropriate with sufficient authority to fulfill the listed responsibilities. The TMD is involved with regional and national trauma organizations. He is assisted in clinical tasks by the previous interim TMD, a general surgeon with prior experience as a TMD at a level II trauma centers.

The TPM is a full-time position (1.0 FTE), with an appropriate job description. The current TPM has extensive clinical experience and prior experience as a Trauma Nurse Coordinator for Santa Barbara County EMS. The TPM has been in her position since 2007, and previously served as the prehospital care coordinator at SJRMC. The TPM retains supervisory responsibility for prehospital care coordination and EMS interfaces at SJRMC.

The trauma call panel is comprised of 8 SJRMC surgeons, 4 of whom have completed a trauma/surgical critical care fellowship. The call panel has limited involvement from current SJRMC staff, and includes the prior interim director, newly hired surgeons recently separated from the military, and at least one surgeon from a near-by trauma center working on a per-diem basis. All meet appropriate standards including ATLS certification and CME requirements, and most have formal training and experience in trauma care. The surgeon on-call for trauma does not simultaneously cover emergency general surgery. Thus far, the combination of employed surgeons, interested general surgeons, and trauma surgeons from other centers appears to be sufficient to fill the call panel, but the long-term sustainability of the arrangement has not been determined as the system is not yet fully implemented.

Patients admitted to the hospital remain under the primary care of the admitting surgeon throughout the hospital stay. The TPM and TMD perform routine rounds on all trauma patients, and work to assure appropriate care and compliance with standards, as well as monitoring of care for PI purposes. Current systems to promote uniformity and quality of care, regardless of admitting attending appear

adequate, but there was little actual experience with the full trauma program configuration at the time of the site visit.

EMS Access and Emergency Department

Ground ambulance access to the hospital is by a circular single-lane pull-through driveway with secure keypad access into the ED. Air medical services access the hospital by a lighted ground level helipad located in the parking lot, approximately 100 yards from the ED. The helipad is state approved and security cars block parking lot access when a helicopter is expected. The helipad has no perimeter fencing or fire suppression system. Hospital officials noted that these safety features are not required. No formalized plans have been developed with the local fire department for crash response. Patient transport from the helipad to the ED takes approximately two to three minutes along an uncovered walkway that crosses the parking lot and access roadway.

Prior to arrival at the hospital, ground and air ambulances relay patient information to the ED via dedicated radio equipment. MICNs monitor these communications, provide care instructions, make triage decisions, and initiate ED and hospital-wide trauma notifications. While the ED performs MICN field audits (assessing the adequacy of field care), the linkage to process improvements for the trauma patient is not clear.

The ED has 21 beds, including a 3-bed trauma bay. The trauma bays are used for nontrauma or nonacutely ill patients when needed. Staff reported that the trauma bay can be cleared on short notice, so that use of the trauma bay by other patients does not affect readiness. Standard resuscitation equipment and supplies for acute trauma care are readily available. The physical plant is of sufficient size and meets current standards.

The ED has an annual patient volume of approximately 41,000 patients. Physician staffing is provided by a group of 20 physicians, 15 of whom are board certified in Emergency Medicine, and two are board-eligible. A single ED physician covers the overnight, and this physician responds to in-house emergencies, leaving the ED without attending coverage. These absences are not tracked by the trauma PI process. ED nurse staffing includes registered nurses (RN) with TNCC and ACLS education, and MICN capabilities. Adequate numbers and types of personnel are designated to respond to trauma activations. Response time criteria are established; however the current trauma program has been in place for a short time, so no historical compliance data were available.

Diversion of EMS traffic and ED bed saturation are recurrent issues that require a "crisis" response from hospital administration, nursing, and staff. Internal policies and procedures are in place to resolve these problems; however effective preventative processes have not been identified.

Radiology

Radiology services include plain x-rays, CT, IR, and MRI. Initial plain films are performed in the 3-bay trauma suite using portable machines. Both CT (one 16 slice scanner) and MRI are located in close proximity to the ED. The age of the CT scanner is not optimal, but it is sufficient to perform necessary studies. A new CT scanner is scheduled for delivery in 2010. CT technologists are available 24 hours 7 days a week. Films are read by the staff radiologist during regular hours and by a teleradiology service after hours. The hospital has three full angiography suites, but an agreement for 24-hour coverage by interventional radiologists was not in place at the time of the site visit.

Operating Room and Post-Anesthesia Care Unit

The hospital has 11 ORs, and six are in regular use. One OR is maintained open and staffed for trauma at all times. If the first trauma team begins a case, a backup team is called in immediately. This represents a significant commitment of resources on the part of the hospital. Given the relatively high volume of penetrating trauma it is, likely, a wise investment. Delays to the OR are tracked by the PI process, and no delays related to OR availability have been identified. The OR suite is sufficiently equipped, including cardiopulmonary bypass. The PACU has 10 beds which are appropriately staffed and available as needed. The PACU is rarely used to hold ICU patients, either as post-operative or overflow.

Intensive Care Unit

The ICU has 20 beds, 10 medical and 10 surgical. The units are physically adjacent and share physician and nursing staff, so beds can be flexed as needed. The ICU space is well laid out and appropriately equipped. Nursing staff have appropriate training and good levels of added certification, including TNCC. Nurse staffing ratios are appropriate.

The hospital has no formal ICU service. All patients are managed by their primary attending, with consultation from specialty services, including a pulmonary medicine-based critical care group. A medical director of the ICU provides general oversight but rarely intervenes in individual patient care decisions. The hospital plans to begin 24 hour intensivist coverage in the ICU, using the existing pulmonary-trained group, but details were not finalized at the time of the visit. Once this coverage agreement is in place, plans were described for daily ICU rounds by the covering intensivist. The TMD has qualification in surgical critical care, and he functions as surgical director.

Daytime coverage of acute problems is provided by the on-call trauma team. With no standing night-time physician coverage in the ICU, emergencies are covered by the ED physician until the on-call team arrives. The on-call team may either be at home or in-house. Nursing and physician staff reported that this system works well, but PI processes do not exist to confirm this. All appropriate care modalities, including dialysis, are available. Neurosurgical critical care is

usually provided by the neurosurgical consultant. The overall system appears to be adequate for the current patient population, but night-time physician coverage for acute problems, especially neurosurgical critical care, may not be sufficient if volume or acuity increases.

Laboratory and Blood Bank Services

Clinical laboratory support includes predetermined resuscitation panels (common blood and chemical analyses) and blood banking. Blood products (two units of PRBC) are routinely delivered to the ED for the most acute trauma activations, with additional products available upon request. Policies and procedures for massive transfusion are also in place. Adequate products (PRBC, FFP, platelets, cryoprecipitate, factor VIIa) are available with additional products accessible from commercial blood center located 20 minutes away. Turnaround times for laboratory tests and blood products are tracked and processes are in place for PI.

Specialty Services

Two neurosurgeons provide call coverage at SJRMC, one of whom also takes occasional call at another hospital receiving trauma patients. The surgeon involved reported that he will exclusively be taking call at SJRMC in the event of trauma center designation. Frequency of operative intervention is low, and response times are reported to be good. Management of TBI, both operative and non-operative, is primarily directed by the neurosurgeon. The neurosurgical representative stated full support for the trauma program. However, the long-term viability of call coverage by only two individuals is doubtful. Even if this arrangement is acceptable to the two current neurosurgeons, it is highly unlikely that a replacement could be recruited in the event of illness or retirement of either neurosurgeon. It appears likely that additional neurosurgical resources will be required for long-term maintenance of level II verification.

A sufficient panel of orthopedic surgeons is available for the trauma program. One surgeon treats complex pelvic and acetabular fractures, so few patients with those injuries are transferred out. Daily dedicated OR time for urgent orthopedic cases is provided. The orthopedic representative stated full support for the program, and reported that the current structure is both functional and sustainable.

SJRMC has no dedicated pediatric inpatient beds and has very limited pediatric specialty coverage. Children who need hospitalization are admitted to an adult unit with nurses cross-trained in pediatrics. All children with critical injuries are transferred as the hospital has no pediatric ICU. The ED has appropriate equipment for the resuscitation of injured children, although it has not sought EDAP certification. Urology coverage is not provided.

Outreach and Injury Prevention

A request from a community physician or community hospital for consultation or interfacility transfer is responded to by a trauma surgeon. No method to assess the appropriateness and efficiency of the advice provided currently exists, and no formal mechanism has been developed to provide feedback to the referring hospital or physician.

Outreach to the general public includes information about the trauma system, education about the universal emergency access number (911) to school children and in first aid classes, and cardiopulmonary resuscitation training. The medical center is actively engaged in injury prevention activities and addresses a nice mix of injury mechanisms and age groups.

Education and Training

The trauma program provides education during the trauma team orientation, monthly trauma topics, and the morbidity and mortality conference. All of these education opportunities are open to community physicians, nurses, mid-level and prehospital care providers. All ED nurses are required to have current status of TNCC, ACLS, and PALS course completion. TNCC is offered twice a year and slots are saved for nurses from other hospitals. The ED and ICU have full time nurse educators. The Course in Advanced Trauma Nursing (CATV) is also desired by the ED and ICU nurses.

Prehospital care providers are offered CME, and a skills lab for paramedics is provided. The hospital is an approved provider of clinical training for the Ventura County Paramedic Program. A partial list of 2010 formal training opportunities developed for physicians, nurses, and prehospital care providers was provided to the SVT.

Trauma Registry

SJRMC uses the Lancet Trauma One™ software. This choice was made several years ago by the TPM, based upon past software experience at another trauma center. Data collection began in July 2006, and the Trauma Registrar, a 1.0 FTE position, is current in data entry. Registry patients are identified by the registrar using the computerized ED database, where all trauma activations are tagged for easy identification. The National Trauma Data Bank (NTDB) inclusion criteria are used to define the trauma patient population. The NTDB data dictionary is used, and data have been submitted to the NTDB.

The trauma registry included 512 patients for the ten month period of January 1 through October 31, 2009. Of this total, 278 patients were admitted, 195 were discharged home from the ED, 25 were transferred out, 11 were deaths, and 3 signed out against medical advice. Data supplied by the hospital on all patients discharged for 2009 with ICD9 injury codes identified 866 injury admissions. Blunt trauma accounts for 84% of patients, 14% have penetrating trauma, and 2% have burns or other trauma.

The registrar is adept in the use of the various capabilities of Lancet Trauma One™. Several sophisticated reports were provided in the pre-review documentation. The registrar is also assigned the responsibility for taking and transcribing minutes of the trauma multidisciplinary and PI meetings, and minutes are detailed for both meetings.

Trauma Performance Improvement Program

Identification of trauma PI issues can occur in one of several ways, including: the trauma registrar, rounds on inpatients, referral from another department, or chart review by the TPM. All deaths, pediatric cases, and transfers out are reviewed by the TPM. Issues identified are documented and discussed with the TMD to determine if they should be presented at the committee meetings or addressed directly by the TMD. The hospital Quality Management Department integrates the trauma PI efforts into the hospital quality management program. Trauma PI becomes part of the Department of Surgery PI, which is then forwarded to the Medical Executive Committee.

The Trauma Multidisciplinary Committee meets once to twice monthly, followed by the Trauma Peer Review Committee meeting. The ED Through-put Committee meets before these meetings, to encourage attendance at all three. Representatives of specialty services and hospital programs related to trauma attend the Multidisciplinary Committee meetings and trauma surgeons have a 50% attendance requirement at the Peer Review meetings.

Trauma PI Projects

Physician response times by activation tier are tracked and reported by the trauma registry. A list of approximately 23 issues that were addressed and resolved by the trauma PI program was provided to the SVT. Extensive work has been done by the hospital's High Impact Teams on ED patient through-put. Successful trauma PI projects have included the development of the Massive Transfusion Protocol and the use of coolers to provide predefined sets of blood products to the clinicians, obtaining dedicated neurosurgery and trauma surgery call, and requiring current ATLS certification for trauma surgeons. ED physician time out of ED for in-house emergencies is not tracked, nor is concurrent trauma activations during those times of absence. This monitoring will be a requirement for level II verification.

SJRMC has hired an experienced trauma medical director as a consultant for its trauma PI program. This consultant attends PI meetings, does case reviews, and in conjunction with the TMD works to provide an intense focus on trauma PI.

St. John's Regional Medical Center Summary Findings

Overall, SJRMC shows strong administrative and adequate physician staff commitment to the trauma program. The hospital has been operating as a de-facto trauma center for several years, seeing a significant percentage of penetrating trauma. The hospital currently maintains a staffed OR for trauma at

all times. Trauma surgeon coverage is provided by the dedicated TMD, the previous interim TMD who is nearing retirement, newly hired trauma surgeons and a small number of current SJRMC general surgeons. As reported by the TMD, the call panel has been supplemented by the use of per-diem coverage by trauma surgeons from other centers. The surgeons on the call panel have good trauma training and expertise; however, full coverage by the current panel had not yet been fully implemented at the time of the visit. Long-term sustainability of the coverage model has not been demonstrated Neurosurgical coverage is adequate based upon PI records, but it is provided by only two neurosurgeons. The SVT does not believe that this situation is viable in the long term, especially if patient volume or intensity increase. Orthopedic services are well covered, including provision of a dedicated OR for urgent orthopedic cases. SJRMC has a significant reliance upon call stipends, comparable to many similar trauma programs in other areas. Some areas of specialty coverage, including IR are not yet fully in place. The hospital has very limited pediatric resources, and no immediate plans to develop them.

The physical plant meets current standards and is adequate for projected volume. A capacity to expand is possible with build-out of currently unfinished space. Current CT scanning capability is adequate, but not ideal. Trauma program clinical direction and the trauma PI process are strong, though primarily driven by the TMD and TPM. Full implementation of the planned trauma program has been in place for only a short time, so clinical experience is limited. The TPM and TMD both have good experience in their roles, and appropriate external expertise has been sought and used in the establishment of the trauma program.

Outreach programs are in place though not fully mature. The injury prevention program is already strong for a center of this size. The hospital also has a strong education program, both for in-house providers and for prehospital providers. In the balance, SJRMC clearly has the resources and commitment to achieve verification as a level II trauma center, but long-term viability of neurosurgical coverage under the current two neurosurgeon model is doubtful, and trauma call coverage relies on external per-diem resources. Most of the necessary trauma program infrastructure is in place and good organization is demonstrated. However, given very recent implementation of full trauma surgeon coverage and other aspects of the clinical program, limited clinical data exist to document performance that meets necessary standards.

Scores from Assessment Tools

RFP Scoring   315
Benchmark, Indicator and Scoring Process   104
Weighted Aggregate Score   252
Estimated time frame for level II verification
- Unlikely within 12 months
- Probable within 18 months

Strengths
- The hospital and Catholic Health West have demonstrated strong institutional commitment, including a financial commitment for physician coverage.
- The trauma medical director is energetic and dedicated full time to the trauma program.
- The hospital has engaged ongoing external expertise for PI program development.
- The hospital maintains a dedicated OR for trauma.
- The hospital maintains a daily dedicated OR for urgent orthopedic surgery.
- The trauma registrar is well versed in use of the registry software.
- The hospital has accredited in-house rehabilitation beds.
- The hospital has marketing resources to help support public education.
- The hospital is an approved STEMI center, and this has provided an understanding of regionalization for the care of time sensitive diseases.
- The hospital is a seismically sound facility with capacity to expand.

