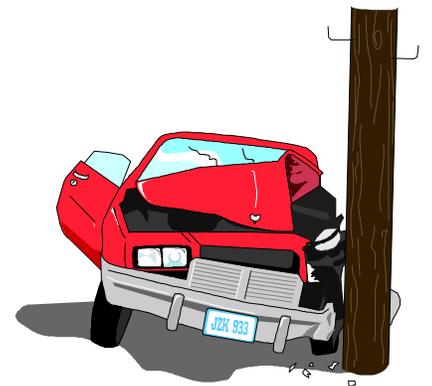
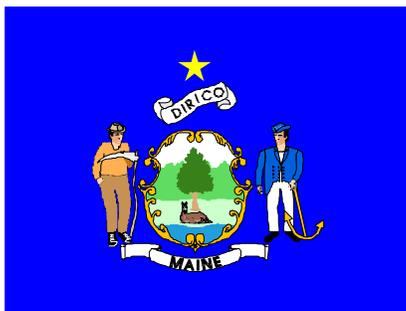
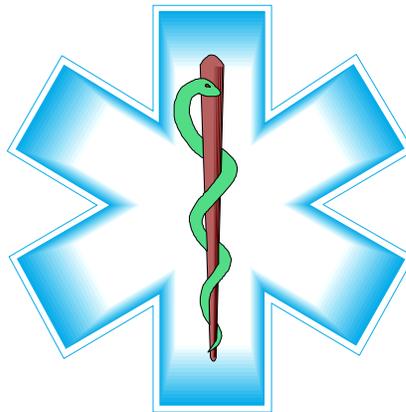
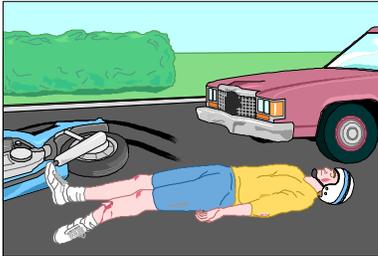


Maine EMS Trauma System Plan

OCTOBER 31, 1996



Maine EMS Trauma System Plan

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This document contains the Trauma Plan for the State of Maine. Also contained within is an application to participate in the **State of Maine Trauma System**.

Introduction

By the end of the Vietnam War, it had become apparent that war casualties were significantly reduced by the military's organized system of trauma care. Soon these principles were adapted for civilian trauma care systems. Organized regional trauma systems in Maryland and Orange County California demonstrated significantly lower morbidity and mortality for trauma victims. These successes led to the first round of Federal Trauma grants in the late 1970's and early 1980's. The trauma systems that developed relied on designated regional trauma centers. However, trauma centers became overburdened with minor trauma cases that could also be cared for at local hospitals. Because of these and other difficulties, trauma system development stagnated. Preventable death and morbidity did not abate. Rural areas in particular had higher morbidity and mortality due to long transport times, and lack of organized trauma care. In the early 1990's Congress began to appreciate that rural areas could also benefit from organized trauma systems. In 1992, Congress funded trauma system planning grants. Special consideration was given to rural areas that lacked organized trauma systems.

In early 1992, Maine Emergency Medical Services, (MEMS), established a Trauma Advisory Committee, (TAC), to create a statewide trauma plan. In September 1992, MEMS received a Federal Trauma Planning grant to assist in that effort. The TAC, which was then formalized by Maine Statute (5 MSRA §12004-I, sub-§49-B), has assisted MEMS in the establishment, implementation and management of a comprehensive trauma care system for the state.

TAC members have been drawn from around the state. Membership includes surgeons, emergency physicians, nurses, prehospital care providers, hospital administrators representing the Maine Hospital Association, and concerned citizens. Leaders of the American College of Surgeons Maine Committee on Trauma, Maine Chapter of the American College of Emergency Physicians, and nursing organizations have all been actively involved. The TAC worked very hard to build a comprehensive, state-wide trauma system for Maine.

Every hospital in the state is important to the functioning of the system and every hospital is indeed a ***Trauma System Hospital***. The responsibility and the challenge for every hospital is to provide excellent clinical services. The reward for participation will be inclusion in a coordinated, approved system of care, CQI based continuing education, outcome analysis, and community recognition as a Center of Excellence in trauma care.

The resulting system of care will be known as the ***Maine Trauma System***. Hospitals will participate in the System in one of two ways, as a ***Trauma Center*** or as a ***System Hospital***.

Trauma Center Responsibilities

A few system hospitals may elect to take on the responsibilities of being a *Trauma Center*. A major requirement is institutional and medical staff commitment to trauma management, with a surgeon-led **Trauma Service**.

Specific features of this commitment include:

- A Trauma Service with defined surgeon leadership;
- A functioning multi-disciplinary, multi-specialty Trauma Committee;
- A funded Trauma Nurse Coordinator to provide clinical, educational, and data/analytic services;
- Continuous availability of critical support and diagnostic services;
- A broad-based educational program with a regional and hospital focus;
- A willingness to fund the development and maintenance of the Trauma System, locally regionally, and statewide;
- The Trauma Nurse Coordinators will work with Maine EMS to support the statewide Trauma System.

Trauma System Hospital Responsibilities

Requirements include commitment to trauma system development and data sharing. Little, if any, additional cost or personnel will be necessary.

Specific requirements include:

- A functioning Emergency Department, staffed with physicians or physician-extenders who regularly participate in trauma care continuing education;
- A Medical Information system/department;
- Communication technology;
- A person designated to work with the regional Trauma Nurse Coordinator; and
- A commitment to Trauma System integration, participation in educational programs and allowing quality improvement review of process and outcome of patient clinical interactions.

What is in this Package?

This package contains the Trauma System Plan. Maine EMS, in conjunction with the Maine Hospital Association, trauma physicians, and nurses from around the state, have agreed to participate in this voluntary trauma plan.

Most trauma patients in Maine can receive excellent care in their local community hospitals. However, one goal is to identify those patients who will benefit most from the specialized resources of a trauma center. It is not the TAC's intention to mandate a change in a physician's or hospital's pre-existing specialty referral patterns.

This manual contains the following sections:

- A list of resources needed by trauma system hospitals and trauma centers;
- Trauma field triage protocols;
- A description of the site survey process for trauma centers and trauma system hospitals;
- An application to participate;
- A quality improvement program to measure and improve the quality of trauma care in Maine;
- An educational outreach program for participating trauma system hospitals; and
- Interfacility transfer guidelines to ensure the smooth transfer of seriously traumatized patients to trauma centers for specialized care.

Maine hospitals that participate in this program benefit in several ways:

- They will have access to on-site educational programs and case reviews provided by trauma centers;
- They will get timely feedback from trauma centers about transferred patients;
- They will get trauma registry software and participate in a statewide registry of trauma care;
- They will serve their communities better by participating in an organized system of trauma care. A large body of research has shown marked improvement in patient outcomes from serious trauma in areas of the country where such plans have been established. Universal, voluntary participation in this trauma plan will bring these outcome improvements to all the citizens of Maine.

