Trauma System
Performance Improvement Plan

February 26, 2015

Southern Nevada Health District ~ P.O. Box 3902 ~ Las Vegas, Nevada 89127

TERMS AND ACRONYMS

ACS-COT ---------- means American College of Surgeons Committee on Trauma

Board ---------- means Southern Nevada District Board of Health

DPBH ---------- means Department of Health and Human Services, Division of Public and Behavioral Health

Health Officer ---------- means Chief Health Officer of the Southern Nevada Health District or the Chief Health Officer's designee

HIPAA ---------- means Health Insurance Portability and Accountability Act

ICD-9-CM ---------- means International Classification of Diseases, Ninth Revision, Clinical Modification

NRS ---------- means Nevada Revised Statutes

EMSTS/OEMSTS --------- means Southern Nevada Health District Office of Emergency Medical Services & Trauma System

PAIS ---------- means DPBH Bureau of Preparedness, Assurance, Inspections and Statistics

PIPS ---------- means Performance Improvement and Patient Safety Program

RTAB ---------- means Regional Trauma Advisory Board

SNHD ---------- means Southern Nevada Health District

TMAC ---------- means Trauma Medical Audit Committee

TMD ---------- means Trauma Medical Director

TPM ---------- means Trauma Program Managers

TRUG ---------- means Trauma Registry User Group

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Southern Nevada Health District
Emergency Medical Services & Trauma System Program

The Southern Nevada Health District (SNHD) is committed to protecting and promoting the health and well-being of the residents and visitors of Clark County, Nevada, which includes regulatory oversight of the Emergency Medical Services and Trauma System.

Mission and Vision

The mission of the SNHD Trauma System Performance Improvement Program is to protect the public by assuring optimal trauma system operation and high quality trauma care resulting in the best possible patient outcomes. The Trauma System Performance Improvement Plan provides a framework that establishes objective mechanisms to determine whether medical care rendered to patients requiring the resources of the trauma system is safe, appropriate, and meets acceptable local and national standards. A continuous, comprehensive, multidisciplinary, evidence-based, performance improvement process promotes monitoring and evaluation of the trauma system; identification of opportunities for improvement; and development of corrective strategies. It is an essential component of the trauma system.

Authority and Scope

The Nevada Department of Health and Human Services, Division of Public and Behavioral Health (DPBH) is designated by Nevada Revised Statute (NRS) 450B.237 as having primary authority over the establishment of a program for the treatment of trauma throughout the state. In 2005, the authority to plan, implement, and monitor the Clark County trauma care system was delegated to the Southern Nevada District Board of Health. The District Board of Health has established and adopted a comprehensive trauma system plan and regulations which include consideration of and plans for the development and designation of new trauma centers in the county, based on the demographics of the county, and the manner in which the county may most effectively provide trauma services. This authority provides a unique opportunity to develop a trauma system that reflects local guidelines, protocols, and practices, and that is responsive to the needs of Southern Nevada.

Trauma System Regulation 200.100 requires the Office of Emergency Medical Services & Trauma System (OEMSTS) to develop a trauma performance improvement plan to provide continuous assessment of the structure, function, and effectiveness of the system. The plan must include the adoption and implementation of a standardized system to collect and manage data specific to trauma system evaluation and planning from permitted EMS agencies, trauma centers, hospitals, and other healthcare organizations. All EMS agencies, trauma centers, and hospitals that receive trauma patients are required to provide data when requested.

The Southern Nevada Trauma System Plan directs that trauma system performance improvement is a high priority and should promote public safety and quality patient outcomes through accountable and objective performance improvement activities. The trauma system performance improvement process consists of three major elements: 1) the internal process within each trauma center; 2) the external process, which includes periodic audits of each trauma center by the DPBH and/or SNHD; scheduled independent evaluations of trauma care and the trauma system by trauma care experts from the American College of Surgeons Committee on Trauma (ACS-COT); and system review and analysis by the Trauma Medical Audit Committee (TMAC), including confidential evaluation of the quality and efficiency of actual medical services when the TMAC functions as a peer review committee; and 3) ongoing data collection,

monitoring, and analysis of trauma data at the local, state, and national level to identify trends, gaps, and needs.

The SNHD, as the lead regulatory agency in Clark County, plays a central role in the acquisition and analysis of trauma system data. In addition, the Regional Trauma Advisory Board (RTAB) and TMAC share responsibility for interpreting the data to evaluate the efficiency and effectiveness of the trauma system and for determining progress in meeting identified performance goals and benchmarks.

The intent of this document is to define the process of performance improvement utilized within the Southern Nevada Trauma System.

Trauma Patient Population Criteria

A trauma patient is defined by Trauma System Regulations as a person who has sustained an acute injury which meets the trauma field triage criteria as outlined in the Clark County EMS System Trauma Field Triage Criteria Protocol. (Appendix L) A patient with major trauma is defined as a person who has sustained an acute injury which has the potential of being fatal or producing major disability and/or has an injury severity score of greater than 15.

Trauma patients who sustain injuries that meet the criteria outlined by the National Trauma Data Bank are included in the state trauma registry if the following conditions are met:

- The patient has at least one injury diagnostic code that falls within the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9-CM) ranges of 800-904.99, 925-929.99, or 940-959.99, **and**
- The patient was admitted to a health care facility **or** died following treatment or evaluation **or** was transferred into or out of a health care facility.

Data Collection and Analysis

The Southern Nevada Trauma System Plan defines the need to develop an information system that facilitates timely collection of data utilizing consistent data sets from the participants in the trauma care system. Quantitative and qualitative analysis and trending of the available data from mutually agreed upon data sources will be done using performance indicators and national evidence-based benchmarks to enhance system evaluation, planning, and improvement. Such data sources include: prehospital care records, trauma field triage criteria transport reports, trauma center reports, state trauma registry reports, National Trauma Data Bank reports, Trauma Quality Improvement Program reports, medical examiner reports, and the most recent Universal Billing Code data. To enhance local data collection efforts, the OEMSTS may require trauma centers to submit quarterly state trauma registry reports to the OEMSTS in addition to the DPBH.

