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TRAUMA QUALITY IMPROVEMENT AND SYSTEM EVALUATION

I. AUTHORITY: Division 2.5, California Health and Safety Code, Sections 1798.162, 1798.163
California Code of Regulations § 100255, 100258, 100265
California Evidence Code, Section 1157.7

II. PURPOSE: To establish a system-wide Quality Improvement (QI) program for evaluating the Mountain-Valley EMS Agency Trauma System in order to foster continuous improvement in performance and patient care. In addition, it will assist the Mountain-Valley EMS Agency Trauma System in defining standards; evaluating methodologies; and utilizing the evaluation results for continued system improvement.

III DEFINITIONS:

A. "Trauma Center" or "designated trauma center" means a licensed hospital, accredited by the Joint Commission on Accreditation of Healthcare Organizations, which has been designated as a Level I, II, III, or IV trauma center and/or Level I or II pediatric trauma center by the local EMS agency, in accordance with California Trauma Care System Regulations.

B. "Quality Improvement" (or Quality Assurance) means a method of evaluation of services provided, which includes defined standards, evaluation methodologies and utilization of evaluation results for continued system improvement. Such methods may include, but are not limited to, a written plan describing the program objectives, organizations, scope and mechanisms for overseeing the effectiveness of the program.

IV. POLICY

Trauma system participants within the Mountain-Valley EMS System shall maintain a comprehensive quality improvement program designed to interface with the regional trauma Quality Improvement Program.

A. Trauma Center (Internal) Quality Improvement Requirements:

1. Internal Medical Quality Improvement Program
Each trauma center must have a formal and fully-functional, internal quality improvement program for its trauma service. As such, each trauma center shall have a written Quality Improvement Plan, which shall include:

a. A Trauma Medical Director (Chief of Trauma) - The Trauma Medical Director shall be responsible for the trauma care, as well as for compliance with the EMS Agency trauma plan and trauma standards.

b. Hospital Personnel Quality Improvement duties - The following functions shall be accomplished and shared by the Trauma Medical Director and the Trauma Coordinator. These individuals will perform at a minimum the following functions:
(1) Perform case reviews of ALL trauma cases
(2) Identify trauma cases that meet Mountain-Valley EMS Agency minimum audit criteria for external quality improvement review (see Appendix A for suggested indicators).
(3) Trauma Center personnel shall develop internal QI Indicators for review by appropriate committee.

(4) Analyze trends.
(5) Perform detailed audits of all trauma deaths, major complications, transfers, unexpected outcomes (positive or negative), and unusual occurrences.

c. Coordination of an internal multi-disciplinary trauma committee that includes members of the emergency medicine and general surgery departments, and when appropriate, other departments. The audit process will include a log of follow-up problems, and periodic, multi-disciplinary trauma conferences to critique selected trauma cases. This committee will follow the applicable provisions of Evidence Code Section 1157.7 to ensure confidentiality.

d. Provision of a system for patients and their significant others as defined in Title 22, Division 9, Chapter 7, Section 100265(d), to provide input and feedback to hospital staff regarding the care provided.

e. Attendance by appropriate personnel at regional Trauma Audit Committee (TAC) meetings.

f. Generation and submission of required trauma reports to the Mountain-Valley EMS Agency in a timely manner

g. Investigation of all unusual occurrences, as identified internally or referred by the Mountain-Valley EMS Agency, that will take no longer than fourteen (14) days OR a limited time mutually agreed upon by the Trauma Center and Mountain-Valley EMS Agency. The results (including any resolution or identification of further actions required) will be reported directly back to Mountain-Valley EMS Agency.

2. Educational Opportunities
An educational schedule from each of the Trauma Centers highlighting trauma activities shall be provided to Mountain-Valley EMS Agency on a quarterly basis. This schedule should include, Run Reviews, Trauma Management Rounds, Trauma Grand Rounds, and classes/courses related to trauma and trauma conferences. In addition, please indicate if the educational opportunity is open for outside participation. Mountain-Valley EMS Agency can then facilitate collaboration of these activities throughout the region, making the best use of resources dedicated to trauma education.