Weaknesses
- The number of neurosurgeons is too small to ensure long-term viability.
- The trauma call panel utilizes substantial resources for a center of this volume, with limited integration into the general surgery service. This system provided good trauma expertise but has been in place for a very limited time. Long term sustainability of the model has not been demonstrated.
- The hospital has very limited resources for the care of injured children.
- The trauma program has only just become fully operational, and thus lacks a clinical record in its current configuration.
- The TPM may have too many responsibilities (prehospital coordination management, case management, PI, policy development, outreach, and education) to provide necessary trauma focus if patient volume increases substantially.
- The ED physician responds to in-house emergencies at night, leaving the ED without coverage. This is not tracked by the trauma PI process, a requirement for level II verification.
- The trauma program lacks IR coverage.
- The age of CT equipment is not optimal.
- The trauma program lacks urology coverage.
- No fire suppression exists for the helicopter landing site.

Recommendations
- Explore ways to increase the depth of neurosurgical coverage.
- Consider ways to increase participation of the current SJRMC general surgeons in trauma call coverage, or to integrate employed trauma surgeons into the general surgery service to help ensure long-term stability.

- Increase resources for the care of pediatric patients, especially non-critical children likely to remain at SJRMC. Consider seeking certification as an Emergency Department Approved for Pediatrics (EDAP) hospital.
- Provide additional support for the TPM, such as a case manager.
- Consider increasing medical coverage in the ICU.
- Obtain urology and IR coverage.
- Monitor ED physician response for in-house emergencies through the trauma PI program.
- Interface and drill with the local fire department regarding aircraft crash response and fire suppression for helicopter pad.

Ventura County Medical Center

VCMC is a publicly-owned hospital administered by the County of Ventura, organized as part of the Ventura County Health Care Agency. The hospital is located in Ventura, and has 223 licensed beds, 200 of which are in use. The hospital has 18 total ICU beds, 16 pediatric beds, and 6 ORs. VCMC has been providing trauma care services as described in the RFP since 2000.

Trauma Service

The trauma system configuration described in the RFP had only been in place only six months at the time of the site visit, and thus patient records reviewed and PI documentation are not all reflective of anticipated results going forward. The TMD position is shared by two surgeons (1.5 FTE). The TMD is a general surgeon with residency-based training in trauma care, a long career focus on trauma care, and current ATLS certification. The co-TMD has fellowship training and added qualification in surgical critical care. Both are involved with national and regional trauma organizations. The co-management approach was reported to work well in the VCMC environment. Both the TMD and co-TMD are fully engaged and have demonstrated strong leadership. The job description for the TMD is appropriate and sufficient authority exists to fulfill the duties of the position.

The TPM position is full-time (1.0 FTE) with an appropriate job description. The current TPM is talented and engaged, with clinical and educational experience, however, she has no prior experience as a TPM. The TPM has been in the position for less than one year.

The trauma call panel consists of all general surgeons on staff at VCMC, who meet appropriate standards, including ATLS certification and CME requirements. The on-call surgeon is also responsible for emergency general surgery, with appropriate backup. Patients admitted to VCMC remain under the primary care of the admitting surgeon throughout the hospital stay. The TPM and TMD perform routine rounds on all trauma patients, assisted by a trauma mid-level provider (1.0 FTE). Through patient rounds, appropriate care and compliance with standards is assured, care is monitored and data are collected for PI purposes. The current process to promote uniformity and quality of care, regardless of admitting surgeon, appear adequate, but less than a year of actual experience with the current trauma program existed at the time of the site visit.

EMS Access and Emergency Department

Ground ambulance access to the ED is by a circular single-lane pull-through driveway. Air medical services access is by a lighted rooftop helipad. The helipad is state-approved, and secure access is assured with a locked perimeter fence. Officials reported that a rooftop fire suppression system exists, but this was not observed. No formalized plans have been developed with the local fire department for aircraft crash response or fire suppression. Patient transport from

the helipad to the ED takes approximately two to three minutes by way of a key-access elevator and then traversing the ambulance driveway.

Prior to hospital arrival, ambulances relay patient information to the ED via dedicated radio equipment. MICNs monitor these communications, provide care instructions, make triage decisions, and initiate ED and hospital-wide trauma notifications. Field audits of these calls and activations are performed, but their linkage to other aspects of the trauma PI process is unknown.

The ED has an annual patient volume of approximately 36,000. The ED has 17 beds, including a two-bed trauma resuscitation bay. Beds are separated from one another by hanging curtains. The trauma bays are used for nontrauma or nonacutely ill patients when needed. Staff reported that the bays can be freed on short notice, so this use does not affect emergency readiness. Standard resuscitation equipment and supplies for acute care and resuscitation are readily available; however, the age and useful life of some equipment (monitors, ultrasound, etc) may limit capabilities. The physical plant is quite dated and not up to current standards of design, space, or patient privacy. The aged physical plant is barely adequate, and may hamper optimal care going forward if trauma volume increases significantly.

ED staffing includes attending physicians board certified in emergency medicine and family practice (FP), as well as house officers from the FP residency program. The ED attending physician responds to in-house emergencies, which in some circumstances leaves the ED without attending coverage, but not without physician coverage due to the presence of FP house staff. ED nurses have TNCC and, ACLS, certification, and MICN capabilities. Adequate numbers and types of personnel are designated to respond to trauma activations and response time criteria are established. Compliance data for response times were unavailable because of newness of the current trauma program.

Diversion of EMS traffic and ED bed saturation are recurrent issues that require "crisis" response from hospital administration, nursing, and staff. Internal policies and procedures are in place to resolve these problems; however effective preventive processes have not been devised. Trauma patients are reportedly not diverted even when the ED is saturated.

Radiology

Radiology services for the acute care of the trauma patient include plain x-rays, CT, IR and MRI. Initial plain films are performed in the trauma bay using portable machines. Nearby radiology suites provide added plain film capability after the patient is stabilized. CT capability consists of 2 scanners (one single-slice CT, and one 16-slice CT). Both CT scanners are housed in trailers located outside and approximately 50 feet from the ED entrance. Scanning of the trauma patient requires taking the patient outside the hospital and traversing the uncovered ambulance driveway. The hospital has no permanent IR suite, rather a temporary room is set up in the OR suite, using portable equipment. Interviewed IR staff

stated that this facility is sufficient for all necessary procedures; however, it is below expected standards. MRI resources are located in an outside trailer located approximately 100 ft away from the ED entrance. The age, capacities, and location of CT, IR and MRI resources, while barely adequate, are not optimal.

Operating Room and Post-Anesthesia Care Unit

VCMC has 6 ORs, but not a dedicated trauma room. When a tier 1 activation or urgent need for a trauma OR occurs, OR personnel hold the first open room until notified by the trauma surgeon that it will not be needed. The trauma program leaders and OR personnel reported that a room can be made available expeditiously. Delay to OR is tracked by the PI process, and no identified cases of delay related to lack of OR availability have occurred, though the period of data collection is limited. Given the relatively high volume of penetrating trauma and the small number of ORs, this arrangement is barely adequate. VCMC should consider provision of a dedicated trauma OR or modification of OR turnover policies to ensure that an OR is always in transition that can be rapidly made available. Staff reported that a similar process is used on an informal basis. The OR suite is out-dated, and rooms are small compared to current standards, but they are sufficiently equipped and capable. Cardio-pulmonary bypass is not available. The PACU has 8 beds, and is appropriately equipped and staffed as needed. The PACU is rarely used to hold ICU patients, either as post-operative or as overflow.

Intensive Care Unit

The ICU has 9 beds serving both medical and surgical patients. While there is no CCU, the previous CCU is immediately adjacent, containing 9 beds that are ICU capable and used for ICU overflow as needed. The former CCU beds function as an intermediate care unit at other times. The number of active ICU beds is relatively low for the hospital volume, but it is adequate with the flex bed capacity. The ICU space is dated, somewhat cramped with older monitoring equipment, but it is sufficient for patient care needs.

Nursing staff have appropriate training and very good levels of added certification including TNCC. The staffing ratios are appropriate. The co-TMD has additional qualification in surgical critical care and serves as the ICU director. VCMC has a formal ICU service, consisting of 2 family practice residents, supervised by a group of ICU attending physicians. Two ICU attending physicians have formal ICU training, and the remaining physicians have expertise gained through clinical experience.

The ICU team conducts daily multidisciplinary rounds on all ICU patients, and patients are managed cooperatively with the primary service. Night-time ICU physician coverage is provided by a senior FP resident, with backup from the on-call team, who may either be at home or in-house. Nursing and physician staff reported that this system works well. All appropriate care modalities, including

dialysis, are available. Neurosurgical critical care is generally provided by the ICU team with input from neurosurgery.

Laboratory and Blood Bank

Clinical laboratory support services include predetermined resuscitation panels (common hematology and chemistry analyses) and blood banking. Blood products (two units PRBC) are routinely delivered to the ED for the most acute trauma activations with additional products available upon request. Policies and procedures for massive transfusion are also in place. Adequate products (PRBC, FFP, platelets, cryoprecipitate, factor VIIa) are available with additional products accessible from a commercial blood center located 30 minutes away. Turnaround times for laboratory tests and blood products are tracked and processes are in place for PI.

Specialty Services

With recent hiring, three neurosurgeons provide call coverage at VCMC. Before the third neurosurgeon was hired, a neurosurgeon from another facility accepting trauma patients served as a part-time participant in the call panel. Neurosurgical call will be covered exclusively by VCMC neurosurgeons going forward. The frequency of operative intervention is low, and response times are reported to be good. Management of TBI, both operative and non-operative, is conducted cooperatively by the neurosurgeon and the ICU team. The neurosurgical representative stated full support for the trauma program; however the long-term viability of call coverage by only three neurosurgeons is a concern. It is possible that additional neurosurgical resources will be required for long-term maintenance of level II verification.

The panel of orthopedic surgeons covering trauma is sufficient, including one who performs complex pelvic and acetabular fractures, so few of these patients are transferred out. VCMC provides daily dedicated OR time for urgent orthopedic cases. The orthopedic representative stated full support for the trauma program, expressing that the current structure is both functional and sustainable.

VCMC has 16 pediatric inpatient beds, and is in the process of building and staffing a pediatric ICU, which will be the only such unit in the county. While the pediatric census is at a fairly low average, pediatric specialty coverage includes faculty and house staff from the FP residency program. The ED has appropriate equipment for the resuscitation of injured children.

Outreach and Injury Prevention

Requests from community physicians and community hospitals for consultation or interfacility transfer are responded to by the trauma surgeon on-call. The documentation of the on-call surgeon is reviewed and compared to the case after transfer for appropriateness of advice. No formal mechanism exists to provide feedback to the referring facility or physician. Because of its association with the

VCHA, the hospital is an integral part of the county's system of outpatient clinics. This network association is extremely valuable in facilitating follow-up for injured patients, especially those with limited resources. Because of this association, VCMC is currently reported to provide a disproportionate share of follow-up services to injured patients within the county.

Outreach to the general public includes a partnership with the Red Cross to offer first and cardiopulmonary resuscitation classes. The facility is actively engaged and partners with several injury prevention organizations, and a good mix of injury mechanisms and age groups are addressed.

Education and Training

The hospital has an extensive education schedule of trauma topics for staff physicians. All of these education opportunities are open to community physicians and prehospital care providers. All ED nurses are required to have current TNCC, ACLS, and Emergency Nursing Pediatric Course (ENPC) or PALS course completion. ICU nurses are also encouraged to take TNCC and ENPC. Prehospital care providers are offered continuing medical education and a skills lab for paramedics is provided. The facility is an approved provider of clinical training for the Ventura County Paramedic Program. The TMD and co-TMD hope to develop and offer a county-wide multidisciplinary trauma education conference in the future. The CATN is also desired by the ED and ICU nurses.

Trauma Registry

Lancet Trauma One™ software was selected for the trauma registry, to be consistent with the software used by the county's other trauma receiving hospitals and because of the vendor's positive reputation and training support. Data collection began in 2008, and is managed by the trauma registrar, a 1.0 FTE position. The registry is, for the most part, current with data entry. Registry patients are identified using the ED log, through patient rounds, and from charts flagged by the Medical Records Department. Inclusion criteria match the Tier 1, 2, and 3 activation criteria. Isolated hip and supracondylar fractures are registry exclusions.

The registry has 593 patients for 2009. Data provided by the hospital based on ICD9 injury codes identified 666 injury admissions during a similar period.

The hospital is working to develop a data download process for 40 to 50 fields from existing hospital databases to the trauma registry. The nurse practitioner provides concurrent data on patient complications, consultations, and procedures to the registrar. Registry data are used to direct injury prevention efforts. The registrar and TPM are still learning the full capabilities of Trauma One™; however, they were able to produce the reports and data requested albeit in a basic format. No examples of reports routinely presented to the trauma committees were provided to the SVT in the pre-review documents or on-site.

<u>Trauma Performance Improvement Program</u>

Identification of trauma PI issues can occur in several ways, including: daily rounds, registry chart review, the PI assessment tool, the nurse practitioner or liaisons from other services, or weekly PI intake rounds. About 20 PI parameters are tracked and trended at a time, using registry data. A full list of PI filters was included in the application, as was an extensive 5-page trauma PI review form.

The multidisciplinary Trauma Operational Process Performance Committee (TOPP) meets every other month, followed by the Trauma Morbidity and Mortality Committee. Representatives of specialty services and hospital programs related to trauma attend the TOPP meetings and a 50% attendance requirement at both meetings exists for the trauma surgeons and physician liaisons. The morbidity and mortality meeting discusses deaths, complications, transfers, care issues, and unexpected returns to the OR. The TMDs dictate summaries of the discussion, and documentation flows through the Department of Surgery PI Committee to the Medical Executive Committee. The morbidity and mortality meeting is open to residents, community physicians, nurses, and prehospital personnel. The TPM reports to the hospital PI Committee for the trauma PI program. The trauma PI process receives peer review protection from the hospital's peer review process.

Strong support for the VCMC trauma program was reported from the Medical Examiner's office, also a county program. The TMDs or designees may attend autopsies or consult with the medical examiners as needed. A 100% trauma death autopsy rate was reported.

<u>Trauma PI Projects</u>

Examples of improvements made through the PI process include the addition of a Broselow Cart™ for pediatric care, adding drowning to the list of trauma activation criteria, creation of a public education program on pool safety, and moving the alcohol Screening and Brief Intervention program from social services to the trauma program to increase the percentage of patients reached. A second warmer for FFP was purchased on recommendation from the PI committee. A hospital-wide project that created urgent care centers in the county succeeded in decreasing ED visits by 50%.

Ventura County Medical Center Summary Findings

Overall, VCMC shows strong administrative and strong physician commitment to the trauma program. The hospital has functioned as a de-facto trauma center for several years and treats a significant percentage of penetrating trauma. The hospital is an integral part of the overall Ventura County health system, including the integration with a large network of community health resources. Trauma care appears to be a priority of the entire medical staff, and trauma call coverage is provided by the full group of general surgeons on staff at VCMC. Neurosurgical coverage is adequate based upon PI records, but is provided by only 3 neurosurgeons. This situation is felt by current neurosurgical staff to be viable in

the long term, and the program was able to recruit a new neurosurgeon. Nevertheless, the limited depth of the neurosurgical call panel has the potential to be problematic in the long term. Orthopedics appears to be well covered, including provision of a dedicated OR for urgent orthopedic cases. The hospital is working to establish a pediatric ICU, and it has the strongest pediatric resources in the county. The physical plant, including the ED, OR, IR and ICU, is out of date and not up to current standards. The current facilities are barely adequate in all areas. VCMC has long-term plans for renovations, but these are several years away. CT scanning capability (one 16-slice scanner and one 1-slice scanner, both located in trailer) is adequate but not ideal. The hospital is in the process of acquisition and installation of a 64-slice scanner, planned within the next 1-2 years.