The collection and analysis of data should include methods of monitoring system performance which results in problem identification, development of corrective action plans, reevaluation, problem resolution, outcome improvement, and loop closure.

The Trauma Registry User Group (TRUG) will evaluate, plan, implement, and monitor the trauma registry and other data sources to maintain consistency of the data collection process. The membership will be drawn from the Trauma Program Managers (TPM) and the Trauma Registrars at the trauma centers and the EMSTS manager or designee. The TRUG will meet at least annually.

Process for Monitoring Compliance

Internal Performance Improvement

According to the most recent edition of the ACS-COT "*Resources for Optimal Care of the Injured Patient*" publication, each trauma center must have a formal, validated, and fully functional internal medical performance improvement and patient safety (PIPS) program for its trauma service. As such, each trauma center will have a written performance improvement plan which describes this program. The PIPS program must include a reliable method for collecting data which can be used to identify opportunities for improvement, facilitate development of corrective action plans, and monitor, reevaluate, benchmark, and document problem resolution and outcome improvements.

The Trauma Medical Director (TMD) at each institution will be responsible for maintaining accepted standards of trauma care and for compliance with the Southern Nevada Trauma System Plan.

As part of the internal performance improvement process, each trauma center will perform its own case reviews and focused audits to identify specific issues or trends and develop appropriate actions to address identified issues. It is then the responsibility of the respective TMD and TPM to identify all trauma cases (including all trauma deaths) that meet the Southern Nevada Trauma System minimum medical audit criteria for external performance improvement review. (Appendix D)

External Performance Improvement

The trauma system performance improvement process is designed to recognize the interdisciplinary nature of trauma care and includes the trauma center/trauma system review process and the trauma medical audit review process.

Trauma Center/Trauma System Review

- Designated Trauma Center Audits: Periodic reviews will be performed by the DPBH Bureau of Preparedness, Assurance, Inspections and Statistics (PAIS) and/or SNHD to determine compliance with applicable state statutes, county regulations, and the Southern Nevada Trauma System Plan. The audits may include random chart reviews, reviews of trauma registry data, policies, procedures, performance improvement plans, and other records or documents.

  For designated Level I, II and III trauma centers, this process may be incorporated into the trauma center verification process by the ACS-COT and has unanimous support of all designated trauma centers within the Southern Nevada trauma system.

- Verification of Trauma Centers/Trauma System: On-site reviews will be conducted every three years by out-of-state trauma specialists from the ACS-COT to allow for independent evaluation to verify an institution's capabilities and performance as a trauma center based on the criteria contained in the most current "*Resources for Optimal Care of the Injured Patient*" document. The reviews are designed to evaluate the quality of care rendered by the trauma center and to assess the trauma center's participation in the overall effectiveness of the trauma system.

Review Process

The process for monitoring and reviewing the performance of the Southern Nevada Trauma System also includes identification of process or system related issues that need to be addressed in order to promote a culture that fosters patient care and system improvements that align with national benchmarks. When an event is identified by an individual or an entity, the process for review should include verification and validation of the issue, investigation of the relevant facts, resolution, feedback, and documentation of the activity for ongoing monitoring and trend analysis. (Appendix B)

Trauma Performance Improvement Committee Structure

The cornerstone of the trauma system review process is the TMAC. The TMAC is a multidisciplinary medical review committee of the District Board of Health that will meet regularly, including as a peer review committee, to review and evaluate trauma care in the system, monitor trends in system performance, and make recommendations for system improvements. The TMAC is designed to evaluate and improve trauma care by conducting detailed mortality and morbidity review of cases that meet one or more of the medical audit criteria, that have exceptional educational or scientific benefit, or that involve medical issues which require discussion or resolution. The TMAC, when functioning as a peer review committee, will discuss the quality and efficiency of medical care rendered and will make recommendations either to the provider organization or EMS agency, as appropriate, for improved trauma care or system performance. In addition, the TMAC will provide an educational forum for trauma care and opportunities for analysis of data and information of scientific value for research and strategic planning of the trauma system.

The TMAC shall meet no less than quarterly, on the third Wednesday of the month, at times arranged by the members of the TMAC and the OEMSTS. The meetings will follow a structured format and an agenda prepared by the EMSTS manager or designee.

The details of the TMAC process, including the scope of the committee, membership, attendance, voting rights, and documentation are outlined in the Trauma System Regulations, Section 500, Trauma Medical Audit Committee. (Appendix A) The TMAC may appoint subcommittees, either standing or ad hoc, as needed, to fulfill its functions.

Pre-Trauma Medical Audit Committee (TMAC)

The Pre-TMAC review team is a multidisciplinary subcommittee of the TMAC that is responsible for the initial screening of cases for referral to the TMAC. The Pre-TMAC shall meet no less than quarterly, on the third Wednesday of the month preceding the TMAC meeting, at times arranged by the members of the Pre-TMAC and the OEMSTS.

The Pre-TMAC standing members include:

- At least one TMD (rotating)
- TPMs
- EMSTS manager or designee

The ad hoc members that may participate include:

- Chairman of the TMAC
- Vice chairman of the TMAC
- EMS Agency representative (rotating)
- EMS QI Directors Committee representative
- Non-trauma center hospital representative
- County Medical Examiner or his/her designee
- Subject matter experts

Referral Process for Investigation or Review

TMAC Peer Review Process

The first step in the TMAC peer review process is the identification of cases for Pre-TMAC/TMAC review. Based upon the criteria for trauma case selection approved by the RTAB, each trauma center will

submit cases to the Pre-TMAC review team. (Appendix D) The TMD or TPM will complete a Pre-TMAC case summary following a uniform format. (Appendix F) Identified non-trauma center hospital cases will require a case summary to be completed by a representative of that hospital following the uniform format outlined in Appendix G.