Executive Summary

The Trauma Advisory Committee, (TAC), intends that Maine's trauma system will be inclusive. The TAC hopes that every hospital in the state will choose to participate. This plan was developed by physicians, nurses, hospital administrators from small, medium, and large hospitals, prehospital care providers, and representatives from the Maine Hospital Association.

The plan identifies two types of trauma facilities. All hospitals are expected to participate as **Trauma System Hospitals**. Virtually every acute care hospital in Maine meets the qualifications needed to become a trauma system hospital. Some hospitals may make a special commitment to become **Trauma Centers**. Maine EMS will actively promote each hospital as a participating **Trauma System Hospital** in this comprehensive trauma system. Hospitals are encouraged to publicize their participation as a system hospital. Trauma centers may not advertise their designation to the public.

Inside you will find the documents describing the requirements of each type of hospital, and instructions for application.

Thank you very much for your participation in this important patient care initiative in Maine!

Maine EMS, Trauma Advisory Committee Members, 1996

Altaf Ahmed, M.D.
Mid-Maine Medical Center
North Street
Waterville, ME 04901

Pret Bjorn, R.N.
Eastern Maine Medical Center
489 State Street
Bangor, ME 04401

Allen Browne, M.D.
7 Bramhall Street
Portland, ME 04102
Roy Cobean, M.D.
229 Vaughn Street
Portland, ME 04102

James Curtis, M.D.
Emergency Department
Penobscot Bay Medical Center
Rockland, ME 04841

Norman Dinerman, M.D.
Director, Emergency Medicine
Eastern Maine Medical Center
489 State Street
Bangor, ME 04401

Carol Grant
Houlton Regional Hospital
20 Hartford Street
Houlton, ME 04730

George Higgins, M.D.
Director, Emergency
Maine Medical Center
22 Bramhall Street
Portland, ME 04102

Larry Hopperstead, M.D.
Director, Trauma Surgery
Central Maine Medical Center
300 Main Street
Lewiston, ME 04240

James Jordan
Box 893, RR #1
Hampden, ME 04444
Clarence LaLiberty

Meredith Beals, R.N.
229 Vaughn Street
Portland, ME 04102

David Brown, M.D.
Central Maine Orthopedics
2 Great Falls Plaza
Auburn, ME 04210

David Clark, M.D.
229 Vaughn Street
Portland, ME 04102
Dwight Corning, EMT-P
Pace Paramedic Service
80 Main Street
Norway, ME 04268

Mary Day
Eastern Maine Medical Center
489 State Street
Bangor, ME 04401
Harold Gerrish, D.D.S.
P.O. Box 345
Dover-Foxcroft, ME 04426

Harry Grimmnitz, M.D.
Director, Emergency Medicine
Kennebec Valley Medical Center
6 E. Chestnut Street
Augusta, ME 04330

Barbara Hildbreth, R.N.
St. Joseph's Hospital
360 Broadway
Bangor, ME 04401

George Hutchins, M.D.
Southern Maine Medical Center
One Medical Center Drive
Biddeford, ME 04005

Thomas Judge, EMT-P
315 Harlow Street
Bangor, ME 04401
Vice President of Operations

Maine Medical Center
22 Bramhall Street
Portland, ME 04102

Peter Levasseur, M.D.
Director, Emergency Medicine
Kennebec Valley Medical Center
6 East Chestnut Street
Augusta, ME 04330
Jack McCormack, CEO
Cary Medical Center
Van Buren Road
Box 37
Caribou, ME 04736
James McKenney, EMT-P
151 Academy Street
Presque Isle, ME 04769
Lee Myles
Chief Operating Officer
St. Mary's Regional Medical Center
45 Golder Street
Lewiston, ME 04240
Vicki Purgavie
Maine Hospital Association
150 Capitol Street
Augusta, ME 04330
Sid Salvatore, R.N.
Mount Desert Island Hospital
P.O. Box 8
Bar Harbor, ME 04609

Peter Siviski, M.D.
10 High Street
Lewiston, ME 04240

John Weisendanger, CEO
Northern Cumberland Memorial Hospital
P.O. Box 230
So. High Street
Bridgton, ME 04009

Joanne LeBrun
EMS Regional Coordinator
Tri-County EMS, Inc.
300 Main Street
Lewiston, ME 04240
Laura Louder
Emergency Department
St. Joseph's Hospital
360 Broadway
Bangor, ME 04401
Kevin McGinnis
Director of Maine EMS
16 Edison Drive
Augusta, ME 04330

Cathy Moss, R.N.
229 Vaughn Street
Portland, ME 04102
Susan O'Connor, M.D.
Eastern Maine Medical Center
489 State Street
Bangor, ME 04401

Maryann Russell, R.N.
12 Powder Horn Avenue
Scarborough, ME 04074

Cindy Scribner, R.N.
Trauma Nurse Coordinator
Central Maine Medical Center
300 Main Street
Lewiston, ME 04240
David Stuchiner, M.D.
Chair, Maine EMS Trauma Advisory
Committee
Director, Emergency Medicine
Central Maine Medical Center
300 Main Street
Lewiston, ME 04240

Introduction to the Hospital Resource Table

Maine EMS in conjunction with the Maine Hospital Association, trauma physicians, nurses, and EMS providers have established two categories, Trauma Centers and Trauma System Hospitals. The goal is to make the system voluntary and universal. It is our hope that all Maine hospitals will participate in this plan.

This chapter consists of a table that lists the components needed for Trauma Centers and Trauma System Hospitals. It is our belief that all Maine hospitals have the necessary components to participate as Trauma System Hospitals. A smaller number of institutions may choose to participate as Trauma Centers. Trauma Centers are expected to make a larger commitment to the care of seriously injured patients. This includes dedicated resources for trauma education, outreach, and injury prevention programs.

Please keep in mind that hospitals may advertise only their participation in the Trauma System. They cannot publicize their individual status.

Maine Trauma System Hospital Resource Table

last revision 17 July 1995

This table shows levels of categorization as Trauma Center and Trauma System Participating Hospital and their essential (E) or desirable (D) characteristics.

* Denotes Quality Improvement indicators that should be monitored when compromise of the optimal, stricter standards is allowed.