Trauma program clinical leadership and the trauma PI process are strong. Full implementation of the trauma program under current leadership has been in place for less than a year, so there is limited clinical experience. Both the TMD and co-TMD have good experience in their roles, and the trauma program leaders have also used external expertise in the refinement of the trauma program.

The presence of the FP residency program adds depth to physician coverage, both at the attending and the house staff level, manifested in the existence of a full-time surgical ICU team, stronger pediatric resources, and deeper physician coverage in the ED. The outreach program is fairly well developed and the injury prevention program strong. The hospital has a strong education program, both for in-house providers and for prehospital providers.

On balance, VCMC clearly has the resources and commitment to achieve verification as a level II trauma center. VCMC has both the strongest ties to outpatient clinical services and the strongest commitment to pediatric care. The aging physical plant is a significant liability, though patient record review and staff input both suggest that it has no impact on current patient care. The facilities need to be brought up to date, and VCMC has intermediate and long range plans in place to do so. Neurosurgical coverage appears adequate, but it is by no means deep. Most of the necessary trauma program infrastructure is already in place, and shows good organization. However, with the recent changes in the clinical program, limited clinical data are available to document performance.

Scores from Assessment Tools

RFP Scoring	336
Benchmark, Indicator and Scoring Process	101
Weighted Aggregate Score	266

Estimated time frame for Level II verification
- Possible within 12 months
- Probable within 18 months

Strengths

- VCMC has strong institutional and staff commitment.
- The hospital has the longest track record in providing trauma care with full coverage.
- VCMC is an integral part of the larger Ventura County health care system.
- The hospital has the best current pediatric resources and plans to develop pediatric intensive care capacity.
- The shared leadership of two trauma medical directors has resulted in strong and effective leadership.
- A dedicated OR is available for urgent orthopedic cases.
- The hospital has a full time injury prevention coordinator.
- The trauma program has a good interface with the medical examiner, and the trauma autopsy rate is high.
- A dedicated trauma nurse practitioner provides additional depth to the clinical service.
- The family practice residency program provides depth of clinical and educational resources.
- VCMC has a full time surgical ICU team

Weaknesses

- The physical plant is aged and not up to current standards.
- Services are relatively distant from each other.
- No permanent IR facilities exist.
- The age of CT equipment and location outside of the hospital building is not optimal.
- The hospital has no thoracic surgeon and no cardio-pulmonary bypass capability.
- The number of neurosurgeons is limited to cover call long term.
- The trauma program has not been provided with administrative support.
- The helipad has an exhaust problem, and the hospital has not collaborated with the local fire department for response to an aircraft crash or fire.

Recommendations

- Commit to making upgrades to the existing physical plant, especially ED, OR, and ICU, an urgent priority.
- Upgrade CT capacity, and locate a CT scanner in permanent space in close proximity to the ED.
- Establish permanent IR facilities.
- Continue to develop pediatric intensive care unit capability.
- Consider seeking Emergency Department Approved for Pediatrics (EDAP) certification.
- Expand and refine existing relationships with public health.
- Explore ways increase the depth of neurosurgical coverage.

- Consider hiring a thoracic surgeon or establish a strong call coverage relationship with external thoracic surgeons.
- Obtain dedicated administrative support for the trauma program.
- During construction, consider ways to relocate the helipad to mitigate exhaust problems.
- Interface with the local fire department regarding aircraft crash response and fire suppression for the helicopter pad.

Overall Summary of Conclusions

Ventura County is fortunate to have three hospitals with the resources, dedication, and willingness to pursue designation as level II trauma centers. The two western hospitals, SJRMC and VCMC, are closely matched in broad terms and the degree of preparation. The trauma program infrastructure and resource commitment in these two hospitals is generally higher than that in the eastern applicant, LRRMC. This may reflect the competitive nature of the RFP for the western hospitals, the generally higher level of injury acuity, and the higher prevalence of penetrating trauma seen in the western part of the county.

As requested, LRRMC was evaluated on a pass/fail basis and was determined to have passed. In comparing the two western hospitals, VCMC scored slightly higher on the aggregate tool (266 to 252), and it was the unanimous overall choice of the SVT by a similarly narrow margin. On closer inspection however, the VCMC and SJRMC are not similarly balanced. Each possesses a unique set of strengths and weaknesses that would make it difficult for either to serve as the sole designated trauma hospital without the resources of the other. Major structural and programmatic changes would be required by either western hospital to enable it to function as the sole designated trauma center and to provide the level of service that the two hospitals can provide together. Moreover, failure to designate any one of the three applicant hospitals would likely result in a dismantling of current trauma infrastructure in that hospital, and thus a decrease in the overall resources available for trauma care within the county.

The existing trauma plan calls for designation of two trauma centers within the county, a decision based largely upon the recommendation of an outside consultant's report. This report suggested that a maximum of two trauma centers would provide sufficient volume to remain financially viable. However, a review of financial data supplied by the applicant hospitals, as well as extensive interviews with staff and hospital administration, suggested that this finding is likely inaccurate. Current registry data and review of hospital discharge data suggest that all three applicant hospitals currently see a volume of trauma patients that is consistent with designated level II trauma centers in other parts of the country. The population of Ventura County is sufficient to allow designation of three level II centers under California law. Each applicant hospital reported that their financial model suggests that a trauma program is viable at its current patient volume. In any case, trauma will remain a fairly small percentage of the overall patient volume at any hospital in Ventura County, and it is unlikely to be an unbearable financial burden even in the worst case scenario. Finally, each applicant hospital demonstrated strong, non-financial, commitments to pursue trauma center designation, which would ensure ongoing participation in the event of financial loss.

The availability of neurosurgical coverage is most likely the issue that could limit the number of viable level II trauma centers in Ventura County. Currently, both SJRMC and VCMC have little depth in neurosurgical coverage, and the loss of a

single neurosurgeon at either hospital could make compliance with level II standards impossible. It could be argued that if all the neurosurgeons in the western portion of the county took call at a single hospital the situation would be more robust. However, it is unlikely that the designation of a single trauma center for western Ventura County will mean that all of the neurosurgeons will practice at that designated hospital if they do not already do so. In fact, designation of one hospital may well lead to the opposite effect, where neurosurgeons choose to practice at the hospital that does not require trauma call. Therefore, designation of all applicant hospitals has the best chance of ensuring that all neurosurgical resources within the county remain engaged in trauma care.

The SVT concluded, based upon analysis of data collected, on-site assessment, and interviews during the site visit that no compelling reason exists to restrict level II trauma center designation to two hospitals. The trauma system as a whole will be stronger if all three applicant hospitals are designated. The advantages of preserving current resources and increasing surge capacity, along with potential for inter-hospital cooperation for the optimal provision of scarce resources, outweigh potential risks associated with the designation of all three hospitals. Therefore, the SVT recommends that all three applicant hospitals be designated as level II trauma centers, contingent upon their ongoing ability to achieve and maintain verification through the ACS COT.

Key Findings

- All three applicant hospitals demonstrated a strong commitment to the care of injured patients, and to the achievement and maintenance of trauma center designation standards. This commitment is a valuable resource for the people of Ventura County.
- The SVT does not believe that any of the three applicant hospitals has a high probability of achieving ACS verification as a level II trauma center within the next six months.
- With targeted technical assistance, Los Robles Hospital and Medical Center in the east should be able to achieve ACS verification as a level II trauma center within two years.
- Both western hospitals, St. John's Regional Medical Center and Ventura County Medical Center, should be ready for an ACS level II verification visit within 12-18 months.
- Ventura County Medical Center scored marginally higher overall than did St. John's Regional Medical Center using the assessment tools and in the unanimous opinion of the SVT.
- St. John's Medical Center and Ventura County Medical Center each have unique strengths and weaknesses. Without major structural changes, neither facility appears capable of reliably functioning as the only designated trauma center in the western region.
- Given the dedication of the administration and health professionals of all three hospitals, and the complementary strengths of the individual

facilities, it is the opinion of the SVT that injured patients in Ventura County will be best served by designation of all three applicant hospitals, assuming they all achieve and maintain designation standards.

- The current and projected volume of injured patients at each applicant hospital appears sufficient to sustain three designated trauma centers. The advantages gained from system redundancy and surge capacity likely outweigh disadvantages related to low trauma center volume.
- In the future, a reduction in the number of designated trauma centers may result from shortages in critical specialty coverage, especially neurosurgery, which at the present time is barely adequate in two out of three facilities.

Acronyms

ACLS – Advanced Cardiac Life Support
ACS – American College of Surgeons
ATLS – Advanced Trauma Life Support

CA – California
CATV – Course in Advanced Trauma Nursing
CCU – coronary care unit
CME – continuing medical education
COT – Committee on Trauma
CT – computerized tomography

DVT – deep vein thrombosis

ED – emergency department
EDAP – emergency department approved for pediatrics
EM – emergency medicine
EMS – emergency medical services
ENPC – Emergency Nursing Pediatric Course

FFP – fresh frozen plasma
FP – family practice
FTE – full time equivalent

ICD9 – International Classification of Diseases, 9th edition
ICU – intensive care unit
IR – interventional radiology

LRRMC – Los Robles Regional Medical Center

MICN – mobile intensive care nurse
MRI – magnetic resonance imaging
MTP – mass transfusion protocol

NTDB – National Trauma Data Bank

OR – operating room

PACU – post-anesthesia care unit
PALS – Pediatric Advanced Life Support
PRBC – packed red blood cells
PI – performance improvement

RFP – request for proposal

SJRMC – St. John's Regional Medical Center
STEMI – ST elevation myocardial infarction
SVT – site visit team

TBI – traumatic brain injury
TMD – trauma medical director
TNCC – Trauma Nurse Core Curriculum
TOPP – trauma operational process performance
TPM – trauma program manager
TSC – trauma system consultation
TSEPC – Trauma System Evaluation and Planning Committee

VCEMSA – Ventura County Emergency Medical Services Agency
VCHA – Ventura County Health Agency

Appendix A: ACS Consultation Review Team Biological Sketches

ROBERT J. WINCHELL, MD, FACS- TEAM LEADER

Dr. Robert Winchell is currently the head of the Division of Trauma and Burn Surgery at the Maine Medical Center and Associate Clinical Professor of Surgery at the University of Vermont School of Medicine. Dr. Winchell received his undergraduate degree from the California Institute of Technology and his M.D. from Yale University. He did his internship, General Surgery residency, and Trauma and Critical Care Fellowship at the University of California, San Diego, where he remained on the faculty as Associate Professor of Clinical Surgery in the Division of Trauma through 1999. After leaving the University of California, Dr. Winchell established and subsequently directed the Tacoma Trauma Center in Tacoma, Washington, a successful new trauma center operated as a joint venture between two previously competing hospitals. Dr. Winchell moved to the Maine Medical Center in 2001 and assumed his current post in 2004.

Dr. Winchell has been involved in trauma center and trauma system design and operation throughout his career, in a wide variety of settings covering the spectrum of system development. He was involved with both the day-to-day operations and ongoing development of the San Diego County trauma system for over ten years and served as chair of the San Diego and Imperial County Committee on Trauma. He participated in operation and ongoing development of the Washington state trauma system, serving on the state advisory board, and as chair of the Southwest EMS region. Since coming to Maine, Dr. Winchell has worked to develop the Maine state system, is a member of the state advisory board, and is currently the chairman of the Maine State Committee on Trauma. Dr. Winchell is Vice-Chair of the Trauma Systems Evaluation and Planning Committee of the American College of Surgeons and also serves as a site reviewer for the trauma center verification program of the College.

Dr. Winchell is Board certified in General Surgery, with added qualifications in Surgical Critical Care. Dr. Winchell is a Fellow of the American College of Surgeons as well as a member of the American Association for the Surgery of Trauma, the Association for Academic Surgery, the Southwest Surgical Congress, and the Society of Critical Care Medicine. He is author of more than 40 scientific papers and book chapters, and has given over 100 regional, national, and international presentations.

JANE W. BALL, RN, DRPH

Dr. Jane W. Ball served as the Director of the National Resource Center (NRC) at the Children's National Medical Center in Washington, D.C. from 1991 through 2006. The NRC provided support to two Federal Programs in the U. S. Department of Health and Human Services' Health Services and Resources Administration (HRSA): the Emergency Medical Services for Children (EMSC) Program and the Trauma-Emergency Medical Services Systems Program. As director of the NRC, she coordinated the support provided to the Federal Program Directors as well as the provision of technical assistance to state grantees. Support to the Federal Program Directors often included meeting

facilitation, preparation of special reports (such as the *Model Trauma Systems Evaluation and Planning* document), and consultation on Program issues. Technical assistance often included strategic planning, providing guidance in securing funding, developing and implementing grants, developing injury prevention plans and programs, building coalitions, shaping public policy, conducting training, and producing educational resource materials.

Dr. Ball has authored numerous articles and publications as well as several health care textbooks, including Mosby's Guide to Physical Examination (7 editions), Child Health Nursing (2 editions), Pediatric Nursing: Caring for Children (4 editions), Maternal and Child Nursing (2 editions), and Pediatric Emergencies: A Manual for Prehospital Care Providers (2 editions). One of these texts, Pediatric Nursing: Caring for Children, received the1999 and 2001 Robert Wood Johnson Foundation Last Acts Coalition Outstanding Specialty Book Award. As an expert in the emergency care of children, Dr. Ball has frequently been invited to join committees and professional groups that address the unique needs of children.

Dr. Ball recently completed her term as the President and Immediate Past President of the National Academies of Practice, an organization composed of distinguished health care practitioners from 10 disciplines that promote education, research, and public policy related to improving the quality of health care for all through interdisciplinary care.

Dr. Ball graduated from the Johns Hopkins Hospital School of Nursing. She obtained her master's degree and doctorate in Public Health from John Hopkins University School of Hygiene and Public Health. She is a Certified Pediatric Nurse Practitioner.

MARY SUE JONES, RN, MS

Mary Sue Jones has been Delaware's State Trauma System Coordinator since 1996, and was the Associate Trauma System Coordinator for 2 years prior. She was a hospital Trauma Coordinator at a Level 2 Trauma Center in Pennsylvania for 4 years, during the time when the Pennsylvania Trauma System was beginning. She worked as an RN in the Admitting Area of Maryland's R Adams Cowley Shock Trauma Center, and also taught in a paramedic educational program. Previous clinical experience includes surgical ICU, ED nurse manager, and 3-11 shift supervisor. Her Master's degree is in Human Resources Management, her undergraduate in psychology with emphasis on organizational psychology. She is a diploma nursing graduate of the school of nursing at Lankenau Hospital, Philadelphia PA. Delaware's Statewide Trauma System is a voluntary inclusive system that has demonstrated a significant decrease in the mortality rate of the most seriously injured transported to Delaware Trauma Centers, those with an Injury Severity Score over 24. In 1998 the mortality rate for this group was 45.7%, and in 2007 the rate was 20.5%.