The EMSTS manager or designee should be notified at least two (2) weeks prior to the Pre-TMAC meeting if ad hoc members of the Pre-TMAC or other specialty representatives need to be invited to participate in the meeting. The case summaries should be submitted by the TPM or EMSTS manager or designee at the Pre-TMAC meeting. All cases submitted will be reviewed at the Pre-TMAC meeting which will be scheduled at least quarterly.

Pre-TMAC Screening Process

The screening conducted through the Pre-TMAC process includes not only the medical care provided at the trauma centers, but may also include review of prehospital care, non-trauma center hospital care prior to transfer, deaths of trauma patients in non-trauma center hospitals and those who die at the scene.

The Pre-TMAC will perform the initial screening of cases to be submitted to the TMAC that meet the minimum medical audit criteria for case review or have special educational or scientific value. (Appendix D)

The initial screening will include:

1. Reviewing each case and developing specific questions about identified issues;
2. Requesting additional case information, if needed;
3. Discussing identified or previously unidentified opportunities for system improvement;
4. Providing information to the respective TMD, TPM or non-trauma center hospital representative so they can prepare the case(s) for formal review at the TMAC meeting; and
5. Forwarding selected cases to the multidisciplinary TMAC to be presented and evaluated. (Appendix E)

NOTE: Staff from the trauma center whose case is being considered should recuse themselves from the process of determining if their case should be forwarded to TMAC.

Appendix D outlines the RTAB approved screening criteria for assessing cases to be forwarded to the TMAC. Typically, the members of the Pre-TMAC review team, as well as the trauma centers, establish more rigorous screening processes.

Review of Deaths – Medical Examiner's Participation

The participation of the Clark County Coroner's Office is an important component of the trauma system's performance improvement activities. Upon request of the EMSTS manager or designee, the coroner or his/her designee should provide the OEMSTS with access to medical examiners' reports on deaths due to traumatic injury within the county. Access to the requested autopsy reports should be provided prior to the TMAC meeting to allow review for completeness or obvious system care issues. The documents provided by the Coroner's Office are confidential and are only to be used by the medical review committee of the District Board of Health when functioning as a peer review committee.

Trauma-related deaths that occur at a non-trauma center hospital will be reviewed at the Pre-TMAC meeting. If further investigation of any case is required, the EMSTS manager or designee will be the person primarily responsible for requesting information related to the case. A representative from the

non-trauma center hospital may be invited to either the Pre-TMAC or TMAC, as needed. Specific cases will be presented at the TMAC meeting by the representative of the non-trauma center hospital or their designee.

The Pre-TMAC screening process may identify any trauma-related death needing review and comment by the TMAC. Examples include:

- Deaths having been judged as "mortality without opportunity for improvement," "anticipated mortality with opportunity for improvement," and "unanticipated mortality with opportunity for improvement" by individual trauma center PIPS programs. (Appendix H)
- Other potential areas for TMAC review include, but are not limited to, adverse events which occur in trauma center or non-trauma center hospitals at any time during the episode of care.

During the Pre-TMAC meeting, all cases will be reviewed, and cases requiring further discussion will be selected and referred to the TMAC.

Preparing Case Materials for the TMAC

The EMSTS manager or designee will notify the trauma center or non-trauma center hospital if any additional documentation, such as diagnostic films or treatment protocols, need to be available at the TMAC meeting. The Pre-TMAC case summaries will be utilized by the EMSTS manager or designee to prepare the agenda for the TMAC meeting. Any documentation reviewed during the Pre-TMAC meetings should remain in the custody of the trauma centers' staff.

Determination of Judgments

The TMAC may select cases where questions are unresolved or information is insufficient to make a mortality category determination for review. All deaths must have a TMD's assessment of the management of the case and mortality category which best describes the case (i.e., "mortality without opportunity for improvement," "anticipated mortality with opportunity for improvement," or "unanticipated mortality with opportunity for improvement") (Appendix H)). In any instance where a trauma-related death has occurred in a trauma center, the Probability of Survival (P_s) is to be calculated as part of the case review.

Case Presentation

The TMAC chairman will facilitate the meeting, including the case reviews, discussions, recommendations or judgments. OEMSTS staff will formally document the proceedings and are responsible for storage of the information.

The TMD or his/her designees will present each case and respond to questions and comments related to the case. Case presentations should include all pertinent clinical data and other essential information and materials necessary. Comments will be solicited from the expert members of the TMAC in fields such as emergency medicine, pathology, neurosurgery, anesthesia, radiology, internal medicine, orthopedic surgery, trauma nursing, etc.

The comments and recommendations of the experts will be included in the TMAC summary of the presented case with the same requirement for action, follow-up, or subsequent further review by the TMAC as any other case.

NOTE: Staff from the trauma center whose case is being reviewed will not participate in the decisions for case determination for their hospital.

Categorization of Select Non-Death Cases

All non-death cases referred to TMAC for review will be discussed and a resolution or determination should be agreed upon. In cases where the issue is resultant patient morbidity, the Guideline for Judgment Concerning Morbidity Determination (Appendix I) should be utilized in determining the morbidity categorization. A quorum of TMAC members must be present for morbidity categories to be determined.

Categorization of Trauma-Related Deaths

All trauma-related deaths should be included in the Pre-TMAC screening process and may be forwarded to the TMAC. TMAC may require detailed presentation of any death identified from the review summaries from all trauma-related deaths. A death case where the autopsy is unavailable will be held over for review until the autopsy report becomes available.

Following presentation, in-hospital deaths reviewed will be considered for outcome determination by the TMAC. Any discrepancies in trauma center death categorization will be discussed and finalized by the committee. Category guidelines are contained in the Guideline for Judgment Concerning Mortality Determination (ACS) (Appendix H).

Non-Trauma Center Hospital Case Review

Feedback to the non-trauma center hospitals is critical to the performance improvement process for the trauma system. The TMAC chairman will be primarily responsible for leading the discussion to provide feedback.