B. Trauma System (External) - Quality Improvement Plan

1. Written Agreement Requirements
Contract agreements shall be made with system participants to allow participation in the trauma care system, and to comply with all applicable State Regulations and regional Policies and Procedures, including participation in the regional Quality Improvement Program.

2. Regional Trauma QI Plan
The Regional Trauma QI Plan shall consist of the following elements:

a. An internal comprehensive quality improvement process designed to interface with the regional quality improvement program.

b. An ongoing external medical audit of case reviews by the Trauma Audit Committee.

c. A periodic local audit of each Trauma Center by Mountain-Valley EMS Agency.

d. Scheduled independent evaluations of the Level II Trauma Center(s) from experts outside of the region.

e. An ongoing local evaluation of the regional trauma system.

3. Trauma System Review

The local EMS agency will be responsible for a periodic performance evaluation of the trauma system, which will be conducted at least every two (2) years. This report will be available to trauma system participants.

4. Trauma Center Review

a. Level II Trauma Centers

(1) Verification of Designation:
A scheduled review is conducted by out-of-region trauma specialists to allow for independent evaluation for verification of Trauma Centers and effectiveness of the trauma system. It is designed to evaluate the quality of care rendered by the trauma centers, and to review for compliance with the components of the trauma system.

(2) Compliance Audit:
Scheduled reviews are performed by the Mountain-Valley EMS Agency to assure Trauma Center contract compliance. The audits may include random chart reviews, trauma registry data review, and review of other records and documents.

b. Level III or Level IV Trauma Center:

(1) Verification of Designation:
A scheduled review is conducted by the Mountain-Valley EMS Agency for verification of compliance as reported in the self-survey tool. It is designed to evaluate the quality of care rendered by the Trauma Center, and to review for compliance with the components of the trauma system.

(2) Compliance Audit:
Scheduled reviews are performed by the Mountain-Valley EMS agency to assure trauma canter contract compliance. The audits may include random chart reviews, trauma registry data review, and review of other records and documents.

5. Pre-Trauma Audit Committee

a. Description and purpose:
(1) The Pre- Trauma Audit Committee (Pre-TAC) review process provides initial review of charts at each Level II trauma center to identify cases for review by the Mountain Valley Trauma Audit Committee (TAC).
(2) A separate Pre-TAC review is conducted for each trauma center.

(3) The Pre-TAC review includes a detailed mortality and morbidity review of cases that meet one or more of the medical audit filter criteria as identified in Appendix A. Other cases that are regarded as having exceptional educational or scientific benefit may also be reviewed.

b. Confidentiality:
(1) The proceedings and records of this committee are confidential and are protected under section 1157.7 of the Evidence Code, State of California. Members and invited guests of the pre-TAC are required to sign a Confidentiality Agreement, which is maintained on file at the EMS agency, as a condition of attendance.
(2) Because of the confidentiality requirements, Pre-TAC meetings are closed and participants must be included by position on the list below or by special invitation only..

(3) Members shall not divulge or discuss information that would have been obtained solely through Pre-TAC membership.

(4) To maintain confidentiality, minutes and correspondence of the Pre-TAC are stored in a secure place at the EMS Agency by the Mountain Valley EMS Agency Trauma Coordinator. After review, all paperwork will be disposed of in an appropriate confidential manner.

c. Pre-TAC participants are:

(1) Mountain-Valley EMS Agency Medical Director and Merced County EMS Agency Medical Director

(2) Mountain-Valley EMS Agency Trauma Coordinator and Merced County EMS Agency Trauma Coordinator

(3) Trauma Coordinator of the Level II Trauma Center whose charts are being reviewed

(4) Chief of Trauma from the Level II Trauma Center whose charts are not being reviewed

(5) Guests may attend TAC with prior approval of the Chairperson and the Agency. Invited guests may participate in the meeting only after the Mountain-Valley EMS Agency has explained the Oath of Confidentiality, and obtained a signed confidentiality statement from the guest.

(6) Qualified Prehospital Personnel

(7) Trauma Registrar

d. The Chairperson for Pre-TAC is the MVEMSA Medical Director.

e. Pre-TAC Process:

(1) Pre-TAC will meet during the month prior to TAC meetings.