Mary Sue's injury prevention role began in 2004 when the Delaware Division of Public Health's injury prevention program became her responsibility. Since that time the Delaware Coalition for Injury Prevention has grown to include representatives from 37 agencies and has developed successful projects such as the Injury Prevention Online Certification Course in partnership with the University of Delaware, the Senior Aquatic Exercise Falls Prevention program, the 19802 and 19933 Community Injury and Violence Prevention projects, and the Traumatic Brain Injury Prevention Media Contest program for high school students--- despite lack of dedicated funding for this program. In addition, Coalition for Injury Prevention projects have been accepted as poster presentations by STIPDA at past annual meetings and have won first place the last two years in the Delaware Trauma Symposium's poster presentation contest.

KATHY J. RINNERT, MD, MPH

Kathy J. Rinnert, MD, M.P.H., began her career in emergency medicine and emergency medical services (EMS) in the early 1980's as a Nationally Registered Paramedic in a five-county, rural EMS agency in the Allegheny Mountains of Southeast Ohio. She completed medical school at the Ohio State University, followed by an internship in Internal Medicine at Loyola University, and residency training in Emergency Medicine at the University of Chicago. Following residency, Dr. Rinnert completed a two-year fellowship in EMS at the University of Pittsburgh. She simultaneously obtained a Master's in Public Health at the Graduate School during her tenure in Pittsburgh.

Dr. Rinnert currently serves as Associate Professor in Emergency Medicine at the University of Texas Southwestern Medical Center at Dallas (UTSWMC). In addition, she is the Associate Medical Director for the UTSW/BioTel EMS system, encompassing sixteen municipalities and their fire-based EMS and Public Safety agencies. In this capacity, she oversees the out-of-hospital practice of over 1700 paramedics operating in urban, suburban, and rural environments. Dr. Rinnert directs the Center for Government Emergency Medical Security Services (GEMSS) at the UTSWMC, which provides academic and clinical tactical support to government agencies. At the Center she directs both the EMS and GEMSS fellowship programs, which provide post-doctoral training in these subspecialty areas of emergency medicine.

Dr. Rinnert has special interest and expertise in trauma, injury prevention and control, air medical transport, tactical EMS, urban search and rescue, and domestic preparedness for weapons of mass effect (WME) and counterterrorism. She serves as the Chairman and medical representative on the Panel of Commissioners (POC) for the Commission on Accreditation of Ambulance Services (CAAS), the national body for accreditation of EMS agencies in the United States and Canada. In addition, Dr Rinnert is an active site reviewer for the Committee on Accreditation of Educational Programs for the EMS Professions (CoAEMSP) and trauma systems consultant to the American College of Surgeons Committee on Trauma (ACS-COT). Dr. Rinnert was recently

elected to the Board of Directors of the National Association of EMS Physicians, the premier organization for physician practice in EMS.

NELS D. SANDDAL, MS, REMT-B

Mr. Sanddal is currently the president of the Critical Illness and Trauma Foundation (CIT), in Bozeman, Montana. CIT is a non-profit organization dedicated to improving the outcomes of people who are injured in rural America through programs of prevention, training, and research. He recently completed a detachment as the Director of the Rural EMS and Trauma Technical Assistance Center which was funded by the Department of Health and Human Services, Health Resources and Services Administration. Mr. Sanddal worked as the training coordinator for the EMS and Injury Prevention Section of the Montana Department of Public Health and Human Services in the late 1970's. He has served as the Chairperson of the National Council of State EMS Training Coordinators and as the lead staff member for that organization, as well as the National Association of EMT.

Mr. Sanddal has been a co-investigator for six state or regional rural preventable trauma mortality studies and has conducted research in the area of training for prehospital and nursing personnel as well as in rural injury prevention and control. He is a core faculty member for the NHTSA Development of Trauma Systems course and has conducted several statewide EMS assessments for NHTSA. Mr. Sanddal served on the IOM Committee on the Future of Emergency Care in the U.S.

He received his EMT training in Boulder, Montana in 1973 and has been an active EMT with numerous volunteer ambulance services since that time. He currently responds with the Gallatin River Ranch Volunteer Fire Department where he serves as the Medical Officer and Assistant Chief.

He completed his undergraduate work at Carroll College, received his Master's degree in psychology from Montana State University and is currently completing his doctorate in Health and Human Behavior from Walden University.

Appendix B: Consultation Agenda

Sunday, January 10th			
Time	**Home Team**	**Time**	**Field Team**
	Nels Sanddal, Jane Ball, Holly Michaels		**Dr. Winchell, Dr. Rinnert, Mary Sue Jones, RN**
Travel			
2:00-3:00 p.m.	Afternoon Team Meeting	2:00-3:00 p.m.	Afternoon Team Meeting
3:00-4:00 p.m.	Orientation and Expectation with Ventura County Staff	3:00-4:00 p.m.	Orientation and Expectation with Ventura County Staff
4:00-6:00 p.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from Los Robles Hospital and Medical Center	4:00-6:00 p.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from Los Robles Hospital and Medical Center
7:00-9:00 p.m.	Dinner and Day 2 strategy session (Team Members Only)	7:00-9:00 p.m.	

Monday, January 11th			
Time	Home Team	Time	Field Team
7:15-8:00 a.m.	Full Team Breakfast Meeting	7:15-8:00 a.m.	Full Team Breakfast Meeting
8:00-9:00 a.m.	Home Team Meeting	8:00-9:00 a.m.	Hospital Team (Winchell, Rinnert, and Jones) to Los Robles (≈ 30 Miles)
9:00-11:00a.m.	Additional discussion with County Reps and Community Stakeholders	9:00-12:00 p.m.	Site Survey – Los Robles Hospital and Medical Center Chart Review- 1.5 hrs. Walk Around- 1.5 hrs.
11:00-12:00 p.m.	Begin Writing County Overview and Los Robles Overview		
12:00-12:30 p.m.	Travel to St Johns (≈ 6 Miles)	12:00-12:30 p.m.	Travel to St Johns (≈ 25 Miles)
12:30-1:00 p.m.	Speed Debrief and Lunch All Team Members -Identify follow-up needs with Los Robles	12:30-1:00 p.m.	Speed Debrief and Lunch All Team Members -Identify follow-up needs with Los Robles

1:00-3:00 p.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from St. John's Regional Medical Center	1:00-3:00 p.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from St. John's Regional Medical Center
3:00-3:30 p.m.	Return to Base	3:00-6:00 p.m.	Site Survey- -1.5 hrs. Chart Review -1.5 hrs. Walk Around
4:00-6:00 p.m.	Follow-up PRN with Los Robles Representatives	7:00-7:30 p.m.	Travel back to base.
6:00-7:30 p.m.	Consolidate Notes and Findings		
8:00-9:30 p.m.	Dinner (in meeting room) Debrief and Findings	8:00-9:30 p.m.	Dinner (in meeting room) Debrief and Findings

Tuesday, January 12th			
Time	**Home Team**	**Time**	**Field Team**
7:30 – 8:00 a.m.	Full Team Breakfast Strategy for Day 3	7:30 – 8:00 a.m.	Full Team Breakfast Strategy for Day 3
8:00-8:30 a.m.	Full Team travel to Ventura County Medical Center ($\approx$ 5 Miles)	8:00-8:30 a.m.	Full Team travel to Ventura County Medical Center ($\approx$ 5 Miles)
8:30-10:30 a.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from Ventura County Medical Center	8:30-10:30 a.m.	Facility and PRQ overview by staff (trauma medical director, trauma program manager, ED physician, quality improvement coordinator, administration) from Ventura County Medical Center
10:30-11:00a.m.	Return to home base	10:30-2:00 p.m.	- 1.5 hrs. Chart Review - .5 hrs. lunch - 1.5 hrs. Walk Around

11:00-1:00p.m.	Follow-Up with St. John's Staff		
1:00-1:30p.m.	Lunch		
1:30-3:30 p.m.	Writing Overview of St. John's		
3:30-4:30 p.m.	All Team Debrief	3:30-4:30 p.m.	All Team Debrief
4:30-6:30 p.m.	Additional Follow-up with Ventura County Reps	4:30-6:30 p.m.	Review Home Team Drafts and Begin Writing Other Sections
7:00-9:00 p.m.	Dinner and Debrief (Full Team)	7:00-9:00 p.m.	Dinner and Debrief (Full Team)

Wednesday, January 13th			
Time	**Home Team**	**Time**	**Field Team**
8:00-9:00 a.m.	Finalize Strengths and Weaknesses by Facility and System	8:00-9:00 a.m.	Finalize Strengths and Weaknesses by Facility and System
9:00-10:00 a.m.	Draft and Consensus on Recommendations	9:00-10:00 a.m.	Draft and Consensus on Recommendations
10:00-2:00 p.m.	Draft Report	10:00-2:00 p.m.	Draft Report
2:00-3:00 p.m.	Exit Interview	2:00-3:00 p.m.	Exit Interview
As Practical Midwest and West Coast Participants Travel Home East Coast Team moves to airport hotel.		As Practical Midwest and West Coast Participants Travel Home East Coast Team moves to airport hotel.	
Thursday, January 14th			
Early travel home for Midwest and East Coast team members			

Appendix C: Assessment Tools

RFP Scoring System for Ventura County Hospital Applicants- Tool 1

		1	2	3	4
4.1	**Operational Description Of Hospital**	**Not Addressed**	**Partially Addressed: Inadequate description/ documentation**	**Fully Addressed: Adequate description/ documentation**	**Fully Addressed: Excellent description/ documentation**
4.1.1	a. Hospital ownership; if incorporated, the state in which the company is incorporated and the date of incorporation. b. Location of the company offices. c. Location of the office servicing any California account(s). d. Number of employees both locally and nationally. e. Length of time PROPOSER has been providing services described in this RFP. Please provide a brief description. f. Any alleged significant prior or ongoing contract failures, any civil or criminal litigation or investigation pending which involves the Proposer or in which the PROPOSER has been judged guilty or liable. g. Provide the current financial statement or latest annual report. Make a definitive statement regarding their financial ability to perform the requirements hereunder				

4.1.2	a. Describe and compare the hospital facility and capability, against the Ventura Trauma Standards (contained in Appendix 5 of this RFP).				
	b. Discuss the major access routes to the hospital, and identify the perimeter of twenty (20), and sixty (60) minutes surface travel time along these major routes during non-peak travel time.				
	c. Provide:				
	Note: Resources provided on a separate campus in response to 4.1.2, must be clearly identified as a second campus.[16]				
	1. Total licensed beds				
	2. Total number and location of beds currently in use				
	3. Trauma unit beds—number and location				
	4. Emergency department beds				
	5. Critical care beds (total)				
	6. Cardiac care beds				
	7. Surgical intensive care beds				
	8. Medical intensive care beds				

	9. Pediatric intensive care beds				
	10. Other (specify)				
	11. Pediatric beds (non-intensive care)				
	12. Number of operating room suites				
	13. Number of operating room suites which are specifically dedicated to the trauma care				
	14. Description of the mechanism and authority structure that will administer the availability of critical care beds.				
	15. Description of the mechanism and authority structure that will administer the availability of operating room suites.				
	d. For the items listed in c, above, provide:				
	1. Any plans to expand within twelve (12) months.				
	2. Any plans to expand within five (5) years.				
	e. Provide monthly diversion statistics by category for the previous 12 months.				
4.1.3	Current trauma care				
	a. Describe, in detail, how the institution currently responds to the needs of major trauma victims. (Include response times during the past twelve				

	(12) months for surgery, neurosurgery, anesthesiology, laboratory, and radiology staff). b. Document currently implemented trauma policies and procedures, with copies attached, authorized by the department heads as reflected by the appropriate signatures. c. Identify those additional steps and resources which the facility will undertake/commit if designated as a trauma center. d. If the applicant has undergone a verification/consultation review related to trauma care by the American College of Surgeons summarize the findings of that report(s) (emphasizing any recommendations made) and changes made since the review. *ATTACH A COPY OF THE REPORT(S).*			
4.1.4	Clinical laboratory (As it applies to the emergency department and the trauma service):			
	a. Does the facility have ready access to, and perform, all clinical lab procedures in the hospital? b. Must certain procedures be done at a facility outside of the hospital? If so, explain fully. c. Are there pre-established protocols for drawing and performing a standard set of diagnostic tests (e.g.:			

	blood, blood gases, blood chemistry, urine, etc.)?			
	IF SO, PLEASE ATTACH A COMPLETE SET AS AN EXHIBIT.			
	If these protocols limit who is permitted to perform these procedures, identify these limits and how they impact response to trauma patients.			
	d. What is the current expected time (based on policy) and the actual average time from the request for lab tests to the drawing of the required specimen? (Identify the average time during each shift).			
	PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT VALIDATE THE ABOVE			
	e. What will be the average response time? (Identify the expected average time during each shift).			
	f. What are the average completion and reporting times for the commonly used lab tests? Specify.			
	PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT VALIDATE THE ABOVE			
4.1.5	Blood and blood products (As it applies to the emergency department and the trauma service):			

	a. Identify the expected time (based on policy) and the actual average response time for the delivery of patient specific blood products from time of request. Identify any differences among shifts which exceed fifteen (15) percent. *PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT VALIDATE THE ABOVE.* b. Describe blood banking capabilities and procedures for the procurement of large volumes of blood when necessary.				
4.1.6	Radiological services (As it applies to the emergency department and the trauma service):				
	a. Is there rapid physical access to X-ray facilities? b. Does the facility routinely use portable radiology equipment? c. What is the expected time (based on policy) and the actual average response time from request to delivered x-ray, by shift? *PROVIDE X-RAY PROTOCOLS FOR TRAUMA SERVICE REQUESTS* *PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT*				

	VALIDATE THE ABOVE.				
	d. What are the expected time (based on policy) and the actual average response times for specialized procedures, such as tomography, angiography, and ultrasound? *PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT VALIDATE THE ABOVE.*				
4.1.7	CT scanner				
	a. Does the facility have an installed full body CT scanner? b. Where is the CT scanner located in relation to the trauma receiving/resuscitation area (location, time, distance, accessibility)? c. Does the facility currently have a CT scan technician who is promptly available 24 hours per day? If no, explain. If the technician is not available in-house, describe the protocols/procedures for alerting and mobilizing the technician and for determining the appropriateness of the response time. d. As it applies to the emergency department and the trauma service, what is the average response time for interpretation of results from time of request?				

	e. CT Scanner out-of-service record:
	
	   1. How many days/hours total has the facility's CT scanner been out of service each month (list separately) for the past twelve (12) months and total outages for the 12 months for the following causes:
	   2. mechanical reasons
	
	   3. personnel reasons
	
	   4. other (explain)
	
	f. Show the average time per 24-hour period the installed CT scanner has been out of service over the past 90 days for the following :
	
	   1. mechanical reasons
	
	   2. personnel reasons
	
	   3. other (explain)
	
	g. What provisions has the hospital made to replace or backup the CT scanner when it is out of service? This plan should describe how long the hospital would be without CT scanner capability when the hospital's scanner becomes inoperable.				