	Divisions	
	Trauma Center	System Hospital
A. HOSPITAL ORGANIZATION		
1. Trauma Service	E	--
a. An obligation on the part of the institution and medical staff to care for trauma patients. Specified delineation of privileges for the Trauma Service by the medical staff Credentialing Committee may be desirable. The Trauma Service Director will be a board certified general surgeon with specific commitment to trauma care.		
b. Trauma Coordinator (Under direct supervision of Trauma Service Director)	E	--
c. Trauma Contact Person (responsible for communicating with regional trauma coordinators, coordinating trauma transfer feedback and trauma tracking forms, and periodic resource assessments. May also be a Trauma Coordinator)	E	E
2. Multidisciplinary Trauma Committee (Trauma Service Director, Trauma Coordinator, with representation from Anesthesiology, Critical Care, Emergency Medicine, General Surgery, Neurologic Surgery, Orthopedic Surgery, Radiology)	E	--
3. Hospital Departments/Divisions/Services/Sections		
Anesthesiology	E	--
Emergency Medicine	E	--
General Surgery	E	--
Neurologic Surgery	E	--
Orthopedic Surgery	E	--
Radiology	E	--
4. Specialty Availability		
<i>In-house 24 hours a day</i>		

	Trauma Center	System Hospital
Anesthesiology (May be satisfied by senior resident, CRNA, or by Anesthesiologist able to arrive in OR within 15 minutes of notification*)	E	--
Critical Care Physician (May be satisfied by senior resident or by ICU physician able to arrive within 30 minutes of notification, time of first call and ICU arrival to be routinely recorded*)	E	--
Emergency Medicine Physician	E	--
General Surgery (May be satisfied by senior surgical resident or by surgeon able to arrive in ED within 30 minutes of notification, time of first call and ED arrival to be routinely recorded*)	E	--
Neurologic Surgery (May be satisfied by physician with special competence in neurotrauma, determined by local neurosurgeon who will be able to arrive in ED within 30 minutes of notification, time of first call and ED arrival to be routinely recorded*)	E	--
<i>On-call and available within 30 minutes</i>		
Anesthesiology	See Page 8	--
Cardiac Surgery	D	--
Cardiology	E	--
Critical Care	See Page 8	--
Emergency Medicine	See Page 8	--
General Surgery	See Page 8	--
Hand Surgery	E	--
Infectious Disease	D	--
Internal Medicine	E	--
Microvascular Surgery	D	--
Nephrology	E	--
Neurologic Surgery	See Page 8	--
Obstetrics/Gynecologic Surgery	E	--
Ophthalmic Surgery	E	--
Oral/Maxillofacial Surgery	E	--
Orthopedic Surgery	E	--
Pediatrics	E	--
Pediatric Surgery (May be satisfied by general surgeon credentialed by hospital to provide surgical trauma care to pediatric patients)	E	--
Reconstructive/Plastic Surgery	E	--
Pulmonary Medicine	E	--
Radiology	E	--
Thoracic Surgery (May be satisfied by general surgeon credentialed by hospital to	E	--

	Trauma Center	System Hospital
provide thoracic surgical trauma care)		
Urologic Surgery	E	--
B. FACILITIES/RESOURCES/CAPABILITIES		
1. Emergency Department (ED)		
a. Personnel		
1. Designated physician director	E	--
2. Physician with special competence in care of the critically injured who is a designated member of the trauma team and physically present in the ED 24 hours a day	E	--
3. Nurses with special capability in trauma care	E	--
b. Equipment for resuscitation shall include but not be limited to:		
1. Airway control and ventilation equipment including laryngoscopes and endotracheal tubes of all sizes, bag-mask resuscitator, pocket masks, oxygen, and mechanical ventilator	E	E
2. Suction devices	E	E
3. Electrocardiograph-oscilloscope-defibrillator	E	E
4. Apparatus to establish central venous pressure monitoring	E	--
5. All standard intravenous fluids and administration devices, including intravenous catheters	E	E
6. Sterile surgical sets for standard ED procedures (thoracostomy, venous cut-down, thoracotomy, cricothyroidotomy, etc.)	E	E
7. Gastric decompression equipment	E	E
8. Drugs and supplies necessary for emergency care	E	E
9. X-ray capability, 24 hour coverage by in-house technician	E	--
10. Two-way radio linked with vehicles of emergency transport system	E	E
11. Skeletal traction device for cervical spine injuries	E	--
12. Thermal control devices for:		
a. Patient (e.g., circulating water or air blanket, radiant heater)	E	D
b. Blood and fluids (including rapid volume infuser)	E	D
13. Pulse oximetry	E	D
14. End-tidal CO ₂ determination	E	--
15. Pneumatic Anti-Shock Garment (PASG)	E	D
2. Intensive Care Units (ICUs) for trauma patients		

	Trauma Center	System Hospital
a. Designated physician director	E	--
b. Critical Care physician on duty in ICU 24 hours a day or immediately available from in-house (May be satisfied by senior resident or by ICU physician able to arrive within 30 minutes of notification)	E	--
c. Immediate access to clinical laboratory services (including Hb/Hct, ABG, CXR within 30 mins. of request)	E	--
d. Equipment:		
1. Airway control and ventilation devices	E	--
2. Oxygen source with concentration controls	E	--
3. Cardiopulmonary resuscitation cart	E	--
4. Temporary transvenous pacemaker	E	--
5. Electrocardiograph-oscilloscope-defibrillator	E	--
6. Cardiac output monitoring	E	--
7. Electronic pressure monitoring	E	--
8. Mechanical ventilator-respirators	E	--
9. Patient weighing devices	E	--
10. Pulmonary function measuring devices	E	--
11. Thermal control devices for:		--
a. Patient (e.g.. circulating water or air blanket, radiant heater)	E	--
b. Blood and fluids (including rapid volume infuser)	E	--
12. Inotropic drugs, fluids, supplies	E	--
13. Intracranial pressure monitoring devices	E	--
14. Pulse oximetry	E	--
15. Skeletal traction devices	E	--
16. Peritoneal lavage equipment	E	--
3. Postanesthetic Recovery Room (ICU is acceptable)		
a. Registered nurses and other essential personnel 24 hours a day	E	--
b. Equipment for continuous monitoring of hemodynamics	E	--
c. Intracranial pressure monitoring devices	E	--
d. Pulse oximetry	E	--
e. End-tidal CO ₂ determination	E	--
f. Thermal control devices for:		--
1. Patient (e.g.. circulating water or air blanket, radiant heater)	E	--

	Trauma Center	System Hospital
2. Blood and fluids (including rapid volume infuser)	E	--
4. Acute Hemodialysis Capability	E	--
5. Organized Burn Care		
a. Physician-directed burn center staffed by nursing personnel trained in burn care and equipped properly for care of the extensively burned patient OR b. Transfer agreement with a burn center	E	E
6. Acute Spinal Cord/Head Injury Management Capability		
a. In circumstances where a designated spinal cord injury rehabilitation center exists in the region, early transfer should be considered; transfer agreements should be in effect	E	E
b. In circumstances where a head injury center exists in the region, transfer should be considered in selected patients; transfer agreements should be in effect	E	E
7. Radiological Special Capabilities		
a. In-house radiology technician 24 hours a day	E	--
b. Angiography of all types	E	--
c. Sonography	E	--
d. Nuclear scanning	D	--
e. In-house computed tomography (CT)	E	--
f. In-house CT technician 24 hours a day (May be satisfied by technician able to respond within 30 minutes of notification, time of first call and arrival to be recorded routinely*)	E	--
g. Neuroradiology	D	--
8. Rehabilitation Medicine		
a. Physician-directed rehabilitation service staffed by nursing personnel trained in rehabilitation care and equipped properly for care of the critically injured patient OR b. Transfer agreement with a rehabilitation service	E	E
9. Operating Suite Special Requirements		
a. Personnel - Operating room adequately staffed and immediately available 24 hours a day before patient arrives	E	--
b. Equipment shall include, but not be limited to:		
1. Cardiopulmonary bypass capability	D	--