Issues identified through the criteria for trauma case selection (Appendix D) or performance improvement review (Appendix B) process should be presented at the Pre-TMAC and reported to the TMAC, if needed.

Following presentation, a case will be considered for outcome determination by the TMAC. Cases will be discussed and finalized by the committee using the criteria found in the Guideline for Judgment Concerning Mortality Determination (ACS) (Appendix H) or the Guideline for Judgment Concerning Morbidity Determination (Appendix I).

The Trauma Field Triage Criteria Protocol (Appendix L) allows EMS agencies to transport patients who are outside a 50-mile radius from a designated trauma center to the nearest receiving facility, which may be a non-trauma center hospital. Such cases may be reviewed within the Pre-TMAC/TMAC process. (Appendix B)

Corrective Action Planning

All cases presented by the trauma centers to TMAC in which patient care was administered will include discussion of findings and action plans that were created in their PIPS program.

At the conclusion of each case review, the TMAC members will discuss the case and provide comments and/or recommendations to the trauma center. (Appendix J)

When an opportunity for improvement is identified, the TMAC should develop a corrective action plan to mitigate or prevent similar events from occurring in the future. Analysis of available data should direct appropriate evidence-based strategies to address the issue. The action plan should include measurable objectives, a method of assigning accountability for completion of each step of the action plan, a reasonable timeline, and re-evaluation of the desired outcome to assure resolution. (Appendix J)

Documentation of Analysis and Evaluation

Minutes for the TMAC will be kept by OEMSTS staff and distributed to the members at each meeting. Corrective action plans will be created using a uniform format as outlined in Appendix J. The case summaries for cases reviewed from each trauma center or non-trauma center hospital, together with the recommendations for action and the comments of the TMAC, will be documented, reviewed and monitored for significant trending by the EMSTS manager or designee.

Per Trauma System Regulation 500.000, all proceedings, documents, and discussions of the TMAC when functioning as a peer review committee are confidential and are covered under NRS 49.117 - 49.123 and NRS 49.265. The privilege relating to discovery of testimony provided to the TMAC shall be applicable to all proceedings and records of the TMAC, whose purpose is to review, monitor, evaluate, and report on trauma system performance.

Loop Closure and Re-evaluation

Any issues identified through the review process that result in the development of an action plan will be monitored and re-evaluated (loop closure) on at least a quarterly basis until the issue is considered resolved by the TMAC and OEMSTS.

The OEMSTS will monitor the activities of the TMAC for necessary further action in the form of SNHD regulation, procedure or protocol changes, or referral of issues to the RTAB, or other appropriate advisory boards or committees.

The OEMSTS does maintain the right to utilize independent outside expert review when quality of care issues are noted, which are not resolved through the TMAC process. The OEMSTS will collaborate with the trauma center where the issue has been identified to attempt a resolution that is agreeable to both the OEMSTS and the trauma center. If the issue is not resolved in this manner, the case may be forwarded to the DPBH Bureau of PAIS.

Integration into Emergency Medical Services Performance Improvement Process

The EMS Quality Improvement Directors Committee functions as a subcommittee of the Medical Advisory Board. The membership includes the quality improvement directors and/or medical directors for all permitted EMS agencies, the TMAC chairman or designee, and OEMSTS staff.

The mission of the committee is to ensure the coordination, integration, efficiency, and effectiveness of the EMS and trauma system. The system components that should be regularly evaluated include: communication, medical oversight, prehospital triage and transportation, and measurement of patient outcomes. The committee will analyze current data and identify new data sources, information, and research to promote system assessment and improvement.

Confidentiality Protection

When functioning as a peer review committee, the TMAC and its subcommittees, including the Pre-TMAC review team, are protected by the same confidentiality privilege provided to peer review committees of hospitals. NRS 49.117 expands the peer review committee protection to a medical review

committee of a district board of health that certifies, licenses, or regulates EMS providers pursuant to NRS Chapter 450B, but only when functioning as a peer review committee. NRS 49.119 provides that a peer review committee has the privilege to refuse to disclose its peer review proceedings and to prevent any other person from disclosing that information. NRS 49.265 specifies that medical review committees of district boards of health functioning as a peer review committee are not subject to discovery proceedings. NRS 49.121 provides that any member of the committee, a person whose work is being reviewed, and a person who offered testimony, an opinion, or documentary evidence to the committee may claim the confidentiality privilege. The confidentiality privilege is presumed to be claimed as to a particular matter unless a written waiver is signed by all persons entitled to claim the confidentiality privilege as to that matter.

In 1997, the Nevada Supreme Court found that for the purposes of the peer review committee privilege, the legislative intent in creating the privilege was to protect the internal operations of the peer review, and the documents derived directly from the process of peer review. When the TMAC functions as a peer review committee, with statutory privilege protection, this means:

- No person attending the meeting can be required to testify outside of the committee proceedings unless the person is a party to an action or a proceeding, the subject of which is reviewed by the TMAC functioning as a peer review committee
- No document prepared or generated by the committee is discoverable
- The open meeting law is not applicable, and no public notice is required
- Minutes may be kept, but should be marked as not for public review or reproduction, and are not available as such
- The proceedings are not subject to HIPAA

Members of the TMAC and its subcommittees, including the Pre-TMAC review team and all approved guests, will be required to sign a confidentiality statement prior to commencement of the meeting. Guest attendance is allowed for purposes of education or professional expertise with advance permission of the chairman and concurrence of the OEMSTS.

APPENDIX A

SECTION 500
TRAUMA MEDICAL AUDIT COMMITTEE

500.000 TRAUMA MEDICAL AUDIT COMMITTEE.

I. The Trauma Medical Audit Committee (TMAC) is a multidisciplinary medical review committee of the District Board of Health that will meet regularly, including as a peer review committee, to review, monitor, and evaluate trauma system performance and make recommendations for system improvements. The TMAC, when functioning as a peer review committee, derives its authority and privilege from NRS 49.117 - 49.123; NRS 49.265; and NRS 450B.237.