4.1.8	Interventional Radiology				
	a. Does the facility have an interventional radiology				

	facility?				
	b. Does the facility currently have an interventional radiology technician who is promptly available 24 hours per day? If no, explain. If the technician is not available in-house, describe the protocols/procedures for alerting and mobilizing the technician and for determining the appropriateness of the response time.				
4.1.9	Helicopter access				
	NOTE: A helipad, is required for designation as a trauma center.				
	a. Does the facility have a FAA/CalTrans approved helicopter landing site? If yes, provide the following information. If no, go to "g", below. b. Is the facility's helicopter landing site on the same level as the trauma receiving/resuscitation area? If not, is there a designated private control elevator? c. Where is the landing site located (give distances in feet from trauma receiving/resuscitation area; describe any physical barriers or obstructions such as roadways, parking lots, fences, structures, etc. between the landing site and the entrance to the trauma receiving/resuscitation area).				

	d. Identify the average (realistic) time from the helicopter landing site to the trauma receiving/resuscitation area. Specify the time from the helicopter landing site to the elevators (if any), and the time from the elevator to the trauma receiving/resuscitation area. e. How is the patient transported to the trauma receiving/resuscitation area from the landing site (e.g.: directly via gurney, via ambulance or special vehicle)? If transport is by ambulance, document the response time to the landing site. f. Comment on ground ambulance availability (if required) and assurances of service to and from helicopter landing site. Describe the procedure to request the ambulance. g. If the facility does not have an approved helicopter landing site, does it have the ability to provide one? Are there any plans for providing an approved site? Does the facility have other temporary arrangements for receiving a trauma patient(s) transported by helicopter?				
4.1.10	Communications system				
	Describe the existing primary and backup communications systems, including:				

	a. Internal and external alerting/paging				
	b. Ground ambulance voice communications				
	c. Air ambulance and rescue helicopter voice communications				
	d. Deleted [#11]				
	e. Deleted [#11]				
	f. Protocols and procedures for use of the communications system, and persons (by title) permitted to use the communications resource.				
	g. Other communication systems required by Ventura County EMS Agency				
4.1.11	Hospital organization				
	a. Provide a complete list of members of the hospital's governing body. b. Provide an organizational chart which depicts the relationships of all departments and services. Include, as a minimum, the following services or departments: • Governing Board • Chief Executive Officer • Department of Surgery				

		• Trauma Service			
		• Department of Medicine			
		• Department of Nursing			
		• Department of Radiology			
		• Department of Pathology			
		• Department of Emergency Services			
		• Department of Pediatrics			
		• Clinical Laboratory Services			
		• Operating Room Department			
		• Department of Education			
		• Department of Rehabilitation.			
4.2	**Trauma Service**				
4.2.2	From an operational perspective, justify a designation of the facility as a trauma center.				
4.2.1	Trauma service management				
	a. Identify the individual who has been selected as trauma program medical director (chief of trauma) and provide a curriculum vitae demonstrating that				

	this individual meets the minimum standards. b. What full-time equivalency is provided for the position of trauma program medical director (chief of trauma)? c. Identify the individual who has been selected as trauma nurse coordinator/manager and provide a curriculum vitae demonstrating that this individual meets the minimum standards. d. What full-time equivalency is provided for the position of trauma nurse coordinator/manager? e. Describe the staffing pattern for provision of clerical support for the trauma program medical director (chief of trauma) and the trauma nurse coordinator/manager. f. Provide internal policies or job descriptions for the trauma program medical director (chief of trauma), trauma nurse coordinator/manager, trauma registrar, and trauma program administrative assistant.				
4.2.3	Trauma team				
	a. Discuss the make-up, strengths, and weaknesses of the trauma team at the hospital. b. Describe the protocols/procedures for alerting and				

0	mobilizing: • In-house trauma team personnel and other on-call specialists; • Trauma surgical team; • First and second surgical assistants; • Back-up trauma team(s) c. Explain whether these protocols/procedures apply on all shifts, days, weekdays, weekends, and holidays. Explain any differences which exist. d. What is the average, range, and overall response time both from in-hospital and out-of-hospital (include weekday and weekend/holiday information) over the past twelve months for the personnel listed in subsection b, above? How has this time been verified (please document response times)?				
4.2.4	Trauma receiving/resuscitation area				
	a. Describe the facility's designated trauma receiving/ resuscitation area (location, access, size, fixed and portable equipment, operation, date of construction or most recent remodeling, etc.). b. Describe how more than one critically injured trauma patient can be treated concurrently.				

4.2.5	Burns and spinal cord injury care				

	If the facility does not provide comprehensive burn and spinal cord injury treatment and rehabilitation, describe patient transfer policies, protocols and agreements for burns and spinal cord injuries.
	
	    ATTACH COPIES OF SIGNED TRANSFER
	    AGREEMENTS, WHERE APPLICABLE.				

4.3	**Trauma Registry**				
	a. Indicate the institution's commitment to participate in the operation of the trauma registry, including provision of trauma registry information to Ventura County EMS Agency. b. What full-time equivalency(ies) is provided for the position(s) of trauma registrar?				
4.4	**Physician And Nurse Coverage**				
	a. Provide an organization chart showing lines of authority for the trauma service. b. For your trauma director provide: board certification, advanced training, certification, and/or special skills in medicine, administrative services, etc. c. Complete Required Exhibit #3: Trauma Surgeons				

d. If residents will be used to provide any of the required coverage, describe the residency program.

e. Complete Required Exhibit #4: General Surgery Residents

f. Complete Required Exhibit #5: Neurosurgeons

g. Complete Required Exhibit #6: Orthopedic Surgeons

h. Complete Required Exhibit #7: Emergency Physicians

i. Complete Required Exhibit #8: Anesthesiology

j. Complete Required Exhibit #9: Radiology (Diagnostic and Interventional)

k For your trauma nurse coordinator/manager identify advanced training, certification, and/or special skills in medicine, nursing, administrative services, etc.

l For other personnel identified as part of the trauma team identify advanced training, certification, and/or special skills in medicine, nursing, administrative services, etc.

m. Document institutional policies, procedures, and audit regarding continuing education in trauma for

nurses.

n. Explain emergency physician staffing pattern over the various hours of the day (e.g., multiple physician coverage during regular high census periods).

o. Indicate the number and percentage of emergency department physicians currently American Board of Medical Specialties *(*ABMS*)* certified in emergency medicine.

p. Document institutional policies, procedures, and audit for continuing medical education for emergency department and trauma service physician staff.

 INCLUDE CME SCHEDULE FOR PAST TWELVE MONTHS.

q. Describe emergency department and ICU nursing staffing. Explain staffing relationships to acuity and methodology used (e.g. on what bases are the emergency department and ICUs staffed?).

r. Indicate the number and percentage of critical care nursing staff currently certified as ACLS providers.

s. Deleted [#5]

t. Indicate the number and percentage of critical care intensive care unit nursing staff currently Certified

Emergency Nurse (CEN) and/or Certified Critical Care Nurse (CCRN), and the number and percentage of ICU nurses who are not CCRNs.

u. Indicate the number and percentage of emergency department nursing staff currently certified as ACLS providers.

v. Indicate the number and percentage of emergency department nursing staff currently certified as CENs and/or CCRNs and the number and percentage of ED nurses who are not CENs.

w. Indicate the number and percentage of emergency department nursing staff who have completed the Emergency Nurses Association's Trauma Nurse Core Curriculum, or equivalent training.

x. Physician Back-up Policies/Procedures

    1. Explain the back-up physician/surgeon policies and procedures.
    2. Does the facility have back-up procedures beyond the second person on-call?
    3. How often is the call-in list updated?

    4. What is the percentage of compliance with call-in procedures.
        PROVIDE COPIES OF POLICIES/REPORTS/AGREEMENTS THAT VALIDATE THE ABOVE for the previous 12

	months. 5. What provision is made for non-compliance with call-in procedures (including delayed responses or failures to respond)? *PROVIDE A COPY OF THE MOST RECENT PHYSICIAN/SURGEON CALL-IN LIST*				
4.5	**Quality Improvement**				
4.5.1	a. Describe, in a narrative format, the facility's quality improvement process for trauma care services, including review of patients who are: b. Treated and admitted to the hospital; c. Treated and released; d. Treated and transferred to another medical facility; e. Treated but died in the emergency department.				
4.5.2	For each of the activities listed in 4.5.3 through 4.5.11, explain: The frequency of the activity; a. The format of the activity; b. Name/Title of the Chair c. Describe the membership using titles d. Are there attendance requirement? If yes, describe.				

	e. Committee reports to whom? *DOCUMENT POLICIES DIRECTED AT CORRECTIVE ACTION RESULTING FROM THE ACTIVITY.*				
4.5.3	Special audit for trauma deaths				
4.5.4	Morbidity and mortality conference				
4.5.5	Multidisciplinary trauma conference				
4.5.6	Trauma nursing audit				
4.5.7	Utilization review of trauma cases				
4.5.8	Medical records review of trauma cases				
4.5.9	Tissue review				
4.5.10	Disaster or multicasualty incident planning and exercises				
4.5.11	Review of cost, by diagnosis, of trauma cases				
4.5.12	Identify the person(s) responsible for coordination of the overall quality improvement activities for the trauma service; provide curriculum vitae and describe organizational relationships.				
4.6	**Outreach Program**				

4.6.1	Describe the protocol for telephone and/or on-site consultation requests from community physicians and providers in the service area. What is the specialty and training level of the physicians who will respond to these requests?				
4.6.2	What mechanisms exist or will be established to ensure the appropriateness and efficiency of the advice which is rendered?				
4.6.3	What formal mechanisms exist or will be established to provide referring hospitals or physicians with feedback (e.g., information regarding definitive diagnosis, course of treatment, patient outcome, etc.).				
4.6.4	Describe public information and education activities which are or have been conducted or sponsored regarding the following: a. How to enter the trauma system b. Use of universal emergency access number (9-1-1) c. Injury prevention d. Standard first aid e. Disaster preparedness f. Cardiopulmonary resuscitation and AED training				

	g. Problems confronting the public regarding optimal care for the injured. h. What is the training level of the person(s) responsible for public information and education activities?				
	PROVIDE SCHEDULE FOR PAST THREE MONTHS AND DESCRIBE OUTREACH EFFORTS				
4.7	**Training Program**				
4.7.1	Summarize and document formal training activities in continuing trauma education which have been provided during the past two years, providing schedules, curricula and program outlines, where available, for: a. Staff physicians b. Resident physicians c. Community physicians d. Emergency department nurses e. Surgical nurses f. Intensive care nurses g. Prehospital care personnel				

4.7.2	Indicate plans for future formal training programs in continuing trauma education for the above groups. For paramedic students and paramedics, this will include primary education and continuing education as required by Ventura County EMS Agency, including the performance of procedures on hospital patients, including insertion of intravenous catheters, endotracheal intubation, and other advanced airway devices.				
4.7.3	Provide the agreement for clinical training with the Ventura College Paramedic Program and describe, in narrative form, the manner in which paramedic students conduct their clinical training activities, to include departments and physician management.				
4.7.4	Describe institutional policies and activities for provision of continuing trauma education to physician and nursing staff at referring hospitals and prehospital care providers in the area. *PROVIDE SCHEDULE FOR PAST THREE MONTHS AND DESCRIBE TRAINING ACTIVITIES.*				
4.8	**Diversion/Saturation Policy**				
	Describe, in narrative form, the PROPOSER's policy for situations when, due to saturation (as described in Ventura County EMS Agency Policy 402) the hospital does not have appropriate resources for initial				

	treatment/stabilization. Indicate the method by which trauma patients will be managed if there is no operating room available. Who in the hospital can authorize this response to trauma saturation? How is it reviewed? How will the plan be amended if the applicant is designated as a trauma center? *ATTACH A COPY OF THE APPLICANT'S TRAUMA SATURATION PLAN/POLICY.*				
4.9	**Special Facilities, Resources, And Capabilities**				
4.9.1	Describe, in narrative form, the special facilities, resources, and/or capabilities of the facility. Include clear copies of all licenses, special permits, and other documentation.				
4.9.2	Describe, in narrative form, the surgical specialties and sub-specialties which are currently available to the hospital.				
4.9.3	Describe, in narrative form, the non-surgical specialties and sub-specialties which are currently available to the hospital.				
4.9.4	Describe, in narrative form, the clinical laboratory services which are available.				
4.9.5	Describe, in narrative form, the base hospital services which are available, to include compliance with				

	VCEMSA Policy 410.				
4.9.6	Describe emergency department Mobile Intensive Care Nurse (MICN) staffing. Explain MICN staffing relationships to paramedic call volume used.				
4.9.7	What full-time equivalency is provided for the position of Prehospital Care Coordinator (PCC)? (Note: Requires full time PCC)				
4.10	**Continuity Of Operations**				
	Describe, in narrative form, your Continuity of Operations Plan. Explain how your hospital has prepared to continue operations, and service/product delivery, in the event of an unforeseen emergency in compliance with CA Department of Public Health Hospital Preparedness and The Joint Commission. Also, explain how your hospital will provide assistance to the COUNTY should COUNTY operations be impacted by an unforeseen emergency.				

Scoring Key Appendix 4:

1- Not addressed
2- Partially addressed: inadequate description/documentation
3- Fully addressed: adequate description/documentation
4- Fully addressed: excellent description/documentation

5.1	A trauma program medical director who is a board-certified surgeon, whose responsibilities include, but are not limited to, factors that affect all aspects of trauma care such as:	Non-compliant, unlikely to attain compliance within 12 months	Non-compliant, likely to attain compliance within12 months	Non-compliant, likely to attain compliance within 6 months	Fully compliant
	1. recommending trauma team physician privileges;				
	2. working with nursing and administration to support the needs of trauma patients;				
	3. developing trauma treatment protocols;				
	4. determining appropriate equipment and supplies for trauma care;				
	5. ensuring the development of policies and procedures to manage domestic violence, elder and child abuse and neglect;				
	6. having authority and accountability for the				

	quality improvement peer review process;				
	7. correcting deficiencies in trauma care or excluding from trauma call those trauma team members who no longer meet standards;				
	8. coordinating pediatric trauma care with other hospital and professional services;				
	9. coordinating with local and State EMS agencies;				
	10. assisting in the coordination of the budgetary process for the trauma program; and				
	11. identifying representatives from neurosurgery, orthopedic surgery, emergency medicine, pediatrics and other appropriate disciplines to assist in identifying physicians from their disciplines who are qualified to be members of the trauma program.				
5.2	**A trauma nurse coordinator/manager who is a registered nurse with qualifications including evidence of educational preparation and clinical experience in the care of the adult and/or pediatric trauma patient, administrative ability, and responsibilities that include but**				

	are not limited to:				
	1. organizing services and systems necessary for the multidisciplinary approach to the care of the injured patient; 2. coordinating day-to-day clinical process and performance improvement as it pertains to nursing and ancillary personnel; and 3. collaborating with the trauma program medical director in carrying out the educational, clinical, research, administrative and outreach activities of the trauma program.				
5.3	**A trauma service which can provide for the implementation of the requirements and provide for coordination with the local EMS agency.**				
5.4	**A trauma team, which is a multidisciplinary team responsible for the initial resuscitation and management of the trauma patient.**				
5.5	**Department(s), division(s), service(s) or section(s) that include at least the following surgical specialties, which are staffed by qualified specialists:**				

	1. general;				
	2. neurologic;				
	3. obstetric/gynecologic;				
	4. ophthalmologic;				
	5. oral or maxillofacial or head and neck;				
	6. orthopedic;				
	7. plastic; and				
	8. urologic				
5.6	**Department(s), division(s), service(s) or section(s) that include at least the following non-surgical specialties, which are staffed by qualified specialists:**				
	1. anesthesiology;				
	2. internal medicine;				
	3. pathology;				

	4. psychiatry; and 5. radiology				
5.7	**An emergency department, division, service or section staffed with qualified specialists in emergency medicine who are immediately available.**				
5.8	**Qualified surgical specialist(s) or specialty availability, which shall be available as follows:**				
5.8.1	A general surgeon capable of evaluating and treating adult and pediatric trauma patients shall be immediately available for trauma team activation and promptly available for consultation;				
5.8.2	On-call and promptly available:				
	1. neurologic; 2. obstetric/gynecologic; 3. ophthalmologic; 4. oral or maxillofacial or head and neck;				