	Trauma Center	System Hospital
2. Operating microscope	D	--
3. Thermal control devices for:		
a. Patient (e.g. circulating water or air blanket, radiant heater)	E	D
b. Blood and fluids (including rapid volume infuser)	E	D
4. X-ray capability (including C-arm image intensifier)	E	--
5. Endoscopy (bronchoscopy, esophagoscopy)	E	--
6. Craniotomy instruments	E	--
7. Fixation equipment for long bone and pelvic fractures	E	--
10. Clinical Laboratory Services available 24 hours a day		
a. Standard analyses of blood, urine, and other body fluids	E	D
b. Blood antigen matching	E	--
c. Coagulation studies	E	--
d. Comprehensive blood bank or access to a community central blood bank and adequate hospital storage facilities	E	--
e. Blood gases and pH determinations	E	D
f. Microbiology	E	--
g. Serum alcohol determination	E	D
h. Drug screening	E	--
11. Organ Transplantation/Donation		
Procedures should be in place through which brain death can be declared, a family approached regarding organ donation, a potential donor supported, and organ procurement coordinated with the regional organ procurement center..	E	E
C. QUALITY IMPROVEMENT		
1. Organized Quality Improvement Program	E	E
2. Special audit for all trauma deaths	E	D
3. Morbidity and mortality review	E	D
4. Multi disciplinary trauma conference (Regular and periodic conferences that include all members of the trauma team. This conference will be for the purpose of quality assurance through critiques of individual cases)	E	D
5. Medical nursing audit, utilization review, tissue review	E	D
6. Hospital-based trauma registry		
a. Trauma registry review (Documentation of severity of injury and outcome by trauma score, age, injury severity score, survival, length of stay, ICU length of stay with monthly review of statistics)	E	E

	Trauma Center	System Hospital
b. Trauma Registrar (responsible for data entry, report generation, and maintenance of hospital-based trauma registry)	E	--
7. Review of prehospital and regional systems of trauma care	E	E
8. Published on-call schedule for general surgeons, neurologic surgeons, orthopedic surgeons, thoracic surgeons	E	D
9. Reasons for trauma-related hospital destination decision documented and reviewed by quality improvement program	E	E
D. OUTREACH PROGRAM		
Telephone and on-site consultations with physicians of the community and outlying areas	E	D
E. PUBLIC EDUCATION		
Injury prevention in the home and industry, and on the highways and athletic fields; standard first-aid; problems confronting public, medical profession, and hospitals regarding optimal care for the injured	E	--
F. TRAUMA RESEARCH PROGRAM	D	--
G. TRAINING PROGRAM - Formal program of continuing education in trauma provided by hospital for:		
1. Staff physicians	E	D
2. Nurses	E	D
3. Allied health personnel	E	D
4. Community physicians	E	D
5. Prehospital personnel	E	D
H. INTERFACILITY TRANSFERS - Will accept the transfer of all patients who:		
a. Have activated the trauma system by field triage protocols or whom have been directed by Medical Control	E	--
b. Have had their transfers requested appropriately through established interhospital transfer procedures	E	--

Introduction - Prehospital Triage Procedures

These trauma triage protocols will help identify those patients who are most likely to benefit from specialized trauma care. This protocol was designed by the Maine EMS Medical Direction and Practice Board (MDPB), in conjunction with several trauma surgeons from the Trauma Advisory Committee.

Field EMS providers arriving at a trauma scene will communicate with their "On Line Medical Control" (OLMC) physician or PA. In our current EMS system, OLMC is located at the local hospital. It is the OLMC that provides medical control for the EMS field providers. It was the feeling of the MDPB and the Trauma Advisory Committee that OLMC had the best knowledge of the capabilities of their facility at the moment a trauma occurs. For example, a patient with major orthopedic injuries may be appropriately brought to a hospital with an orthopedic surgeon on staff, but should bypass that facility if that surgeon is on vacation or is not available.

The decision to transport directly to a Trauma Center must be made by OLMC.

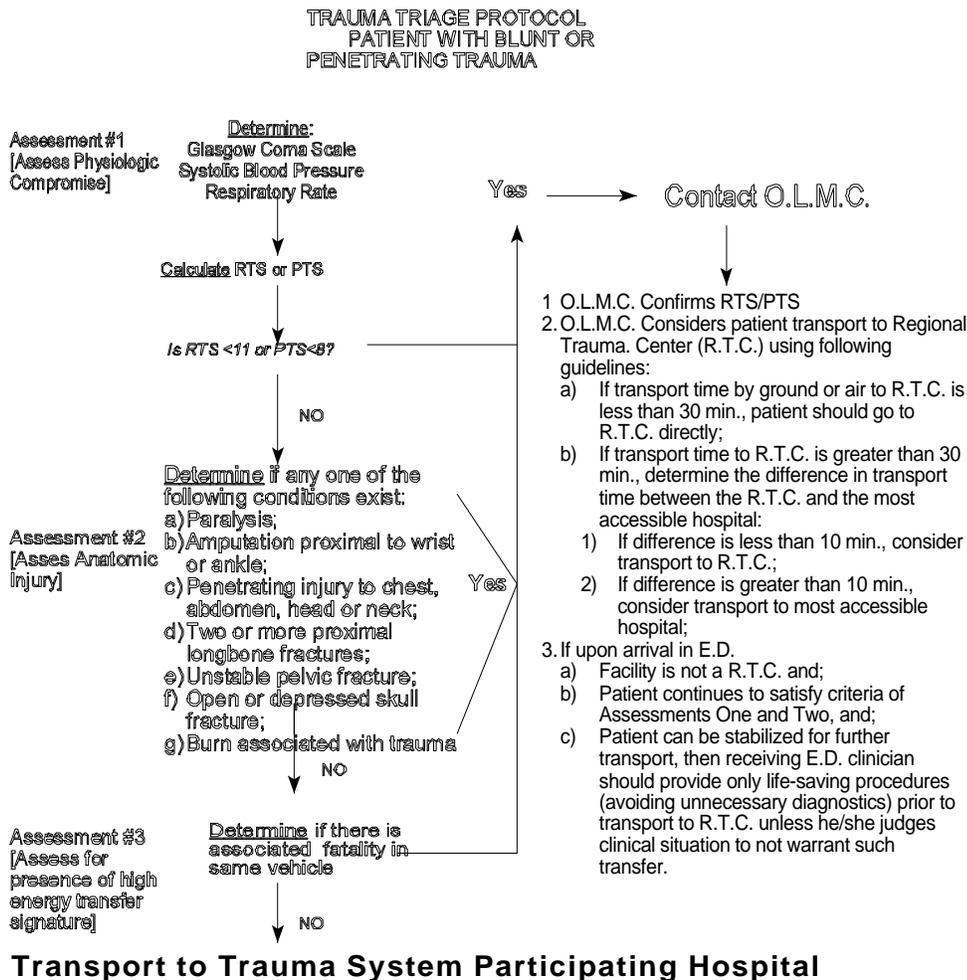
Prehospital Triage Procedures

last revision 17 July 1995

The current Prehospital Trauma Triage Procedure is on page 17. It is a quick reference for prehospital triage, consultation with On-Line Medical Control (OLMC), and possible bypass of the closest hospital. A few specific points regarding these procedures are noted:

1. Any qualified first responder can identify a Major Trauma Victim from these prehospital criteria. Any subsequent decision to bypass the closest available hospital in favor of direct transport to a Trauma Center will then be made by the On-Line Medical Control Officer in communication with the prehospital care providers. Other procedures available through On-Line Medical Control include notification of advanced life support units, activation of transport services, and activation of the receiving hospital's trauma resource team.
2. The initial step of the prehospital provider is to assess vital signs and level of consciousness. The three physiologic parameters listed in Assessment #1 constitute the Revised Trauma Score (RTS). Any noted abnormality in these physiologic scores, or a RTS < 11 or Pediatric Trauma Score (PTS) < 8, indicates a Major Trauma Victim and requires notification of the On-Line Medical Control.
3. Assessment #2, the second step of the prehospital provider, is to evaluate the anatomy of injury. The specific anatomical injuries noted require notification of On-Line Medical Control.
4. Assessment #3, the third step of the prehospital provider, is to determine the mechanism of injury. High energy injury biomechanics by themselves have a reasonably high likelihood of causing significant patient injury. These are indications for consulting On-Line Medical Control for further transport recommendations.
5. Identification of a major trauma victim by the prehospital EMS unit implies that the patient should be taken to a Trauma Center if one is within 30 minutes by either ground or air. If transport time to a Trauma Center exceeds 30 minutes, but the difference in transport times between the Trauma Center and closest facility is less than ten minutes, then initial transport to the Trauma Center should still be considered. However, if transport time to a Trauma Center exceeds 30 minutes and the difference in transport times between the Trauma Center and closest hospital is greater than ten minutes, then initial transport of the patient to the closest hospital should be undertaken unless directed otherwise by On-Line Medical Control.

6. If the airway is in jeopardy and cannot be managed effectively by the on-scene prehospital providers, the patient should be brought to the most accessible medical facility capable of immediate definitive airway management. Alternatively, consideration should be given to coordinating a prompt rendezvous with an Advanced Life Support, (ALS) prehospital unit. A patient directed to the most accessible facility for urgent airway control should continue promptly on to a Trauma Center according to prehospital triage criteria *unless the Emergency Department Physician judges the clinical situation not to warrant such action.*



If pre-hospital providers are unable to definitively manage the airway, maintain breathing or support circulation, begin transport to most accessible hospital and simultaneously request ALS intercept or tiered response.

7. After arrival at any facility, all patients should be evaluated for transfer to a higher level trauma facility based upon the Maine Interfacility Triage Criteria.
8. All patients for whom either the trauma system is activated or On Line Medical Control is consulted will undergo case review.

Introduction - Site survey process for Trauma Centers

Every hospital that wishes to be considered a Trauma Center will undergo a site survey process. This is designed to review the medical capabilities and staff policies, facilities, policies and procedures of the hospital to ensure they are in compliance with Maine EMS Trauma Center requirements. This survey process is also designed to be interactive and educational.

The TAC chose to design this survey and designation process. Using a customized process will afford the most flexibility and control over the process.

Trauma Center and Trauma System Hospital Designation Procedures Last Revision Date: 16 May 1994

1. All hospitals in Maine and selected hospitals in bordering New Hampshire communities will be asked to join the Maine Trauma System. Once the initial request to join the system is sent to a hospital, a response will be required within 90 days. Thereafter, hospitals may request to join the System by contacting Maine EMS.
2. The request will contain:
 - a. The Trauma System Plan (this document);
 - b. An application form; and
 - c. A Trauma Resource Checklist, (derived from Trauma Center Resource Document), to be completed and submitted prior to consideration for site visit).
3. An application fee of \$50.00 will be required to cover the costs of processing.
4. Two or more hospitals may submit a joint proposal and be approved as a single trauma center provided the single-institution criteria are satisfied.
5. All application material will be reviewed by the Maine EMS Trauma Advisory Committee, (TAC). The applying hospital will be notified of any deviations from the minimum standards defined in the Trauma Center Resource Document and will be permitted to resubmit the application for review within 90 days.
6. Applicants who document compliance with the standards as Trauma System Hospitals will be certified by the TAC **without** the need for an on-site review. System hospitals may request an on-site review at their own expense, which may include an educational session at a regularly scheduled conference.
7. Once a Trauma Center applicant has documented compliance with minimum Trauma Center standards, an on-site review by members of the TAC shall be scheduled, (see pages 20 and 22). Reviewing members shall not work in the service area of the applicant hospital. At least one reviewer shall be an experienced site reviewer from out of state agreeable to both the institution and the TAC.
8. A portion of the on-site review shall consist of:
 - a. inspecting the hospital for compliance with minimum standards of equipment, personnel, and organization;
 - b. reviewing medical records, and interviewing appropriate individuals; and
 - c. an exit interview will be provided on the day of the review.

The on-site survey review agenda is further described on page 22.

9. For a hospital requesting designation as a Trauma Center, a written report will be prepared for review by the TAC within 90 days. A hospital which is found not to fulfill requirements for Trauma Center designation will be notified in writing and allowed a second on-site review within one year without reapplication. The applicant will be required to cover the expense of a second on-site review.
10. After designation as either a Trauma System Hospital or a Trauma Center, the hospital will enter into a contractual agreement with Maine EMS for a period of three years. However, the TAC may suspend a hospital's designation at any time if it determines that the hospital has failed to comply with its obligations. The hospital will receive notification of the deficiencies by the TAC. Failure to correct deficiencies in a reasonable period of time will result in revocation or suspension of the designation.
11. All participating hospitals will submit data for inclusion in the state trauma registry for all trauma patients who die, are transferred to hospitals other than Trauma Centers, or who are hospitalized longer than three days (some exclusion criteria likely to be added). In addition, hospital discharge summaries will be provided to the TAC for quality improvement purposes for all patients who die (including DOA) or are admitted to an intensive care unit.
12. All participating hospitals will permit upon request of the TAC review of the medical records and radiology tests of any patient admitted for trauma.
13. Trauma Centers shall not announce the level of their EMS designation for the purposes of public advertising or influencing the flow of trauma patients transported privately outside of the Maine EMS. However, all participating hospitals are encouraged to publicize their involvement in the State Trauma System.