II. The scope of the TMAC shall include, but not be limited to:

A. Participation in the development, implementation, and evaluation of medical audit criteria;

B. Review and evaluation of trauma care in the county;

C. Review of trauma deaths in the county;

D. Participation in the designing and monitoring of quality improvement strategies related to trauma care; and

E. Participation in research projects

III. The TMAC shall consist of the following members:

A. The Standing TMAC members shall be appointed by the Health Officer. They include:

1. Trauma medical director from each designated trauma center
2. Trauma program manager from each designated trauma center
3. County medical examiner or designee
4. EMSTS manager or designee
5. Neurosurgeon recommended by the Health Officer
6. Anesthesiologist recommended by the Health Officer
7. Orthopedic surgeon recommended by the Health Officer
8. Emergency Physician not affiliated with a trauma center recommended by the Health Officer
9. Permitted emergency medical services agency medical director/quality improvement coordinator recommended by the Health Officer.

B. Ad hoc members that may participate include other relevant individuals or subject matter experts, as determined by the chairman and Health Officer.

IV. Each standing member may designate an alternate member to serve in his/her place should he/she be temporarily unable to perform the required duties of this section. The Health Officer will designate or approve the alternates for the other members of the TMAC.

V. Appointed members of the TMAC shall serve two (2) year terms, from January 1

through December 31 of the second year. The Health Officer may appoint persons to fill the unexpired portion of the terms of vacant positions on the TMAC in the manner prescribed in this section. The members shall elect their chairman from amongst the body.

VI. The TMAC shall meet on a quarterly basis unless the chairman determines that more or less frequent meetings are necessary.

VII. Members of the TMAC shall serve without pay.

VIII. Attendance

A. Attendance at the meetings for the trauma medical directors and trauma program managers or their designees is mandatory. The trauma medical directors and the trauma program managers are expected to attend 90% of the scheduled TMAC meetings annually. After three (3) consecutive absences in a calendar year, an appointed member may be replaced on the TMAC.

B. Resignations from the TMAC shall be submitted, in writing, to the OEMSTS.

C. Invitees may participate in the peer review of specified cases where their expertise is requested. All requests for invitees must be approved by the OEMSTS in advance of the scheduled meeting.

D. Invitees not participating in the peer review of specified cases must be approved by the OEMSTS and all trauma medical directors.

IX. Due to the advisory nature of the TMAC, many issues require consensus rather than a vote process. Vote process issues will be identified as such by the chairman. Voting members shall be the standing committee members. When voting is required, a simple majority of the voting members of the standing committee need to be present. Members may not participate in voting when a conflict of interest exists.

X. Minutes will be kept by OEMSTS staff and distributed to the members at each meeting. All official correspondence and communication generated by the TMAC will be approved by the TMAC members and released by OEMSTS staff on Southern Nevada Health District letterhead.

XI. All proceedings, documents, and discussions of the TMAC, when functioning as a peer review committee, are confidential and are covered under NRS 49.117 - 49.123 and NRS 49.265. The privilege relating to discovery of testimony provided to the TMAC shall be applicable to all proceedings and records of the TMAC, whose purpose is to review, monitor, evaluate, and report on trauma system performance.

All members and invitees shall sign a confidentiality agreement not to divulge or discuss information that would have been obtained solely through TMAC meetings. Prior to guest(s) participating in the meeting, the chairman is responsible for explaining the signed confidentiality agreement to invitees. Invitees should only be present for the portions of meetings they have been requested to attend.

XII. Nothing contained herein shall be construed as making any action or recommendation of the TMAC binding upon the Health Officer or the Board.

APPENDIX B
LEVELS OF PERFORMANCE IMPROVEMENT REVIEW

Primary Review

- Case identified by Trauma Medical Director (TMD), Trauma Program Manager (TPM) or EMSTS manager
- Case verified and validated using process outlined in District Procedure for Primary Performance Improvement Case Review (Appendix C)
- Immediate feedback and resolution may be possible at this level
- Activity should be documented for ongoing monitoring and trending

Secondary Review

- Case reviewed by TMD, TPM or EMSTS manager
- Systematic investigation of case conducted including:
    - Review of pertinent medical records
    - Validation of facts from individuals involved in case
    - Creation of timeline of the event
- Immediate feedback and resolution may be possible at this level
- If not, the case should be referred for internal multidisciplinary committee review for further analysis and event resolution
- Activity should be documented for ongoing monitoring and trending

Tertiary Review

- Case reviewed by TMD, TPM or EMSTS manager
- Systematic review of case selected according to the Criteria for Trauma Case Selection (Appendix D)
- Presentation at Pre-TMAC of facts as outlined in the Trauma Center Case Summary (Appendix F) or Non-Trauma Center Hospital Case Summary (Appendix G)
- Immediate feedback and resolution may be possible at this level
- If not, the case should be referred to TMAC for further analysis and event resolution
- Activity should be documented for ongoing monitoring and trending

Quaternary Review

- Case referred by Pre-TMAC to TMAC
- Systematic review by TMAC including presentation of facts as outlined in the Trauma Center Case Summary (Appendix F) or Non-Trauma Center Hospital Case Summary (Appendix G)
- Feedback and resolution should occur at this level
- Activity should be documented for ongoing monitoring and trending

APPENDIX C

DISTRICT PROCEDURE FOR PRIMARY PERFORMANCE IMPROVEMENT CASE REVIEW

When an individual or entity wishes to have an incident involving patient care reviewed within the Southern Nevada Emergency Medical Services & Trauma System, the following steps shall be taken:

1. The person requesting a review of an incident should contact the designated representative of the agency/hospital involved to initiate the process. If after gathering appropriate information and discussing the incident both parties are satisfied a problem does not exist, nothing further needs to be done.