(2) Scope of Review: The review conducted by the committee includes trauma patient care in the Mountain-Valley EMS region and transfer of patients to other hospitals or designated trauma centers. The committee review includes, and is limited to:

(a) Prehospital trauma care activities.

(b) Trauma patient care from time of injury through rehabilitation

(3) Preparation for cases for TAC Review:

(a) The trauma center will prepare appropriate materials for its cases to be reviewed, to include:

(1) Audit reports as requested from the agency (see the Trauma Data Collection and Evaluation Policy).

(2) Clinical information

(3) Prehospital care report

(4) All pertinent radiologic examinations

(5) Autopsy findings, when appropriate. The trauma center is required to obtain the coroner's autopsy reports in a timely manner and make available for audits.

(b). The EMS Agency provides:

(1) Staff support for documentation (minutes) of meetings.

(2) Maintenance of records of proceedings.

(4). Conclusion of the Pre-TAC review:

(a) The committee will discuss each case and arrive at a conclusion for action that may include one or more of the following:

(1) No further review or action is indicated

(2) Additional information is needed

(3) The case is referred to TAC

(4) The case is referred to EMS Agency for review

6. Trauma Audit Committee (TAC)

TAC shall be a multi-disciplinary medical advisory committee to the EMS Agency, comprised of representatives from surgical and non-surgical specialties. This is a closed committee and attendees must be included by position on the list below or by special invitation only.

a. Mountain-Valley EMS Agency shall conduct the Trauma Audit Committee (TAC) as deemed necessary.

b. Oath of Confidentiality: The proceedings and records of this committee are confidential and are protected under section 1157.7 of the Evidence Code, State of California. Members and invited guests of the TAC shall sign a Confidentiality Agreement as a condition of attendance, which shall be maintained on file at the EMS agency.
   (1). Because of the confidentiality requirements, TAC meetings are closed. Members shall not divulge or discuss information that would have been obtained solely through TAC membership.
   (2) To maintain confidentiality, minutes/correspondence of the TAC shall be stored in a secure place at the EMS Agency by the EMS Agency Trauma Coordinator. After review, all paperwork shall be disposed of in an appropriate confidential manner.

c. Functions of the Trauma Audit Committee:
   The Trauma Audit Committee shall:
   (1) Conduct detailed mortality and morbidity review of cases that meet one or more of the medical audit filter criteria as identified by the trauma audit committee. Other cases may also be reviewed that are regarded as having exceptional educational or scientific benefit.
   (2) Establish Audit Filters.
   (3) Monitor the process and outcome of trauma patient care, and present opportunities for analysis of data and information of scientific value for studies and strategic planning of the trauma system.
   (4) Serve in an advisory capacity to the Mountain-Valley EMS Agency, Merced County EMS Agency, and Tuolumne County EMS Agency on trauma care systems issues and policies, which include the appropriateness and effectiveness of the Trauma Triage policy
   (5) Provide educational forums for trauma care when trends are identified.
   (6) Identify regional problems, including:
      a) Developing and implementing corrective action(s).
      b) Evaluating the effectiveness of corrective action(s).
      c) Monitoring the results and determining the frequency and methods of future monitoring.
      d) Assisting the Agency to conduct audits to evaluate whether recommended corrective action has resulted in improved care. The Agency shall inform the committee, at the next regularly scheduled meeting, of any recommendation that is overruled or modified with an explanation of the reversal or modification.
   (7) Assist representatives from the EMS agency with the intermediate review of the Trauma Center(s) compliance process.

d. Membership:
   The membership of the Mountain-Valley EMS Agency regional Trauma Audit Committee shall include:
   (1) Representatives from the Mountain-Valley EMS Agency, Merced County EMS Agency, and Tuolumne County EMS Agency:
      (a) EMS Agency Medical Director
      (b) Trauma Coordinator

(c) Staff Support

(2) Representatives from the Level II Trauma Center:
- (a) Chief of Trauma
- (b) Trauma Program Coordinator
- (c) Emergency Department Medical Director, Base Hospital Medical Director
- (d) Intensive Care Medical Director
- (e) Neurosurgeon, Orthopedic, and/or other surgical specialties as prearranged with Mountain-Valley EMS Agency.
- (f) Prehospital Liaison Nurse

(3) Representative from the Level III:
- (a) Trauma Medical Director, required.
- (b) Emergency Department Medical Director (recommended)
- (c) Trauma Program Nurse Coordinator / or Emergency Department Director

(4) Representatives from each Level IV Trauma Center or non-designated facility:
- (a) Medical staff representative, preferably Emergency Department Medical Director.
- (b) Trauma Program Nurse Coordinator or Emergency Department Director.