Site Survey Process for Trauma Centers

The pre-survey questionnaire

The site survey process will begin with an information packet and questionnaire sent to all Maine hospitals. These materials will include the Maine criteria for trauma system hospitals and trauma centers, the Maine prehospital triage protocols, the interhospital transfer guidelines, and the quality improvement and education and outreach plans.

The questionnaire will be used to determine a hospital's interest in becoming a Trauma System Hospital or a Trauma Center.

The Application

The application will be sent to all Maine hospitals. Only Trauma Center applicants will be surveyed. However, any hospital that wishes to be surveyed can request a site survey of their trauma program. The details for these system hospital surveys will be developed as interest develops.

If a hospital applies to be a trauma system hospital:

A trauma system questionnaire is sent. If a hospital chooses to become a trauma system hospital, they will answer a few demographic questions and pay a small processing fee. The application is reviewed by MEMS staff.

If a hospital applies to be a trauma center:

The pre-survey questionnaire is sent. The hospital must return the questionnaire to Maine EMS within 60 days. EMS staff will review the application for completeness. If any information is missing Maine EMS will request it from the hospital. The hospital must complete and return the finished questionnaire within 30 days of the request for additional information.

The Survey Team for Trauma Center Applicants:

A survey team will then be assembled by Maine EMS. Survey team members must be acceptable to Maine EMS and the hospital being surveyed. The survey date will be scheduled at a time mutually agreeable to the hospital, Maine EMS, and the survey team. A survey is expected to last a maximum of two days. Typically the survey team will arrive the night before, have an orientation session with the medical staff and perform the survey the following day. The cost of the site visit, including the expenses of the survey team, will be borne by the applicant hospital.

Using the Maine EMS criteria for trauma centers, and reasonably accepted guidelines for trauma care, the survey team will assess the applicant's ability to perform as a trauma center. Important aspects include: availability of general or trauma surgeons, neurosurgeons, orthopedists and anesthesiologists who can respond to the hospital rapidly to care for a multiply injured patient. Emergency physicians who can adequately care for the multiply injured patient. Intensivists, radiologists, nurses, operating room availability and laboratory services.

The survey team will be especially interested in the applicant's implementation of the Quality Improvement Plan as outlined in this document. The Trauma Center / System Hospital QI Plan begins on page 33.

After evaluating the hospital, the survey team will produce a report. The Trauma Advisory Committee, (TAC), will appoint a subcommittee to review the survey report. This TAC subcommittee will include:

- A Maine EMS office staffer;
- a Maine trauma surgeon not affiliated with the hospital being surveyed;

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- a Maine trauma nurse coordinator not affiliated with the hospital being surveyed;
- an emergency physician not affiliated with the hospital being surveyed;
- a hospital administrator not affiliated with the hospital being surveyed. And

This subcommittee will review the pre-survey questionnaire and survey report. The subcommittee will then determine whether the hospital fulfills the criteria to be designated a trauma center.

If the hospital meets the criteria, a certificate is issued. If the hospital does not fulfill the criteria the subcommittee of the TAC will set a timetable for corrective action. Based on the degree of variance from the standards, the subcommittee will decide whether a follow-up survey or a paper report is required. The time to perform corrective action will not exceed six months. If the hospital fails after the corrective action, they may not apply for another year.

System Improvement

During the next two years, the Trauma Advisory Committee will review the criteria for trauma centers and review the performance of the designated trauma centers. The TAC will propose outcome-based performance criteria for trauma centers and assess the trauma centers against these performance criteria.

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On-Site Survey Agenda for Trauma

Centers

For planning purposes, the review will last at least six hours.

- 1. Emergency Department - 30 minutes**
 - a. Review Emergency Department facility, resuscitation area, equipment, protocols, flow sheets, staffing, trauma call.
 - b. Interview emergency physicians and emergency nurses.

- 2. Operating Room/Recovery Room - 15 minutes**
 - a. Interview operating room manager, nursing supervisor, and anesthesiologist
 - b. Check Operating Room schedule

- 3. ICU - 15 to 30 minutes**
 - a. Inspect facility
 - b. Review flow sheets
 - c. Interview nurse

- 4. Radiology - 20 minutes**
 - a. Inspect facility
 - b. Interview radiologist and technician

- 5. Blood Bank/Laboratories/Rehabilitation - MAY BE VISITED**
 - a. Inspect facility
 - b. Interview technicians

- 6. Please allow 2½ - 3 hours for the following:**
 - a. Interviews with a hospital administrator, chief of trauma service, neurosurgeon, orthopaedic surgeons, chief of staff may also be necessary
 - b. Review quality assurance documents
 - c. Patient chart review

- 7. Exit Interview - 45 - 60 minutes**
 - a. Hospital administrator, chief of trauma service, and others as desired

The following should be available at the review

- 1. Listing of hospital's trauma involvement for one year**
 - a. Education - physicians, nurses, prehospital providers, and the public
 - b. Research, copies of submitted articles, protocols of present studies and reprints

- 2. Copy of call schedule for three months prior to review**
 - a. Trauma attending
 - b. Trauma residents
 - c. Neurosurgeon attending

- d. Neurosurgery residents
- 3. Quality Assurance**
- a. Minutes of trauma service meetings for one year
 - b. Quality assurance programs relating to trauma for one year
- 4. Specific trauma patient charts will be requested either before the review or from the Trauma Registry at the time of the review.**

The following people should be available during the survey for interviews:

Hospital administrator, trauma director, emergency department medical director, chief of neurosurgery, trauma nurse coordinator, chief of anesthesia, chief of staff, chief of rehabilitation, chief of orthopedics, chief of surgery, director of critical care unit.

Educational Outreach

Trauma education is a major responsibility for Trauma Centers. The education and outreach program is designed to assist participating Trauma System hospitals and their staffs. Frequent professional dialogue will ensure that all physicians who care for trauma patients have access to the latest medical information. The section that follows describes the educational and outreach portions of the Trauma Plan.

Mission

- ▶ To provide relationships between the participants in the trauma system.
- ▶ To provide educational opportunities for the participants in the trauma system

The trauma system should include four areas of education and outreach to achieve the mission. These are: 1) Exchange programs, 2) Feedback programs, 3) Conferences, 4) Lay education.

1. EXCHANGE PROGRAMS:

a. Physician Exchange

This program would provide for physicians to go from a trauma center hospital to a system hospital to maintain an important capability at the system hospital while the system hospital physician was away. It would also provide coverage and an opportunity for the system hospital physician to go to the trauma center for training and experience. Privileging would be the responsibility of the system hospitals. Remuneration and housing would be negotiated between the physicians involved. The Maine Chapter of the American College of Surgeons would like to serve as a facilitator in such a program when the involved physician was a surgeon.

b. Other Personnel Exchanges

This program would provide for visits by system hospital personnel such as R.N.'s, N.P.'s and P.A.'s to a trauma center for educational purposes. The visitor would be exclusively an observer / student and provide no service. There would be no remuneration. Housing and meals should be provided by the trauma center.