2. If either party would like to pursue an investigation of the incident, the "Southern Nevada Health District EMS & Trauma System Incident Report" should be completed and submitted to the OEMSTS. This can be done electronically by accessing the website at the following address: http://www.southernnevadahealthdistrict.org/ems/incident-report/index.php

3. Upon receipt of the "Southern Nevada Health District EMS & Trauma System Incident Report" OEMSTS staff will review the case, gather information from the agencies/hospitals involved, and evaluate the need for further investigation. The agency/hospital may be asked to conduct an internal investigation, involving its medical director when appropriate, and provide a summary of its findings to the OEMSTS.

4. The personnel involved in the incident may be interviewed by the EMS Medical Director or his designee, and its agency/hospital medical director, to gather additional information.

5. Upon completion of the investigation, a report will be prepared and given to the agency/hospital representatives involved. Direct communication between the agency/hospital and complainant is recommended, with a brief written summary of actions taken provided to the OEMSTS.

6. A quarterly aggregate summary of the incidents reviewed by the OEMSTS will be prepared and reported at the EMS Quality Improvement Directors Committee and Trauma Medical Audit Committee meetings.

7. All documentation and correspondence regarding this quality improvement activity; to monitor, review, evaluate, and report on the appropriateness and quality of care provided a patient is confidential pursuant to NRS 49.117 – 49.123, NRS 49.265, NRS 450B.810 and NRS 629.061.

APPENDIX D

CRITERIA FOR TRAUMA CASE SELECTION

These criteria are used to assist in selecting trauma cases that promote continuous measurement, evaluation, and improvement in system performance.

The Trauma Medical Director and/or Trauma Program Manager at each trauma center, or the EMSTS manager or designee, will identify cases by audit criteria and/or by action of hospital/trauma performance improvement and patient safety (PIPS) programs that need to be reviewed by the trauma system TMAC process utilizing the following criteria:

- Deaths having been judged "mortality without opportunity for improvement," "anticipated mortality with opportunity for improvement," or "unanticipated mortality with opportunity for improvement." All trauma-related mortalities with opportunities for improvement identified by individual trauma center PIPS programs. (Appendix H)
    - Cases identified by review of the Medical Examiners' Reports
    - Patient outcomes impacted by the trauma system
    - Cases with pre-hospital care issues
    - All trauma patient transfers to a trauma center
    - All trauma transfers out of a trauma center
    - Cases identified as being treated at another trauma center prior to presenting to the current trauma center with care issues related to the first trauma center visit
    - Cases identified as being treated at a non-trauma hospital prior to presenting to a trauma center with care issues related to the first hospital visit
    - Any case with educational value
    - All cases with system-related issues

Cases which fall within these guidelines should have the case summary documentation (Appendix F or G) completed for the Pre-TMAC.

APPENDIX E

TMAC PROCESS ALGORITHM

Trauma Medical Director, Trauma Program Manager at each trauma center, or the EMSTS manager or designee identifies cases for Pre-TMAC/TMAC review based on Criteria for Trauma Case Selection (Appendix D) and prepares case summaries. (Appendix F)

↓

Pre-TMAC Review Team meets to screens all cases using summaries prepared by trauma program managers and selects cases to be submitted to the TMAC.

↓

Based on case summaries reviewed at the Pre-TMAC, the EMSTS manager or designee prepares the agenda and meeting materials for the TMAC.

↓

TMAC meets to review cases, make judgments, and make recommendations, if necessary.

↓

OEMSTS maintains records of proceedings, monitors TMAC activities for system issues or trends, and provides feedback for recommended changes to improve the trauma system.

APPENDIX F

TRAUMA CENTER CASE SUMMARY

Trauma Registry No: _____ Med Rec No: _____

Date of Admission: _____ Date of Discharge: _____

Age: _____ Sex: _____ ISS: _____ Ps: _____

Death: YES NO Judgment (if applicable): _____

Reason for Review:

Type of Incident / Mechanism:

Discharge Diagnosis:

Pertinent Clinical Data (i.e., Lab, X-Ray, ABG, etc.):

Surgical Procedures (Date / Procedure):

Complications:

Comments (Including QA, Pre-Hospital, Hospital):

Autopsy Findings (if applicable):

Evaluation of Care Rendered:

APPENDIX G

NON-TRAUMA CENTER HOSPITAL CASE SUMMARY

Case Number: _____ Medical Record Number: _____

Date of Admission: _____ Date of Discharge: _____

Age: _____ Sex: _____ ISS: _____ Ps: _____

Death: Yes No Judgment (if applicable): _____

Reason for Review:

Mechanism / Type of Incident:

Discharge Diagnosis:

Pertinent Clinical Data: (i.e., Prehospital vital signs, arrival vital signs, admission lab, ABG, etc.):

Procedures:

Complications:

Comments (Including QI/PI, Prehospital & Hospital):

Autopsy Findings:

Narrative Summary:

Evaluation of Care Rendered:

APPENDIX H

GUIDELINE FOR JUDGMENT CONCERNING MORTALITY DETERMINATION (ACS)

Old Judgment	Guideline	New Judgment
Non-preventable	Result of procedure, disease, illness, injury; appropriate preventable steps were taken.	Mortality without opportunity for improvement (OFI)
Potentially preventable	Result of procedure, disease, illness, injury; potential to be prevented or ameliorated.	Anticipated mortality with opportunity for improvement (OFI)
Preventable	Unexpected result that could have been prevented or ameliorated.	Unanticipated mortality with opportunity for improvement (OFI)

Source: 2014 Edition of the *Trauma Outcomes & Performance Improvement Course Manual* published by the Society of Trauma Nurses in collaboration with the American College of Surgeons Committee on Trauma.

APPENDIX I

GUIDELINE FOR JUDGMENT CONCERNING MORBIDITY DETERMINATION

Human Error	At-risk Behavior	Reckless Behavior
Product of current system design	Unintentional risk-taking	Intentional risk-taking
Manage through: 1. Processes 2. Procedures 3. Training 4. Design 5. Environment	Manage through: 1. Removing incentives for at-risk behaviors 2. Creating incentives for healthy behaviors 3. Increasing situational awareness	Manage through: 1. Processes 2. Disciplinary action
Recommended action: Counseling	Recommended action: Retraining	Recommended action: Disciplinary Action

Source: 2014 Edition of the *Trauma Outcomes & Performance Improvement Course Manual* published by the Society of Trauma Nurses in collaboration with the American College of Surgeons Committee on Trauma.