(5) Other Representatives:
- (a) Forensic Pathologist from county in which the Level II Trauma Center is located.
- (b) Law Enforcement participant
- (c) Other individuals who Mountain-Valley EMS Agency Medical Director deems necessary or their expertise is essential, on an ad-hoc or permanent basis, and appointed by Mountain-Valley EMS Agency Medical Director.

(6) Guests may attend TAC with prior approval of the Chairperson and the Agency. Invited guests may participate in the meeting only after Mountain-Valley EMS Agency has explained the Oath of Confidentiality and obtained a signed confidentiality statement by the guest.

e. TAC Chairperson:

(1) The Chairperson for TAC shall be the Chief of Trauma at one of the Level II Trauma Centers

(2) The Chairperson shall preside over the committee and make recommendations to Mountain-Valley EMS Agency, Merced County EMS Agency, and Tuolumne County EMS Agency as directed by the membership of the committee.

f. TAC Process:

(1). TAC shall meet a minimum of four (4) times a year for chart review, and jointly for formal education and/or trauma system evaluation according to the needs of the committee.

(2) Scope of Review: The review conducted by the committee shall include trauma patient care in the Mountain-Valley EMS region and transfer of patients to other hospitals or designated trauma centers. The committee review shall include and be limited to:
- a) Prehospital trauma care activities.
- b) Trauma patient care from time of injury through rehabilitation.

(3). Preparation for cases for TAC Review:
- a) Each trauma center shall prepare appropriate materials for its cases to be presented to the TAC to include:
  - (1) Audit reports as requested from the agency, (see the Trauma Data Collection and Evaluation Policy).
  - (2) Clinical information

(3) Prehospital care report
(4) All pertinent radiological examinations
(5) Autopsy findings, when appropriate. Each Trauma Center is required to obtain the coroner's autopsy report in a timely manner, and present as appropriate to audits including the trauma audit committee.
(6) A formal chart review may be performed by the Mountain-Valley EMS Agency Medical Director and the EMS Agency Trauma Coordinator prior to a Trauma Audit Committee Meeting. A letter will be sent out approximately one (1) month prior to the review of the charts, outlining the scheduling, the procedure and the trauma charts needing to be pulled for review.

b) The field representative shall provide the prehospital provider component for presentation when pertinent to the care of the trauma victim.
c) The EMS Agency shall provide:
(1) Staff support for documentation (minutes) of TAC meetings, to include any memorandum(s) issued by the Mountain-Valley EMS Agency in response to Committee recommendation(s).
(2) Distribution of meeting announcements.
(3) Preparation of TAC agenda.
(4) Maintenance of records of proceedings.

(4). Conclusion of Trauma Audit Committee Case Review: Feedback to the trauma centers and non-designated hospitals is critical to the audit process. Action Steps will be decided on at the conclusion of each case review. The committee shall discuss each case and arrive at a conclusion for action that may include one or more of the following:
a) No further review or action is indicated.
b) Request for additional information and follow-up report from the involved institution or prehospital care provider.
c) Formal recommendation requested:
(1) Letter
(2) Internal review
(3) Regional Investigation

(5). Removal from TAC
The following shall be cause for removal of a member from the committee:
a) Breech of confidentiality
b) Excessive absence, defined as two unexcused absences.
c) Disruption or rude behavior.