2. FEEDBACK PROGRAMS:

a. System Hospitals

Each system hospital will be responsible for feedback to personnel involved in prehospital care and inter hospital transfers in their geographic area. This can be accomplished in a written form utilizing mail, E-mail, or fax services. It can be done verbally by telephone or with conferencing. Every effort should be made to get the information to the individuals involved in the specific incident. The information should include at least 1) review of prehospital assessment and treatment, 2) review of the communications involved, 3) the hospital diagnosis and therapy, 4) the outcome of the patient. Arrangements and agreements will need to be developed between the hospital and the ambulance units to be consistent with the confidentiality of the patient.

Discussion: This is a very important activity which will be amongst the most difficult to implement. It will be very effective in terms of education and development of close relationships between the system hospital and the ambulance units. The verbal feedback is very time and personnel consuming but is by far the most effective. Written feedback systems can be developed using computer.

b. Trauma Centers

Each trauma center will be responsible for both written and verbal feedback to the system hospital personnel on a patient by patient basis. The written feedback will involve at least the "initial arrival form" and the hospital discharge summary. A quarterly summary should go to the ED director and each involved staff physician. Verbal feedback will involve at least a call back to the transferring physician from the trauma center and a visit once per year by trauma center hospital physicians to the system hospital to review patients.

Discussion: Some of the trauma centers are already active in this in some aspects. The efforts need to be more comprehensive and uniform throughout the state. The "initial arrival form" is important because of the lag until discharge and then a discharge summary. The quarterly summary will be facilitated by the trauma registry. The visit once a year by a physician from the trauma center to the system hospital is ambitious, but important. The trauma hospitals need to help to provide support to the physicians to carry out this charge.

3. CONFERENCES:

a. Trauma Centers

Each trauma center should provide a conference once a year for the local catchment area. The conference should include local problems and issues and general educational topics. The conferences should be open and applicable to all the participants in the trauma system in that area including prehospital, system hospital, and trauma center personnel.

Discussion: This is another version of feedback, but it also allows for individualization of conference materials to meet the needs in each geographic area and for each group of personnel. Care needs to be taken to see that the conferences are truly open and truly applicable in some respects to all of the participants in the trauma system.

b. National

The Trauma Advisory Committee and the trauma centers should facilitate the availability of recognized trauma courses such as ATLS, PHTLS or TNCC. These courses should be held in all parts of the state on a regular basis. Assistance should be provided in scheduling and obtaining faculty for these courses.

Discussion: Currently there is an imbalance where these conferences are available. Typically they are held where the faculty is available. A look should be taken at needs and resources statewide, and establish a better match.

4. LAY EDUCATION:

- a. Each member hospital in the trauma system will be involved locally in education to the public. The trauma centers will serve as resources to the system hospitals in these efforts.

Introduction - Interfacility Transfer Guidelines

Given the rural character of Maine, it is anticipated that some major trauma patients will arrive at Trauma System Hospitals and will need transfer to a higher level of care. The inter-facility transfer guidelines are designed to ensure smooth and efficient transfer of seriously traumatized patients.

Interfacility Transfer Criteria

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Patients identified by interhospital transfer criteria may have increased risk of dying from multiple or severe injuries and their subsequent complications. These patients may be more appropriately treated at a Trauma Center, where multidisciplinary teams accustomed to such patients afford the best outcome. These criteria, while not totally inclusive, have been designed to help identify patients for consideration of transfer early in their Emergency Department or hospital stay, during or after initial resuscitation, but prior to completing a full evaluation and obtaining time-consuming diagnostic tests.

Central Nervous System

- Head Injury
 - Penetrating injury or depressed skull fracture
 - Open injury with or without cerebrospinal fluid leak
 - Altered or diminishing level of consciousness related to trauma (not obviously a result of alcohol or drug intoxication, alone)
 - Lateralizing signs

Spinal cord injury or major vertebral injury

Chest

Wide or suspicious mediastinum (*if Trauma Center has appropriate personnel/facilities*)
Major chest wall injury (e.g. flail chest, open pneumothorax)
Cardiac injury (*if Trauma Center has appropriate personnel/facilities*)
Patients who may require prolonged ventilation

Pelvis

Unstable pelvic ring disruption
Pelvic ring disruption with shock or evidence of continuing hemorrhage
Open pelvic fracture

Major Extremity Injury

Fracture/dislocation with loss of distal pulses
Open proximal long-bone fractures
Extremity ischemia

Multiple System Injury

Head injury combined with face, chest, abdominal, or pelvic injury
Burns with associated injuries
Multiple long-bone fractures
Significant injury to more than two body regions

Coexisting Conditions (which may complicate care)

Elderly or children
Known cardiac, pulmonary, renal, or metabolic disorders (e.g. diabetes)
Pregnancy
Morbid obesity
Immunosuppression

Secondary Deterioration (Late Sequelae)

Mechanical ventilation required
Sepsis
Single or multiple organ system failure (deterioration in central nervous, cardiac, pulmonary, hepatic, renal, or coagulation systems)
Major tissue necrosis

Any Other Specific Situations Referring and Receiving Hospitals Want to Define

e.g. Burns, Hand Injuries, Complex Plastic/Reconstructive, Facial Fractures

Procedure for Interhospital Transfer

last revision 22 March 1995

Decision to Transfer

1. The decision to transfer should be made as early in the patient's evaluation and stabilization as possible, prior to performing an extensive diagnostic evaluation. This decision will be based upon:
 - a. the presence of injuries or illnesses defined in the transferring and receiving hospitals' existing transfer agreement and
 - b. the physician's or PA's assessment of the patient's clinical condition and anticipated clinical course and the appropriateness of the transferring hospital's available personnel and other resources for providing complete care.
2. The decision to transfer will not be influenced by a patient's ability to pay medical expenses.
3. The decision to transfer for urgent advanced level trauma care will not be influenced by a patient's participation in a specific health care provider network (PPO, HMO, etc.).

Decision to Receive

1. A Trauma Center will not refuse the transfer of any trauma patient
 - a. who satisfies the clinical criteria defined in the Trauma Center's existing transfer agreement with the transferring hospital or
 - b. who the primary acute care provider believes requires urgent advanced level trauma care which cannot be provided with the available resources at the transferring hospital.

An exception to this agreement may occur when the Trauma Center has at the time of transfer request a critical shortage in either personnel or other resources which would jeopardize the care of the transferring patient. In such a case the transferring care provider should follow his/her hospital's backup plan to arrange prompt transfer to another qualified Trauma Center.