	5. orthopedic; 6. plastic; 7. reimplantation/microsurgery capability. This surgical service may be provided through a written transfer agreement; and 8. urologic				
	Requirements (5.8.1 and 5.8.2) may be fulfilled by supervised senior residents as defined above who are capable of assessing emergent situations in their respective specialties.				
	When a senior resident is the responsible surgeon: • *the senior resident shall be able to provide the overall control and surgical leadership necessary for the care of the patient, including initiating surgical care;* • *a staff trauma surgeon or a staff surgeon with experience in trauma care shall be on-call and promptly available;* • *a staff trauma surgeon or a staff surgeon with experience in trauma care shall be advised of all trauma patient admissions, participate in major therapeutic decisions, and be present in the emergency department for major resuscitations and in the operating room for*				

	all trauma operative procedures.				
5.8.3	Available for consultation or consultation and transfer agreements for adult and pediatric trauma patients requiring the following surgical services:				
	1. burns;				
	2. cardiothoracic;				
	3. pediatric;				
	4. reimplantation/microsurgery; and				
	5. spinal cord injury.				
5.9.	**Qualified non-surgical specialist(s) or specialty availability, which shall be available as follows:**				
5.9.1	Emergency medicine, in-house and immediately available at all times. This requirement may be fulfilled by supervised senior residents, as defined in Section 100245 of this Chapter, in emergency medicine, who are assigned to the emergency department and are serving in the same capacity. In such cases, the senior resident(s) shall be capable of assessing				

	emergency situations in trauma patients and of providing for initial resuscitation. Emergency medicine physicians who are qualified specialists in emergency medicine and are board certified in emergency medicine shall not be required by the local EMS agency to complete an advanced trauma life support (ATLS) course. Current ATLS verification is required for all physicians who provide emergency trauma care and are qualified specialists in a specialty other than emergency medicine.				
5.9.2	Anesthesiology. Level II shall be promptly available with a mechanism established to ensure that the anesthesiologist is in the operating room when the patient arrives. This requirement may be fulfilled by senior residents or certified registered nurse anesthetists who are capable of assessing emergent situations in trauma patients and of providing any indicated treatment and are supervised by the staff anesthesiologist. In such cases, the staff anesthesiologist on-call shall be advised about the patient, be promptly available at all times, and be present for all operations.				
5.9.3	Radiology, promptly available; and				
5.9.4	Available for consultation, per Policy 1406 [#14]				

	1. cardiology;				
	2. gastroenterology;				
	3. hematology;				
	4. infectious diseases;				
	5. internal medicine;				
	6. nephrology;				
	7. neurology;				
	8. pathology; and				
	9. pulmonary medicine.				
5.10.	**Radiological service. The radiological service shall have immediately available a radiological technician capable of performing plain film and computed tomography imaging. A radiological service shall have the following additional services promptly available:**				
	1. angiography; and				

	2. ultrasound.				
5.11.	**Clinical laboratory service. A clinical laboratory service shall have:**				
	1. a comprehensive blood bank or access to a community central blood bank; and 2. clinical laboratory services immediately available.				
5.12.	**Surgical service. A surgical service shall have an operating suite that is available or being utilized for trauma patients and that has:**				
5.12.1	Operating staff who are promptly available unless operating on trauma patients and back-up personnel who are promptly available; and				
5.12.2	Appropriate surgical equipment and supplies as determined by the trauma program medical director.				
5.13.	**A Level II trauma center shall have a basic or comprehensive emergency service which has special permits issued pursuant to Chapter 1, Division 5 of Title 22. The emergency service shall:**				

	1. designate an emergency physician to be a member of the trauma team; 2. provide emergency medical services to adult and pediatric patients; and 3. have appropriate adult and pediatric equipment and supplies as approved by the director of emergency medicine in collaboration with the trauma program medical director.				
5.14.	**In addition to the special permit licensing services, a trauma center shall have, pursuant to Section 70301 of Chapter 1, Division 5 of Title 22 of the California Code of Regulations, the following approved supplemental services:**				
5.14.1	Intensive Care Service:				
	1. the ICU shall have appropriate equipment and supplies as determined by the physician responsible for the intensive care service and the trauma program medical director; 2. the ICU shall have a qualified specialist promptly available to care for trauma patients in the intensive care unit. The qualified specialist may be a resident with two (2) years of training who is supervised by the staff				

	intensivist or attending surgeon who participates in all critical decision making; and 3. the qualified specialist in (2), above, shall be a member of the trauma team.				
5.14.2	Burn Center. This service may be provided through a written transfer agreement with a Burn Center.				
5.14.3	Physical Therapy Service. Physical therapy services to include personnel trained in physical therapy and equipped for acute care of the critically injured patient.				
5.14.4	Rehabilitation Center. Rehabilitation services to include personnel trained in rehabilitation care and equipped for acute care of the critically injured patient. These services may be provided through a written transfer agreement with a rehabilitation center.				
5.14.5	Respiratory Care Service. Respiratory care services to include personnel trained in respiratory therapy and equipped for acute care of the critically injured patient.				
5.14.6	Acute hemodialysis capability.				
5.14.7	Occupational therapy service. Occupational therapy services to include personnel trained in				

	occupational therapy and equipped for acute care of the critically injured patient.				
5.14.8	Speech therapy service. Speech therapy services to include personnel trained in speech therapy and equipped for acute care of the critically injured patient.				
5.14.9	Social Service.				
5.15.	**A trauma center shall have the following services or programs that do not require a license or special permit.**				
5.15.1	Pediatric Service. In addition to the requirements in Division 5 of Title 22 of the California Code of Regulations, the pediatric service providing in-house pediatric trauma care shall have:				
	1. a pediatric intensive care unit approved by the California State Department of Health Services' California Children Services (CCS); or a written transfer agreement with an approved pediatric intensive care unit. Hospitals without pediatric intensive care units shall establish and utilize written criteria for consultation and transfer of pediatric patients needing intensive care; and 2. a multidisciplinary team to manage child abuse				

	and neglect.				
5.15.2	Acute spinal cord injury management capability. This service may be provided through a written transfer agreement with a Rehabilitation Center;				
5.15.3	Protocol to identify potential organ donors as described in Division 7, Chapter 3.5 of the California Health and Safety Code;				
5.15.4	An outreach program, to include:				
	1. capability to provide both telephone and on-site consultations with physicians in the community and outlying areas; and 2. trauma prevention for the general public;				
5.15.5	Written interfacility transfer agreements with referring and specialty hospitals;				
5.15.6	Continuing education. Continuing education in trauma care shall be provided for:				
	1. staff physicians; 2. staff nurses; 3, staff allied health personnel; 4. EMS personnel; and				

	5. other community physicians and health care personnel.				
5.16.	**A quality improvement process to include structure, process, and outcome evaluations which focus on improvement efforts to identify root causes of problems, intervene to reduce or eliminate these causes, and take steps to correct the process. In addition the process shall include:**				
5.16.1	A detailed audit of all trauma-related deaths, major complications and transfers (including interfacility transfer);				
5.16.2	A multidisciplinary trauma peer review committee that includes all members of the trauma team;				
5.16.3	Participation in the trauma system data management system;				
5.16.4	Participation in the local EMS agency trauma evaluation committee; and				
5.16.5	A written system in place for patients, parents of minor children who are patients, legal guardian(s) of children who are patients, and/or primary caretaker(s) of children who are patients to provide input and feedback to hospital staff regarding the care provided to the child.				

5.16.6	Following of applicable provisions of Evidence Code Section 1157.7 to ensure confidentiality.				

Scoring Key Appendix 5:

    1- Non-compliant, unlikely to attain compliance within 12 months
    2- Non-compliant, likely to attain compliance within12 months
    3- Non-compliant, likely to attain compliance within 6 months
    4- Fully compliant

Facility Measures- Tool 2

<u>Financing</u>

Financial resources exist that support the planning, implementation and ongoing management of the administrative and clinical care components of the facility's trauma program. (CIT 4.3.)

1. Administrative, management and clinical care planning is not conducted.
2. Administrative, management and clinical care planning is conducted, but priorities are not identified.
3. Administrative, management and clinical care planning is conducted and priorities are identified, but are not linked to the budget process.
4. Administrative, management and clinical care planning is conducted, priorities are identified and linked to the expense budget, but revenue sources are not identified or allocated.
5. Administrative, management and clinical care planning is conducted, priorities are identified and linked to the expense budget, and revenue sources are identified and allocated.

The facility's trauma program is fully staffed; personnel understand policies and their job duties/ responsibilities. Staff indicates that they have input into management and operational decisions, and have reasonable access to needed equipment, supplies, training, and support as appropriate. (CIT 5.3)

1. The facility is constantly under-staffed and excessive turnover is an ongoing problem.
2. The facility is periodically under-staffed due to turnover.
3. The facility is usually able to maintain an adequate staff to perform the mission, but turnover and recruitment of new personnel is a challenge periodically.
4. The facility has low turnover and is able to recruit personnel as needed to fill any gaps. Personnel indicate that they are satisfied with working conditions and personnel policies.
5. The facility maintains a pool of candidates to fill any vacancies in a timely manner. The staff indicates high satisfaction with their working conditions, input into decision-making, and access to equipment, training, and supportive services.

Trauma Patient Management

The facility has a designated trauma program case manager to facilitate movement of patients throughout the system. (VC 1)

1. There is no case manager to coordinate care throughout the system.
2. A case manager exists but his/her role is limited to clinical treatment areas of the facility.
3. A case manager exists and facilitates movement of the injured patient throughout the system from transfer in, trauma care, rehabilitation and repatriation.
4. The case manager uses program policies and procedures to help alleviate obstacles to patient movement throughout the system "such as one call does it all for incoming patients".
5. The case manager is actively engaged in outreach activities with referring facilities and EMS agencies to ensure that issues concerning incoming patients and repatriation to local facilities are clearly addressed.

The facility, historically, keeps patients transferred in to its facility in accordance with its verification standards and, commensurately, transfers out patients beyond its verified capabilities. (VC 2)

1. The facility can not identify which patients are transferred in that are beyond their verified capacities and which patients are transferred out when their care is clearly within verified capacities.
2. The facility can identify which patients are transferred out to other trauma centers but the need for and root cause of the transfer are unclear.
3. The facility can identify patient's transferred out as well as those who are transferred in but are beyond their verified capacities but can not identify the root cause of the inappropriate inbound transfer.
4. The facility has strict guidelines that are applied prior to accepting inbound patients and transferring patients out to other centers based upon the verified capacity of the facility.
5. The facility monitors compliance with transfer policies and interjects quality improvement processes to ensure that only appropriate cases are transferred into the facility and similarly only cases beyond their verified capacity are transferred out.

Personnel Training

As part of the established standards, the facility has established appropriate levels of trauma training for nursing personnel who routinely care for trauma patients. (MTSPE 310.2)

1. There are no trauma training standards for nursing personnel who routinely care for trauma patients in the facility, for example, Advanced Trauma Care for Nurses (ATCN), Trauma Nursing Core Course (TNCC), Advanced Trauma Life Support (ATLS), or any national or State-recognized trauma nurse verification course.
2. There are trauma training standards for nursing personnel but no requirement for them to attend courses or to achieve certifications.
3. Trauma training courses for nursing personnel are offered sporadically and do not reach all nurses caring for trauma patients.
4. Nursing personnel who care for trauma patients in the facility receive initial trauma training but there is limited ongoing training.
5. Nursing personnel who care for trauma patients in the facility receive initial and ongoing trauma training, including updates in trauma care, continuing education, and trauma nurse certifications, as appropriate. Outcome data are monitored for performance improvement and subsequent training opportunities.

As new protocols and treatment approaches are instituted within the facility, structured mechanisms are in place to inform all personnel about those changes in a timely manner. (MTSPE 310.10)

1. The facility has no structured mechanism to inform or educate personnel in new trauma protocols or treatment approaches.
2. A structured mechanism is in place to inform or educate personnel in new trauma protocols or treatment approaches, but it *has not been tried or tested*.
3. A structured mechanism is in place to *inform* personnel in new protocols or treatment approaches as changes in the facility are identified.
4. A structured mechanism is in place to *educate* personnel in new protocols and treatment approaches.
5. A structured mechanism exists to educate personnel in new protocols and treatment approaches in a timely manner, and the *facility has a method to monitor compliance with new procedures as they are instituted*.

The facility's trauma program provides initial and continuing education programs including consistent with state and nationally recognized levels of trauma care.
(CIT 6.2)

1. The facility provides no initial or continuing education to its employees.
2. The facility provides some initial and continuing education for its employees.
3. The facility provides for a program of initial and continuing education to its employees
4. The facility provides a comprehensive program of initial and continuing education for its employees consistent with state and nationally recognized levels of care.
5. The facility provides for competency-based initial and continuing education consistent with state and nationally recognized levels of care. Continued competency is assured by periodic testing or review. Training programs are based on current best practices and are supported by distance learning resources.

Data Systems

The facility has a process to evaluate the quality, timeliness, completeness, and confidentiality of data. (MTSPE 102.4)

1. The facility has no process or written policy to evaluate the quality, timeliness, completeness, and confidentiality of data collected in the facility's trauma registry.
2. The facility has a process of evaluation and written policy of collected data, but there is *no evidence of compliance with regard to trauma data. Confidentiality of information is not ensured.*
3. The facility and trauma program *has draft written policies* in place for evaluating the quality (including both reliability and validity), timeliness, and completeness of trauma data and for ensuring confidentiality.
4. The facility is just *beginning the process of reviewing* the quality, timeliness, completeness, and confidentiality of data. There is some compliance with a draft written policy.
5. The facility has a comprehensive written policy and has *demonstrated compliance* concerning trauma data management and governance, including an evaluation of the quality, timeliness, and completeness of data, with confidential protection of records ensured while allowing appropriate access for research purposes.

Injury/illness prevention programs use trauma management system information to develop intervention strategies. (CIT 14.2)

1. There is no evidence to suggest that facility data are used to determine injury/illness prevention strategies.
2. There is some evidence that agency data are available for injury/illness prevention program strategies, but its use is limited and sporadic.
3. Facility data are routinely provided to the injury/illness prevention programs. The usefulness of the reports has not been measured, and prevention stakeholders are just beginning to use agency data for programmatic strategies and decision-making.
4. The facility reports on the status of illness/injury and injury mechanisms are routinely available to prevention stakeholders and are used routinely to realign prevention programs to target the greatest need.
5. A well-integrated agency data system exists. Evidence is available to demonstrate how prevention stakeholders routinely use the information to identify program needs, to develop strategies on program priorities, and to set annual goals for injury/illness prevention.

The trauma facility participates in a system data collection and information data sharing network, collects and integrates pertinent EMS data from field providers on each episode of care, and uses data for system improvements. (CIT 15.1)

1. There is no routine collection of data or system for EMS agency data capture in the trauma registry.
2. There is a minimal data set collected but it cannot be shared with other entities nor used for system improvements.
3. There is a data collection system, and some users access the information for system improvement activities. The use of the data is random and unfocused.
4. The data collection system is in place and used routinely by providers. The integration and use by other stakeholders is not completed
5. There is a robust information system that is integrated with other data bases. The facility inputs data into the data collection system on each episode of care. The data are used to analyze system performance and to make adjustments in education, training or policy as applicable.