7. <u>Administrative Trauma Committee</u>
The Administrative Trauma Committee (ATC) is a multi-disciplinary administrative advisory committee to the EMS Agency, comprised of representatives from the trauma centers and other trauma system stakeholders.

a. Mountain-Valley EMS Agency will convene the ATC as deemed necessary, with a meeting at least once every calendar year.
b. Functions of the ATC:
(1) Serve in an advisory capacity to Mountain-Valley EMS Agency on non-clinical trauma care systems issues and policies.
(2) Respond to issues raised by TAC, as they relate to planning and operation of the trauma care system.
(3) Review proposed policy changes and make recommendations to RAC.

c. Membership of Mountain-Valley EMS Agency Administrative Trauma Committee:

(1) Representatives from Mountain-Valley EMS Agency:
a) Medical Director
b) Trauma Coordinator
c) Executive Director
d) Support staff

(2) Representatives from Merced County EMS Agency and Tuolumne County EMS Agency:
a) Medical Director
b) Trauma Coordinator
c) Executive Director

(3) Representatives from each Level II Trauma Center:
a) Chief of Trauma
b) Trauma Program Coordinator

(4) Representative from each Level III and Level IV Trauma Center:
a) Trauma Program Nurse coordinator or Trauma Medical Director

(5) Other Representatives, appointed by the Mountain-Valley EMS Agency Executive Director:
a) Fire department first responder
b) Ground ambulance service administrator
c) Air ambulance service administrator
d) EMT-paramedic
e) Public health department
f) Injury control program
g) Coroner's Office
h) Other individuals who the Mountain-Valley EMS Agency Executive Director deems necessary or their expertise is essential on an ad-hoc or permanent basis, and appointed by the Mountain-Valley EMS Agency Executive Director.

d. ATC Chairperson:
The Chairperson for the ATC is the Mountain-Valley EMS Agency Executive Director.

8. Standing / Ad Hoc Committees

a. Ad Hoc Committees
Ad Hoc Committees shall be time-limited committees, assisted by the EMS Agency Staff, with specific functions designed to assist the Trauma Audit Committee (TAC) to achieve their overall objectives.

b. Trauma Registry Users Group (TRUG)
The TRUG, assisted by the Trauma System Director, shall be composed of the Trauma Coordinators and Trauma Registrars within the region, and shall meet as necessary to plan, implement, and monitor the trauma registry and its data.

Appendix A

Suggested Audit Criteria for External Quality Improvement Review

1. Absence of a patient care report form for a patient transported by prehospital EMS personnel.
2. Greater than 20 minutes on the scene by prehospital EMS personnel.
3. Any failure or delay of the trauma surgeon or other specialist response in accordance with MVEMSA Policies 535.1 and 535.3.
4. Surgical consult >1 hour for a patient who is admitted to the hospital
5. Delay or failure to activate trauma team according to Regional policy.
6. A patient with a GCS of < 14 who does not receive a CT scan of the head within 2 hours of arrival at the trauma center.
7. A comatose trauma patient (GCS of <9) leaving the emergency department prior to the establishment of a definitive airway.
8. A patient sustaining a penetrating wound to the abdomen who is managed nonoperatively.
9. A patient with abdominal injuries who are hypotensive (SBP <90mmHG) who do not have a laparotomy within 1 hour of arrival; other patients undergoing laparotomy performed >4 hours after arrival
10. Patients with epidural or subdural brain hematoma receiving craniotomy >4 hours after arrival excluding those performed for ICP monitoring.
11. Interval of >8 hours between arrival and the initiation of debridement of an open fracture, excluding a low velocity gunshot wound
12. Abdominal, thoracic, vascular, or cranial surgery performed >24 hours after arrival
13. A major trauma patient admitted to a non-surgical service
14. Unexpected return to the operating room after initial surgery
15. Hourly determination and recording of B/P, pulse, respirations and GCS not done.
16. Nonfixation of femoral diaphyseal fracture in patients greater than twenty-four (24) months
17. Missed diagnosis
18. Readmission to hospital for complications related to prior admission
19. All trauma deaths
20. All outgoing trauma transfers performed within 24 hours of arrival
21. Any case the EMS Agency feels would benefit from a TAC review.
22. Any pre-hospital delay in the trauma center notification of patients meeting trauma criteria.

NOTE: Above criteria is based on those identified in the ACS document "Resources for Optimal Care of the Injured Patient, 1993: and the Tri-Analytics Trauma registry. Trauma centers may add additional audit filters for internal use for trends or sentinel events.