APPENDIX J

TRAUMA MEDICAL AUDIT COMMITTEE CORRECTIVE ACTION PLAN

Mortality/Morbidity Case Review **TMAC Meeting Date:**

Trauma Center:

Case Number	Reason for Review	Benchmark	Indicator/ Objectives	Discussion	Responsible Party	Timeline	Outcome	Loop Closure

This document and any attachments and correspondence surrounding it are part of the process to monitor, evaluate, review, and report on the necessity, quality, and level of patient care management provided a trauma patient and, as such, are confidential and privileged by law pursuant to NRS 49.117 - 49.123 and 49.265, and any and all other confidentiality laws and applicable privileges.

APPENDIX K

TRAUMA CENTER QUARTERLY REPORT

HOSPITAL _____ REPORT PERIOD _____

1. Number of patients in Trauma Registry for each month:
    - 0 - 14 years
    - 15 - 54 years
    - ≥ 55 years
2. Total Work-related Blunt Injuries for Adults
3. Total Work-related Penetrating Injuries for Adults
4. Mode of Arrival from Scene by two age groups, 0-14 years and ≥ 15 years:
    - Total Patients
    - Ground
    - Air
    - Other
5. Mechanisms of Injury for All Registry Patients by two age groups, 0-14 years and ≥ 15 years:
    - Cut/Pierce
    - Fall
    - Gunshot Wound
    - MV-Traffic Occupant
    - MV-Traffic Motorcyclist
    - MV-Traffic-Pedal Cyclist
    - MV-Traffic Pedestrian
    - MV-Traffic Unspecified
    - Struck by, Against
    - Other/Specified
6. Sending Facility by Region for Transfers In by two age groups, 0-14 years and ≥ 15 years:
    - Clark County
    - NV (other counties)
    - AZ
    - UT
    - CA
7. Transfers In by ISS by two age groups, 0-14 years and ≥ 15 years:
    - ISS Group 0-9
    - ISS Group 10-15
    - ISS Group 16-24
    - ISS Group ≥ 25
8. Transfers Out by ISS by two age groups, 0-14 years and ≥ 15 years:
    - ISS Group 0-9
    - ISS Group 10-15
    - ISS Group 16-24
    - ISS Group ≥ 25

9. Total Deaths by two age groups, 0-14 years and ≥ 15 years:
    - Dead on Arrival
    - ED Mortality Rate
    - Trauma Service Mortality Rate % (calculated by each trauma center annually)
    - Adjusted Mortality Rate % (calculated by OEMSTS annually)

10. Autopsy by two age groups, 0-14 years and ≥ 15 years:
    - Full
    - External or Head Only
    - None
    - Pending

11. PI Judgments by two age groups, 0-14 years and ≥ 15 years:
    - Mortality without Opportunities for Improvement
    - Mortality with Opportunities for Improvement
    - Pending

12. Total Blunt Deaths by two age groups, 0-14 years and ≥ 15 years
13. Total Penetrating Deaths by two age groups, 0-14 years and ≥ 15 years
14. Total Suicide Blunt Deaths by two age groups, 0-14 years and ≥ 15 years
15. Total Suicide Penetrating Deaths by two age groups, 0-14 years and ≥ 15 years
16. Total Work-related Blunt Deaths for Adults
17. Total Work-related Penetrating Deaths for Adults

18. Mechanism of Injury for Deaths by two age groups, 0-14 years and ≥ 15 years:
    - Cut/Pierce
    - Fall
    - Gunshot Wound
    - MV-Traffic Occupant
    - MV-Traffic Motorcyclist
    - MV-Traffic-Pedal Cyclist
    - MV-Traffic Pedestrian
    - MV-Traffic Unspecified
    - Struck by, Against
    - Other/Specified

19. Discharge Disposition for Registry Patients Only by two age groups, 0-14 years and ≥ 15 years:
    - Home from ED*
    - Home from Hospital*
    - Rehabilitation from Hospital
    - Skilled Nursing Facility/Long Term Care/Nursing Home
    - Other Acute Care Facility

    *includes discharge to jail, psychiatric facility, group home, against medical advice, etc.

20. Inability to Transfer to Higher Level of Care Issues by two age groups 0-14 years and ≥ 15 years

21. Trauma Center Readmissions
22. Rate of Overtriage for Trauma System by two age groups, 0-14 years and ≥ 15 years
23. Rate of Undertriage for Trauma System by two age groups, 0-14 years and ≥ 15 years
24. Total EMS Time (from time of dispatch to arrival in ED) by two age groups, 0-14 years and ≥ 15 years
25. Total EMS Scene Time (from time of arrival on scene to departure to hospital) by two age groups, 0-14 years and ≥ 15 years
26. Clark County EMS Documentation:
    - Number of complete reports
    - Number of incomplete reports
    - Number of missing reports
    - Outside of Clark County EMS

APPENDIX L

TRAUMA FIELD TRIAGE CRITERIA

A licensee providing emergency medical care to a patient at the scene of an injury shall use the following procedures to identify and care for patients with traumas:

1. **Step 1 – Measure vital signs and level of consciousness. If the patient's:**
   - **A. Glasgow Coma Scale is 13 or less;**
   - **B. Systolic blood pressure is less than 90 mmHg; or**
   - **C. Respiratory rate is less than 10 or greater than 29 breaths per minute (less than 20 in infant aged less than 1 year), or is in need of ventilatory support**

   the adult patient *MUST* be transported to a Level 1 or 2 center for the treatment of trauma in accordance with the catchment area designated. The pediatric patient MUST be transported to a pediatric center for the treatment of trauma.
2. **Step 2 – Assess anatomy of injury. If the patient has:**
   - **A. Penetrating injuries to head, neck, torso, or extremities proximal to elbow or knee;**
   - **B. Chest wall instability or deformity (e.g. flail chest);**
   - **C. Two or more proximal long-bone fractures;**
   - **D. Crushed, degloved, mangled, or pulseless extremity;**
   - **E. Amputation proximal to wrist or ankle;**
   - **F. Pelvis fractures;**
   - **G. Open or depressed skull fractures; or**
   - **H. Paralysis**

   the adult patient *MUST* be transported to a Level 1 or 2 center for the treatment of trauma in accordance with the catchment area designated. The pediatric patient *MUST* be transported to a pediatric center for the treatment of trauma.
3. **Step 3 – Assess mechanism of injury and evidence of high-energy impact, which may include:**
   - **A. Falls**
     - **1) Adults: greater than 20 feet (one story is equal to 10 feet)**
     - **2) Children: greater than 10 feet or two times the height of the child**
   - **B. High-risk auto crash**
     - **1) Motor vehicle was traveling at a speed of at least 40 miles per hour immediately before the collision occurred;**
     - **2) Intrusion, including roof: greater than 12 inches occupant site; greater than 18 inches any site;**
     - **3) Ejection (partial or complete) from automobile;**
     - **4) Motor vehicle rolled over with unrestrained occupant(s);**
     - **5) Death in same passenger compartment**
   - **C. Motorcycle crash greater than 20 mph**
   - **D. Auto vs pedestrian/bicyclist thrown, run over, or with significant (greater than 20 mph) impact**

   the patient *MUST* be transported to a Level 1, 2, or 3 center for the treatment of trauma in accordance with the catchment area designated. For patients who are injured outside a 50-mile radius from a trauma center, the licensee providing emergency medical care shall call and consider transport to the nearest receiving facility.

TRAUMA FIELD TRIAGE CRITERIA (Cont.)

4. **Step 4 – Assess special patient or system considerations, such as:**
   - **A. Older adults**
     1) **Risk of injury/death increases after age 55 years**
     2) **SBP less than 110 mmHg might represent shock after age 65 years**
     3) **Low impact mechanisms (e.g. ground level falls) might result in severe injury**
   - **B. Children should be triaged preferentially to a trauma center.**
   - **C. Anticoagulants and bleeding disorders: Patients with head injury are at high risk for rapid deterioration.**
   - **D. Burns**
     1) **Without other trauma mechanisms: transport in accordance with the Burns protocol**
     2) **With trauma mechanism: transport to UMC Trauma/Burn Center**
   - **E. Pregnancy greater than 20 weeks**
   - **F. EMS provider judgment**

The person licensed to provide emergency medical care at the scene of an injury shall transport a patient to a designated center for the treatment of trauma based on the following guidelines:

<u>St. Rose Dominican Hospital - Siena Campus (Level 3 Trauma Center) Catchment Area</u>

All trauma calls that meet Step 3 or in the provider's judgment meet Step 4 of the Trauma Field Triage Criteria Protocol and occur within the City of Henderson or the geographical area bordered by Interstate 15 to the west and Sunset road to the north, and the county line to the east, are to be transported to St. Rose Dominican Hospital - Siena Campus and the medical directions for the treatment of the patient must originate at that center;

<u>Sunrise Hospital & Medical Center (Level 2 Trauma Center) Catchment Area</u>

All adult trauma calls and pediatric Step 3 trauma calls that meet the Trauma Field Triage Criteria Protocol and occur within the geographical area bordered by Paradise Road to the west, Sahara Avenue to the north, Sunset Road to the south, and the county line to the east, are to be transported to Sunrise Hospital & Medical Center and the medical directions for the treatment of the patient must originate at that center;

In addition, adult trauma calls that meet Step 1 or 2 of the Trauma Field Triage Criteria Protocol and occur within the St. Rose Dominican Hospital - Siena Campus Catchment Area, City of Henderson, or the geographical area bordered by Paradise Road to the west continuing along that portion where it becomes Maryland Parkway, Sunset Road to the north, and the county line to the east, are to be transported to Sunrise Hospital & Medical Center and the medical directions for the treatment of the patient must originate at that center.

<u>University Medical Center (Level 1 Trauma Center and Pediatric Level 2 Trauma Center) Catchment Area</u>

All trauma calls that meet the Trauma Field Triage Criteria and occur within any other area of Clark County are to be transported to University Medical Center/Trauma and the medical directions for the treatment of the patient must originate at that center.

All pediatric Step 1 and Step 2 trauma calls that occur within Clark County are to be transported to University Medical Center/Trauma and medical directions for the treatment of the patient must originate at that center.

In addition, adult trauma calls that meet Step 1 or 2 of the Trauma Field Triage Criteria Protocol and occur in the geographical area bordered by Paradise road to the east, Sunset Road to the north, Interstate 15 to the west, and the county line to the south, are to be transported to University Medical Center/Trauma and the medical directions for the treatment of the patient must originate at that center.

TRAUMA FIELD TRIAGE CRITERIA (Cont.)

All trauma calls that meet the Trauma Field Triage Criteria Protocol, regardless of location, that are transported by air ambulance are to be transported to University Medical Center/Trauma and the medical directions for the treatment of the patient must originate at that center.

EXCEPTIONS:

1. **Nothing contained within these guidelines precludes transport to any trauma facility if, in the provider's judgment, time to transport to the designated center would be unduly prolonged due to traffic and/or weather conditions and might jeopardize the patient's condition.**
2. **Additionally, nothing contained within these guidelines precludes transport to the closest facility if, in the provider's judgment, an ability to adequately ventilate the patient might result in increased patient mortality.**

SNHD Trauma Field Triage Criteria protocol adapted from the "*2011 Guidelines for Field Triage of Injured Patients*" published in: Sasser SM, Hunt RC, Faul M, et. al. Centers for Disease Control and Prevention. "*Guidelines for field triage of injured patients: recommendations of the National Expert Panel on Field Triage*," 2011. MMWR.2012; 61 (RR-1):1-20.