<u>**Outreach**</u>

The trauma center leadership (medical director, trauma manager, trauma registrar) informs and educates referring facilities about trauma system policies and forms active collaborations facilitating improved trauma care and interfacility transfer. (MTSPE 207.2)

1. The facility has initiated no efforts to educate and inform referring facilities about trauma system development activities.
2. Limited interfaces referring facilities have occurred aimed at trauma system development.
3. Initial discussions have occurred between the facility leadership and leadership of referring facilities with regard to trauma system development.
4. Facility leadership has engaged referring facility leadership in discussion about the trauma system, improving trauma care, and interfacility transfer.
5. Facility leadership has developed a formal agreement with at least one referring facility to offer trauma patient consultation, trauma education of health professionals, or interfacility transfer.

The trauma center leadership (medical director, trauma manager, outreach coordinator) forms an active collaboration with referring facilities and injury prevention coalitions to promote the reduction of injury in the county.
(MTSPE 207.2)

1. The facility has been engaged in no targeted messaging or media campaigns to educate and inform the county about injury prevention needs.
2. The facility has been engaged in limited interfaces with the media, aimed at injury prevention. Activities have been limited to incident-specific response opportunities.
3. The facility has become engaged with the county injury prevention coalition to participate in an injury prevention effort.
4. The facility has taken a leadership role in the injury prevention coalition and coordinates at least one local injury prevention program.
5. The facility has a leadership role in injury prevention outreach within the county and it supports and coordinates multiple injury prevention outreach programs.

The facility trauma plan includes regional education efforts to promote and raise awareness of trauma and EMS efforts and activities and to promote wellness and prevention within the region. (CIT 13.4)

1. The facility is not currently involved in public education efforts.
2. The facility trauma plan contains a public education component but there are no activities related to this component.
3. The facility is involved with others in public education about trauma and EMS systems.

4. The facility plan drives activities that promote and raise awareness of the trauma and EMS system within the region.
5. The facility is taking a leadership role in promoting the trauma and E MS system and in promoting wellness and prevention within the region.

System Leadership

Representatives from the facility have participated in a multidisciplinary planning process for the trauma system serving the region. (CIT 1.1)

1. There is no evidence of participation in partnerships, alliances, or working together to integrate the system.
2. There have been limited, but sporadic, participation in planning groups but, to date, no ongoing commitment to meet regularly to design or implement the local system.
3. The facility participates in a committee that meets regularly to develop and implement a comprehensive system plan.
4. The facility demonstrates regular participation in the group and completes assigned tasks.
5. The facility representatives demonstrate leadership in the comprehensive system planning process.

The facility trauma program staff are leaders within its jurisdiction in the evaluation of Trauma System activities, services and system oversight. (CIT 8.4.)

1. Facility staff do not serve as leaders of system activities within the area of jurisdiction.
2. Facility staff are beginning a dialogue with the service providers and hospitals about regional evaluation and research needed to evaluate and improve services and patient care.
3. Facility staff engage some providers and hospitals in system oversight and evaluation but it is not across the entire region.
4. Facility staff serve leaders in system activities and have begun an evaluation agenda with service providers and referring hospitals.
5. Facility staff serve as leaders in the area trauma system and have been instrumental in working with providers, hospitals and other stakeholders in evaluating service delivery and providing oversight to the region.

The trauma physician leadership from the facility assists with appropriate local physician medical direction by providing technical assistance, training and other resources to local Emergency Medical and Trauma System (EMTS) agencies. (CIT 10.4)

1. Facility trauma physician leadership does not provide technical assistance, training or other resources to local EMS agencies in the area of medical oversight for trauma patients.
2. Facility trauma physician leadership provides technical assistance to establish or improve local medical direction (for trauma) when requested.
3. The facility trauma physician leadership monitors the provision of medical direction (for trauma) and provides technical assistance when necessary.
4. The facility trauma physician leadership provides technical assistance when necessary and makes medical direction courses and other resources available on a regularly scheduled basis in its facility and throughout the region.
5. The facility trauma physician leadership monitors the quality of medical direction (for trauma) in local agencies and facilities and supports consistency of medical direction throughout the region by providing medical directors' courses and other resources.

Quality Improvement

The facility's trauma program collect patient care and administrative data for each episode of care and have a mechanism to evaluate the data within their own facility including monitoring trends and identifying outliers. (CIT 8.2.)

1. Trauma patient care information is not being captured for each episode of care.
2. Trauma patient care information is captured and is being used for internal decision making and billing.
3. Trauma patient care data are provided to external agencies, e.g. county, state and NTDB, for aggregation, reporting and benchmarking
4. Trauma patient care and administrative data are collected and linked to prehospital data for its own internal monitoring.
5. A comprehensive trauma data collection system that is integrated into the hospital system. Routine evaluation and assessment of system performance and administrative services is completed and shared with all stakeholders, including prehospital agencies. Trends in patient care and service delivery are monitored and changes are made as necessary to improve patient care and service delivery.

Clinical care is documented in a manner that enables agency and system wide information to be used for quality monitoring and performance improvement. (CIT 11.2)

1. Clinical care is documented but documentation is not reviewed for local or regional quality monitoring or performance improvement.
2. Clinical care is documented and limited review is done at the local level.
3. Clinical care documentation is systematically reviewed at the local level but is not available electronically for quality monitoring and performance improvement.
4. Clinical care documentation is systematically reviewed at the local and system level and procedures exist to utilize care data to drive performance improvement.
5. Clinical care is systematically reviewed by the agency Medical Director at the local level and is documented in a manner that enables agency and system-wide data from other health care and public safety agencies to be used for quality monitoring and performance improvement. Oversight of the performance improvement process is done through the agency Medical Director.

Patient outcomes and quality of care are monitored. Deficiencies are recognized and corrective action is implemented. Variations in standards of care are minimized, and improvements are made routinely. (CIT 11.3)

1. There is no procedure for the facility, referring hospital and EMS to monitor patient outcome and prehospital quality of care.
2. The facility, referring hospital and EMS maintain an agency quality of care system including patient outcomes, but they do not regularly monitor these outcomes, or quality of care, nor do they regularly review findings together.
3. A joint, ongoing quality improvement program is in place to monitor and assure that quality of care is consistent with adopted protocols.
4. The quality improvement program monitors patient outcomes, and uses these data in an ongoing quality improvement program, and benchmarks outcomes against regional or statewide standards.
5. The quality improvement program monitors patient outcomes, and uses these data in an ongoing quality improvement/performance improvement program. Deficiencies in meeting the local standards are recorded, and corrective action plans are instituted. Results of comparisons with along with an explanation for significant variations from these norms, and a written plan to reduce unacceptable variations is generated. There is a process for confidentiality of findings and recommendations of PI activities.

The information system is used to assess system and provider performance, measure compliance with applicable standards/rules and to allocate resources to areas of greatest need or acquire new resources as necessary. (CIT 15.3.)

1. There is no information system in use within the facility.
2. The facility trauma information system is limited in scope and the data is generally used for billing purposes.
3. The facility's trauma information system is sometimes used to review system issues or individual performance.
4. The facility's information system is used by some providers to review system performance and compliance with applicable standards. The use of the data system is usually associated with an unusual occurrence rather than the routine course of system oversight, although efforts to make the system more accessible are in process.
5. There is a comprehensive information system that is used to assess system performance, measure compliance with applicable standards and allocate resources. The agency integrates the information system with other data bases to assist in routine analysis of system performance.

All Hazards Preparedness

Disaster training and exercises routinely include situations involving natural (e.g., earthquake), unintentional (e.g., school bus crash), and intentional (e.g., terrorist explosion) trauma-producing events that test expanded response capabilities and surge capacity of the facility and other system resources consistent with the overall response plan and system. (CIT 12.2)

1. Disaster training and exercise is not a routine part of the system.
2. Disaster training and exercises are solely the responsibility of the facility and are conducted sporadically.
3. Disaster training and exercises are conducted regularly and include facility response capabilities to all hazards events.
4. The agency, trauma, public safety and public health stakeholders have begun training and exercises in an all-hazards approach to disaster situations.
5. Exercises and training in all-hazards disaster situations are regularly conducted and include testing of facility's surge capacity. These exercises include facility, EMS, public safety and public health stakeholders. Debriefing sessions occur after each drill or event.

The information system is available for routine trauma system and public health surveillance. It can be accessed by individual users as well as management for system oversight. (CIT 15.2)

1. There is no information system in place.
2. There is an information system in place but it is not used by system providers.
3. There is an information system in place but its use is sporadic; some system oversight is done using the information system in place.
4. The information system is in place and is integrated with other data bases. It is used in some instances to review system performance but regular reports and system oversight using the information system has not been fully accomplished.
5. There is a fully integrated information system that routinely and regularly reports on individual and system performance. The system is used to make regular reports to management, and for establishing policy changes. Individual agencies can access the data base and produce reports.

<u>**Access to Care**</u>

The trauma center is located in or near major injury producing areas and is located on or near major roadways that serve to expedite ambulance travel times. (VC 3)

1. Traffic flow patterns (freeway back-ups) increase critically injured patient transport times to the trauma center by 10 minutes or more at least 6 hours per day.
2. Traffic flow patterns (freeway back-ups) increase critically injured patient transport times to the trauma center by 10 minutes or more at least 3 hours per day.
3. Traffic flow patterns (freeway back-ups) that are likely to increase critically injured patient transport times by 10 minutes or more have access to the trauma center by helicopter service.
4. Traffic flow patterns (freeway back-ups) rarely increase the transport times of critically injured patients to the trauma center.
5. Traffic flow patterns do not increase the transport times for critically injured patients to the trauma center.

The trauma center is located in or near major injury producing areas and is located in an area where rotor wing aircraft can land at the facility safely with easy patient transfer capabilities. (VC 4)

1. No helicopter landing zone is in close proximity to the hospital.
2. Helicopter transport requires landing at an area away from the hospital, requiring ground ambulance transfer to the trauma center
3. Helicopter landing zone has barriers (parking lot, fences, or other structures) that delay entrance to the trauma center
4. Facility's landing zone is on separate level from trauma resuscitation area. No designated private elevator service is available.
5. Facility's landing zone is on the same or a separate level from trauma resuscitation area. A designated private elevator service is available to rapidly transport the patient to the resuscitation area if on a separate level.

County Planning and Oversight

(Note: Individual Facilities Will **Not** Be Scored on These Criteria)

The Trauma System agency medical director is actively involved with the development, implementation, and ongoing evaluation of protocols to assure they

are congruent with the Emergency Medical Service (EMS) and hospital system design. These protocols include, but are not limited to, which resources to dispatch (ALS vs. BLS), air-ground coordination, triage, early notification of the medical care facility, pre-arrival instructions, treatment, transport and other procedures necessary to ensure the optimal care of ill and injured patients. (CIT 10.2)

1. There are no protocols.
2. Protocols have been adopted, but they are in conflict with the design of the local hospital resources.
3. Protocols have been adopted and are not in conflict with the local hospital resources, but there has been no effort to coordinate the use of protocols between the agency and the local hospital.
4. Protocols have been developed in close coordination with the local hospital medical director and are congruent with the local hospital resources.
5. Protocols have been developed in close coordination with the local hospital medical director and are congruent with the local hospital resources. There are established procedures to involve the appropriate dispatch, public safety and other critical stakeholder personnel and their supervisors in quality improvement and there is a "feedback link" to change protocols or to update education when appropriate.

The Trauma System plan has clearly defined the roles and responsibilities of agency personnel and for those emergency department personnel in treatment facilities accepting injured patients from the prehospital personnel. Evidence based written prehospital patient care protocols and guidelines are maintained and updated. (CIT 11.1)

1. There is no system plan that outlines roles and responsibilities of agency personnel or for those emergency department personnel accepting patients from field care providers. No written prehospital patient care protocols exist
2. There is no system plan, but written prehospital patient care protocols and guidelines exist.
3. A system plan and prehospital patient care protocols exist but are not reviewed and updated regularly.
4. The system plan clearly defines the roles and responsibilities of agency personnel and emergency department personnel in treatment facilities for trauma patients. Written protocols and prehospital care guidelines exist and are reviewed and updated at least annually.
5. The system plan clearly defines the roles and responsibilities of agency personnel and emergency department personnel in treatment facilities for both trauma and medical patients. The plan is reviewed and updated at least annually. Evidence based written treatment protocols and care guidelines exist for prehospital personnel. Critical patient protocols are jointly practiced by prehospital and hospital personnel.

There is a description of injuries within the trauma system jurisdiction including the distribution by geographic area, high-risk populations (pediatric, elder, distinct cultural/ethnic, rural, and others), incidence, prevalence, mechanism,

manner, intent, mortality, contributing factors, determinants, morbidity, injury severity (including death), and patient distribution using any or all the following: vital statistics, emergency department (ED) data, EMS data, hospital discharge data, State police data (those from law enforcement agencies), medical examiner data, trauma registry, and other data sources. The description is updated at regular intervals. (MTSPE 101.2)

*Note: Injury severity should be determined through the consistent and system-wide application of one of the existing injury scoring methods, for example, Injury Severity Score (ISS).

1   There is no written description of injuries within the trauma system jurisdiction.
2   One or more population-based data sources (e.g., vital statistics and medical examiner data) describe injury within the jurisdiction, but clinical data sources are not used.
3   One or more population-based data sources and one or more clinical data sources are used to describe injury within the jurisdiction.
4   Multiple population-based and clinical data sources are used to describe injury within the jurisdiction, and the description is systematically updated at regular intervals.
5   Multiple population-based and clinical data sources (e.g., trauma registry, ED data, and others) are electronically linked and used to describe injury within the jurisdiction.

Injury surveillance is coordinated with statewide and local community health surveillance. (MTSPE 102.2)

1   Injury surveillance, as described in 102.1, does not occur within the system.
2   Injury surveillance occurs in isolation from other health risk surveillance and is reported separately.
3   Injury surveillance occurs in isolation but is combined and reported with other health risk surveillance processes.
4   Injury surveillance occurs as part of broader health risk assessments.
5   Processes of sharing and linkage of data exist between EMS systems, public health systems, and trauma systems,   and the data are used to monitor, investigate, and diagnose community health risks.

Trauma data are electronically linked from a variety of sources. (MTSPE 102.3)

*Note: Deterministically means with such patient identifiers as name and date of birth. Probabilistically means computer software is used to match likely records through such less certain identifiers as date of incident, patient age, gender, and others.

1   Trauma registry data exist but are not deterministically or probabilistically linked to other databases.
2   Trauma registry data exist and can be deterministically linked through hand-sorting processes.
3   Trauma registry data exist and can be deterministically linked through computer-matching processes.
4   Trauma registry data exist and can be deterministically and probabilistically linked to at least one other injury database including: EMS data systems (i.e., patient care records, dispatch data, and others), ED data systems, hospital discharge data, and others.
5   All data stakeholders (insurance carriers, FARS, and rehabilitation, in addition to typical trauma system resources) have been identified, data access agreements executed, hardware and software resources secured, and the "manpower" designated to deterministically and probabilistically link, analyze, and report a variety of data sources in a timely manner.

The lead agency has adopted clearly defined trauma system standards (e.g., facility standards, triage and transfer guidelines, and data collection standards) and has sufficient legal authority to ensure and enforce compliance. (MTSPE 201.4)

1   The lead agency does not have sufficient legal authority and has not adopted or defined trauma system performance and operating standards, nor is there sufficient legal authority to do so.
2   Sufficient authority exists to define and adopt standards for trauma system performance and operations, but the lead agency has not yet completed this process.
3   There is sufficient legal authority to adopt and implement operation and performance standards including enforcement. Draft process procedures have been developed.
4   The authority exists to fully develop all operational guidelines and standards; the stakeholders are reviewing draft policies and procedures; and adoption by the lead agency, including implementation and enforcement, is pending.
5   The authority exists; operational policies and procedures and trauma system performance standards are in place; and compliance is being actively monitored.

The lead agency, in concert with a trauma-specific multidisciplinary, multi-agency advisory committee, has adopted a trauma system plan. (MTSPE 203.1)

1   There is no trauma system plan, and one is not in progress.
2   There is no trauma system plan, although some groups have begun meeting to discuss the development of a trauma system plan.
3   A trauma system plan was developed and adopted by the lead agency. The plan, however, has not been endorsed by trauma stakeholders.
4   A trauma system plan has been adopted, developed with multi-agency

groups, and endorsed by those agencies.

5 A comprehensive trauma system plan has been developed, adopted in conjunction with trauma stakeholders, and includes the integration of other systems (e.g., EMS, public health, and emergency preparedness).

The trauma system plan clearly describes the system design (including the components necessary to have an integrated and inclusive trauma system) and is used to guide system implementation and management. For example, the plan includes references to regulatory standards and documents, and includes methods of data collection and analysis. (MTSPE 203.4)

1 There is no trauma system plan.

2 The trauma system plan does not address or incorporate the trauma system components (prehospital, communication, transportation, acute care, rehabilitation, and others), nor is it inclusive of all-hazards preparedness, EMS, or public health integration.

3 The trauma system plan provides general information about all the components including all-hazards preparedness, EMS , and public health integration; however, it is difficult to determine who is responsible and accountable for system performance and implementation.

4 The trauma system plan addresses every component of a well-organized and functioning trauma system including all-hazards preparedness and public health integration.   Specific information on each component is provided, and trauma system design is inclusive of providing for specific goals and objectives for system performance.

5 The trauma system plan is used to guide system implementation and management. Stakeholders and policy leaders are familiar with the plan and its components and use the plan to monitor system progress and to measure results.

Financial resources exist that support the planning, implementation, and ongoing management of the administrative and clinical care components of the trauma system. (MTSPE 204.2)

1 There is no funding to support the trauma system planning, implementation, or ongoing management and operations for either trauma system administration or trauma clinical care.

2 Some funding for trauma care within the third-party reimbursement structure has been identified, but ongoing support for administration and clinical care outside the third-party reimbursement structure is not available.

3 There is current funding for the development of the trauma system within the lead agency organization consistent with the trauma system plan, but costs to support clinical care support services have not been identified (transportation, communication, uncompensated care, standby fees, and others). No ongoing commitment of funding has been secured.

4   There is funding available for both administrative and clinical components of the trauma system plan. A mechanism to assess needs among various providers has begun. Implementation costs and ongoing support costs of the lead agency have been addressed within the plan.

5   A stable (consistent) source of reliable funding for the development, operations, and management of the trauma program (clinical care and lead agency administration) has been identified and is being used to support trauma planning, implementation, maintenance, and ongoing program enhancements.

Designated funding for trauma system infrastructure support (lead agency) is legislatively appropriated. (MTSPE 204.3)

Note: Although nomenclature concerning designated, appropriated, and general funds varies between jurisdictions, the intent of this indicator is to demonstrate long-term, stable funding for trauma system development, management, evaluation, and improvement.

1   There is no designated funding to support the trauma system infrastructure.
2   One-time funding has been designated for trauma system infrastructure support, and appropriations have been made to the lead agency budget.
3   Limited funds for trauma system development have been identified, but the funds have not been appropriated for trauma system infrastructure support.
4   Consistent, though limited, infrastructure funding has been designated and appropriated to the lead agency budget.
5   The legislature has identified, designated, and appropriated sufficient infrastructure funding for the lead agency consistent with the trauma system plan and priorities for funding administration and operations.

The trauma system and the public health system have established linkages including programs with an emphasis on population-based public health surveillance, and evaluation, for acute and chronic traumatic injury and injury prevention. (MTSPE 208.1)

1   There is no evidence that demonstrates program linkages, a working relationship, or the sharing of data between public health and the trauma system. Population-based public health surveillance, and evaluation, for acute or chronic traumatic injury and injury prevention has not been integrated with the trauma system.
2   There is little population-based public health surveillance shared with the trauma system, and program linkages are rare. Routine public health status reports are available for review by the trauma system lead agency and constituents.

3   The trauma system and the public health system have begun sharing public health surveillance data for acute and chronic traumatic injury. Program linkages are in the discussion stage.
4   The trauma system has begun to link with the public health system, and the process of sharing public health surveillance data is evolving. Routine dialogue is occurring between programs.
5   The trauma system and the public health system are integrated. Routine reporting, program participation, and system plans are fully vested. Operational integration is routine, and measurable progress can be demonstrated. (Demonstrated integration and linkage could include such activities as rapid response to and notification of incidents, integrated data systems, communication cross-operability, and regular epidemiology report generation.)

The lead trauma authority ensures that each member hospital of the trauma system collects and uses patient data as well as provider data to assess system performance and to improve quality of care. Assessment data are routinely submitted to the lead trauma authority. (MTSPE 301.1)

1   There is no system-wide management information data collection system that the trauma centers and other community hospitals regularly contribute to or use to evaluate the system.
2   There is a trauma registry system in place in the trauma centers, but it is used by neither all facilities within the system nor the lead trauma authority to assess system performance.
3   The trauma management information system contains information from all facilities within a geographic area.
4   The trauma management information system is used by the trauma centers to assess provider and system performance issues.
5   Hospital trauma registry data are routinely submitted to the lead trauma authority, are aggregated, and are used to evaluate overall system performance.

There is well-defined trauma system medical oversight integrating the specialty needs of the trauma system with the medical oversight for the overall EMS system. (MTSPE 302.1)

Note: The EMS System medical director and the trauma medical director may, in fact, be the same person.

1   There is no medical oversight for EMS providers within trauma system.
2   EMS medical oversight for all levels of prehospital providers caring for the trauma patient is provided, but such oversight is provided outside of the purview of the trauma system.
3   The EMS and trauma medical directors have integrated prehospital medical oversight for prehospital personnel caring for trauma patients.

4   Medical oversight is routinely given to EMS providers caring for trauma patients. The trauma system has integrated medical oversight for prehospital providers and routinely evaluates the effectiveness of both on-line and off-line medical oversight.

5   The EMS and trauma system fully integrate the most up-to-date medical oversight and regularly evaluate program effectiveness. System providers are included in the development of medical oversight policies.

There are mandatory system-wide prehospital triage criteria to ensure that trauma patients are transported to an appropriate facility based on their injuries. These triage criteria are regularly evaluated and updated to ensure acceptable and system-defined rates of sensitivity and specificity for appropriately identifying the major trauma patient. (MTSPE 302.6)

1   There are no mandatory universal triage criteria to ensure trauma patients are transported to the most appropriate hospital.

2   There are differing triage criteria guidelines used by different providers. Appropriateness of triage criteria and subsequent transportation are not evaluated for sensitivity or specificity.

3   Universal triage criteria are in the process of being linked to the management information system for future evaluation.

4   The triage criteria are used by all prehospital providers. There is system-wide evaluation of the effectiveness of the triage tools in identifying trauma patients and in ensuring that they are transported to the appropriate facility.

5   System participants routinely evaluate the triage criteria for effectiveness. There is linkage with the trauma system, and sensitivity and specificity (over- and under-triage rates) of the tools used are regularly reported through the trauma lead authority. Updates to the triage criteria are made as necessary to improve system performance.

The trauma system plan has clearly defined the roles and responsibilities of all acute care facilities treating trauma and of facilities that provide care to specialty populations (e.g., burn, pediatric, spinal cord injury, and others). (MTSPE 303.1)

1   There is no trauma system plan that outlines roles and responsibilities of all acute care facilities treating trauma and of facilities that provide care to special populations.

2   There is a trauma system plan, but it does not address the roles and responsibilities of licensed acute care and specialty care facilities.

3   The trauma system plan addresses the roles and responsibilities of licensed acute care facilities or specialty care facilities, but not both.

4   The trauma system plan addresses the roles and responsibilities of licensed acute care facilities and specialty care facilities.

5   The trauma system plan clearly defines the roles and responsibilities of all acute care facilities treating trauma within the system jurisdiction.

Specialty care services are addressed within the plan, and appropriate policies and procedures are implemented and tracked.

The trauma system engages in regular evaluation of all licensed acute care facilities that provide trauma care to trauma patients and designated trauma hospitals. Such evaluation involves independent external reviews. (MTSPE 307.1)

1   There is no ongoing mechanism for the trauma system to assess or evaluate the quality of trauma care delivered by all licensed acute care facilities that provide trauma care to trauma patients and designated trauma hospitals.

2   There is a mechanism for the trauma system to evaluate trauma care services in designated trauma hospitals   through internal performance improvement processes.

3   There is a mechanism to evaluate trauma care services across the entire trauma care system through performance improvement processes.

4   Review of trauma care quality is both internal (through routine monitoring and evaluation) and external (through independent review during redesignation or reverification of trauma centers).

5   Quality of trauma care is ensured through both internal and external methods. Internal review is regular, and participation is routine for trauma stakeholders. External independent review teams provide further assurance of quality trauma care within all licensed acute care and trauma facilities treating trauma patients.

The lead agency has incorporated, within the trauma system plan and the trauma center standards, requirements for rehabilitation services including interfacility transfer of trauma patients to rehabilitation centers. (MTSPE 308.1)

1   There are no written standards or plans for the integration of rehabilitation services with the trauma system or with trauma centers.

2   The trauma system plan has incorporated the use of rehabilitation services, but the use of those facilities for trauma patients has not been fully realized.

3   The trauma system plan has incorporated requirements for rehabilitation services. The trauma centers routinely use the rehabilitation expertise although written agreements do not exist.

4   The trauma system plan incorporates rehabilitation services throughout the continuum of care. Trauma centers have actively included rehabilitation services and their programs in trauma patient care plans.

5   There is evidence to show a well-integrated program of rehabilitation is available for all trauma patients. Rehabilitation programs are included in the trauma system plan, and the trauma centers work closely with rehabilitation centers and services to ensure quality outcomes for trauma patients.

Laws, rules, and regulations are routinely reviewed and revised to continually strengthen and improve the trauma system. (MTSPE 311.4)

1   There is no process for examining laws, rules, or regulations.
2   Laws, rules, and regulations are reviewed and revised only in response to a "crisis" (e.g., malpractice insurance costs).
3   Laws, rules, and regulations are reviewed and revised on a periodic schedule (e.g., every 5 years).
4   Laws, rules, and regulations are reviewed by agency personnel on a continuous basis and are revised as needed.
5   Laws, rules, and regulations are reviewed as part of the performance improvement process involving representatives of all system components and are revised as they negatively impact system performance.

ACS - TSEPC Case Review Checklist

Case #   **Reviewer Primary:**

Check all that apply number 1-47.

PREHOSPITAL CARE

Inappropriate

1. Airway Mgmt. (unsuccessful intubation attempt, ☐

    esophageal intubation)

2. Bleeding Control ☐

3. Fluid Resuscitation (volume unsuccessful, IV attempt ☐

4. Fracture Stabilization ☐

5. Use of PASG ☐

6. Spine Protection (C-Spine or T+L Spine) ☐

7. Other Prehosp. _____ ☐

8. Documentation ☐

9. Not Applicable ☐

10. Deviation from SOP/SMO ☐

EMERGENCY DEPARTMENT

Inappropriate Stabilization/Tx

11. Airway Control ☐

12. I.V. Access (e.g. delayed or unsuccessful attempt) ☐

13. Fluid Resuscitation ☐

14. Use of Pressors ☐

15. Use of PASG ☐

Check all that apply number 1-47.

USE OF RESOURCES

Inappropriate

41. Prehospital resources ☐

42. Transportation resources ☐

43. Futile resuscitation effort ☐

44. Diagnostic resources ☐

45. Surgical procedures ☐

46. Blood products ☐

47. Other _____ ☐

CAUSE OF DEATH/PREVENTABILITY

Death < 24 hours post injury

(check only one this section PRN)

Primary cause of death was

48. Airway/respiratory ☐

49. CNS injury ☐

50. Hemorrhage ☐

51. Indeterminate ☐

52. Other _____ ☐

Death > 24 hours post injury

16. Chest Injury Treatment ☐

17. Documentation ☐

18. Not Applicable ☐

Inappropriate Diagnostic Proc.

19. Inappropriate imaging/diagnostics (failure to ☐

obtain or obtained inappropriately)

20. Failure to evaluate abdomen or chest ☐

21. Failure to recognize injury ☐

22. Other ER _____ ☐

OPERATIVE

23. Inappropriate operation ☐

24. Documentation ☐

25. Unavailable/NA ☐

POST OP/POST ER CARE

Inappropriate

26. Treatment of infections ☐

27. Treatment of re-bleeding ☐

28. Fluid Management ☐

29. Monitoring/mgmt. of head inj. ☐

30. Ventilatory care ☐

31. Other Post OP/ER _____ ☐

32. Documentation ☐

33. Not Applicable ☐

(check only one this section PRN)

Primary cause of death was

53. Airway/respiratory ☐

54. Hemorrhage ☐

55. Sepsis/infection ☐

56. CNS injury ☐

57. Indeterminate ☐

58. Other _____ ☐

Death was

(check only one this section)

59. Frankly preventable ☐

60. Possibly preventable ☐

61. Non-preventable care appropriate ☐

62. Non-preventable OFI ☐

63. Non-preventable no care ☐

there were opportunities for improvement

(check only one PRN)

64. Prehospital ☐

65. ER ☐

66. OR ☐

67. ICU ☐

TRAUMA SYSTEM

Inappropriate

(Check all that apply)

68. Activation of full team ☐

TIME

34.	Delay in EMS Response	☐
35.	Excessive scene time	☐
36.	Too much time in ER/X-Ray	☐
37.	Delay to OR (cause)_____	☐
38.	Diagnostic procedure delay	☐
39.	Therapeutic procedure delay	☐
40.	Documentation	☐
	Phase _____	

69. Prenotification/anticipation ☐

70. Arrival of trauma surgeon(s) ☐

71. Arrival of other team members ☐

72. Destination of transfer ☐

73. Timeliness of transfer ☐

PERFORMANCE IMPROVEMENT

74. Flagged for PI ☐

75. Documented loop closure ☐

Please add comments to the back of this form. If comments are included on reverse check here. ☐

Additional Information Needed ☐

EMS record ☐

Law Enforcement ☐

Other: please state ☐

Signature:_____   **Date:**_____

ACS-TSPEC Chart Review Face Sheet

Prehospital Times

Dispatch to Arrival Time   _____

Scene Time   _____

Transport Time   _____

Total Time   _____

ED/Hospital Times

Team/Trauma Surgeon Arrival Time   _____

Time to consultation: ortho/neuro, etc. _____

Total Time in ED   _____

Time to CT   _____

(Determined by GCS)

Time to Intubation   _____

(Determined by Airway/GCS status)

Time to OR   _____

(Determined By:

BP < 90/penetrating wounds;

sub or epidermal hematoma by neuro exam;

open fracture, vascular compromised limb)

Time in OR   _____

(Damage control vs.

long or too many procedures)

ICU LOS   _____

Ventilator Days   _____

Hospital LOS   _____