2. The decision to receive a trauma patient will not be influenced by demands placed upon personnel and other resources at the Trauma Center by scheduled elective or non-emergent operations
3. The decision to receive will not be influenced by a patient's ability to pay medical expenses.
4. The decision to receive for urgent advanced level trauma care will not be influenced by a patient's participation in a specific health care provider network (PPO, HMO, etc.).

Once the Decision to Transfer is Made

1. The transferring provider should obtain permission for transfer from the patient or family if this can be accomplished without delaying transfer. Ideally, the patient will be clinically stabilized prior to transfer. However, in the situation where delay for further attempts at stabilization are deemed by the primary acute care provider and the trauma center physician to be a greater risk than urgent transfer to a higher level of trauma care, the primary provider should document this fact and not delay transfer.
2. Notify EMS to arrange prompt transport
3. The transferring primary acute care provider will complete a thorough primary and secondary survey but should not delay interhospital transfer in order to obtain further diagnostic tests which will not significantly influence the initial resuscitation (e.g. CT scan, extremity radiographs, complete C-spine series).
4. The transferring care provider will call a single specified telephone number at the Trauma Center. This number will be clearly posted in the Emergency Department resuscitation area.
5. At the Trauma Center the call will be directed to the Trauma Officer. A standardized log of the conversation will be recorded, including at least the name of the conversants, date, and time.
6. The transferring care provider will present the patient in a standard format:
 - a. Care provider's name, title, hospital, and telephone number
 - b. Patient's name, age, gender
 - c. History/mechanism of injury including date and time
 - d. Condition reported at the scene and en route to ED
 - e. Condition upon ED arrival including BP, P, RR, Temp, RTS, GCS
 - f. Current condition
 - g. Initial diagnoses
 - h. Diagnostic tests if available:
 - i. Hct/Hb, ABG, urinalysis or urine dipstick
 - ii. CXR, lateral C-spine, pelvis
 - iii. other pertinent
 - i. Treatment rendered:
 - i. IVS - size and location
 - ii. IV fluids - type and amount, current IV rate
 - iii. Status/quality of airway/breathing
 - iv. Tubes - ETT, chest tube, Foley, nasogastric, etc.
 - j. Pertinent medical history, medications, allergies
 - k. Anticipated time of departure
 - l. Estimated time en route

7. The Trauma Center trauma officer will ensure that the above information has been accurately received and will clarify the report if necessary. The trauma officer should provide advice regarding options for transportation, timing of transfer, further pre-transfer stabilization, and the need for any additional diagnostic tests.
8. The Trauma Center physician will notify and assemble in a timely manner the personnel and other resources necessary to optimally receive the transferred patient. *(Each Trauma Center should define its own criteria for what situations warrant trauma team mobilization i.e. general surgeon, respiratory therapist, radiology, blood bank, etc.)*
9. The following minimum material will be provided in a timely manner to the Trauma Center (this may accompany the patient or be sent by FAX but should never delay transport):
 - a. A completed trauma transfer summary, which will become part of the medical record at the Trauma Center
 - b. A copy of the initial EMS prehospital run sheet
 - c. A copy of the complete or pertinent medical record
 - d. A list of all medications given - dose and time
 - e. I+O, vital sign flow-sheet with total IV fluids
 - f. All available laboratory test results and ECG
 - g. All radiographs (transfer should not be delayed to make copies)
 - h. Appropriate patient transfer forms as required under COBRA/EMTALA

Any test results not available at the time of transfer should be forwarded to the Trauma Center within 24 hours.
10. When the patient leaves its facility the transferring hospital will call the Trauma Center to report the time of departure, mode of transportation, and estimated time en route. The trauma transfer form will then be sent by FAX to the Trauma Center.

After Arrival at the Trauma Center

1. After the patient's disposition from the emergency department has been determined, the trauma physician or their designee, will call the transferring primary acute care provider at the previously recorded telephone number and provide the following information:
 - a. Patient status, current diagnoses, initial evaluation/therapy
 - b. Name and telephone number for the admitting attending physician
2. The transferring care provider should be welcome to contact the attending trauma physician or the trauma nurse coordinator at any time for further discussion.
3. The transferring care provider listed on the trauma transfer form will receive a copy of the patient's discharge summary.

Maine State Trauma System Transfer Summary

last revision 30 January 1995

Date: _____

Transferring Hospital: _____

Primary Provider: _____ Phone: _____

Receiving Hospital: _____

Receiving Physician: _____

Patient Name: _____

Age: _____ Gender: M or F

Date/Time of Injury: _____

Mechanism of Injury: _____

Condition at Scene and En-route to ED (VS, level of consciousness): _____

Time of ED Arrival: _____

Condition upon ED arrival (including VS, GCS): _____

Condition at transfer (including VS, Temp, GCS): _____

Preliminary Diagnoses: _____

Test Results

Hematocrit: _____

ABGs: _____

Grossly bloody urine?: Yes or No

X-rays

AP Chest: _____

Others: _____

Other Pertinent Data: _____

Treatment Rendered

IVS (size, location): _____

Total Fluids

Intake

Crystalloid: _____

Blood: _____

Other: _____

Output

Urine: _____

Other: _____

Current IV rate and composition: _____

Airway (quality or airway/breathing, O₂ setting): _____

Tubes (ETT, chest tubes, Foley, nasogastric, etc.): _____

Pertinent Medical History: _____

Medications: _____

Allergies: _____

COBRA Forms Completed: Yes or No

Accompanying Patient

- A copy of the initial EMS prehospital run sheet
- A copy of the complete or pertinent medical record
- A list of all medications given - dose and time
- A copy of I+O, VS Flow-sheet
- All available laboratory test results and ECG
- All radiographs (transfer should not be delayed to make copies)

Person to whom feedback should be directed: _____

Department: _____ Phone: _____

Time of Departure: _____

Summary completed by: _____

The Quality Improvement Program - Introduction

The quality improvement program is designed to measure and improve the quality of trauma care in Maine. Using a Total Quality approach, the QI program is designed to stimulate continual improvements in trauma care throughout the system.

Responsibilities of Trauma Centers and System Hospitals

This section is background material for the attached Tree Diagram (page 35), which represents in graphic form the responsibilities of both a Trauma Center and Trauma System Hospital. This effort, begun in March, 1995, is an evolving work produced by the State Trauma Quality Team of the Trauma Advisory Committee.

Team members included:

Team Leader - Larry Hopperstead, M.D.
Central Maine Medical Center.
Pret Bjorn, R.N., Eastern Maine Medical Center
Mary Day, Eastern Maine Medical Center
Rick Petrie, EMT-P, Maine EMS
Lance N. Tucker, Tri-County EMS

Marideth Beals, R.N., Maine Medical Center

Jay Bradshaw, EMT-P, Maine EMS
Cathy Moss, R.N., Maine Medical Center
Cindy Scribner, R.N., Central Maine Medical Center

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Trauma System Goals and Responsibilities - Tree Diagram

This is a graphical depiction of the interrelationship of Trauma System goals and responsibilities. See Figure 2 page 35.

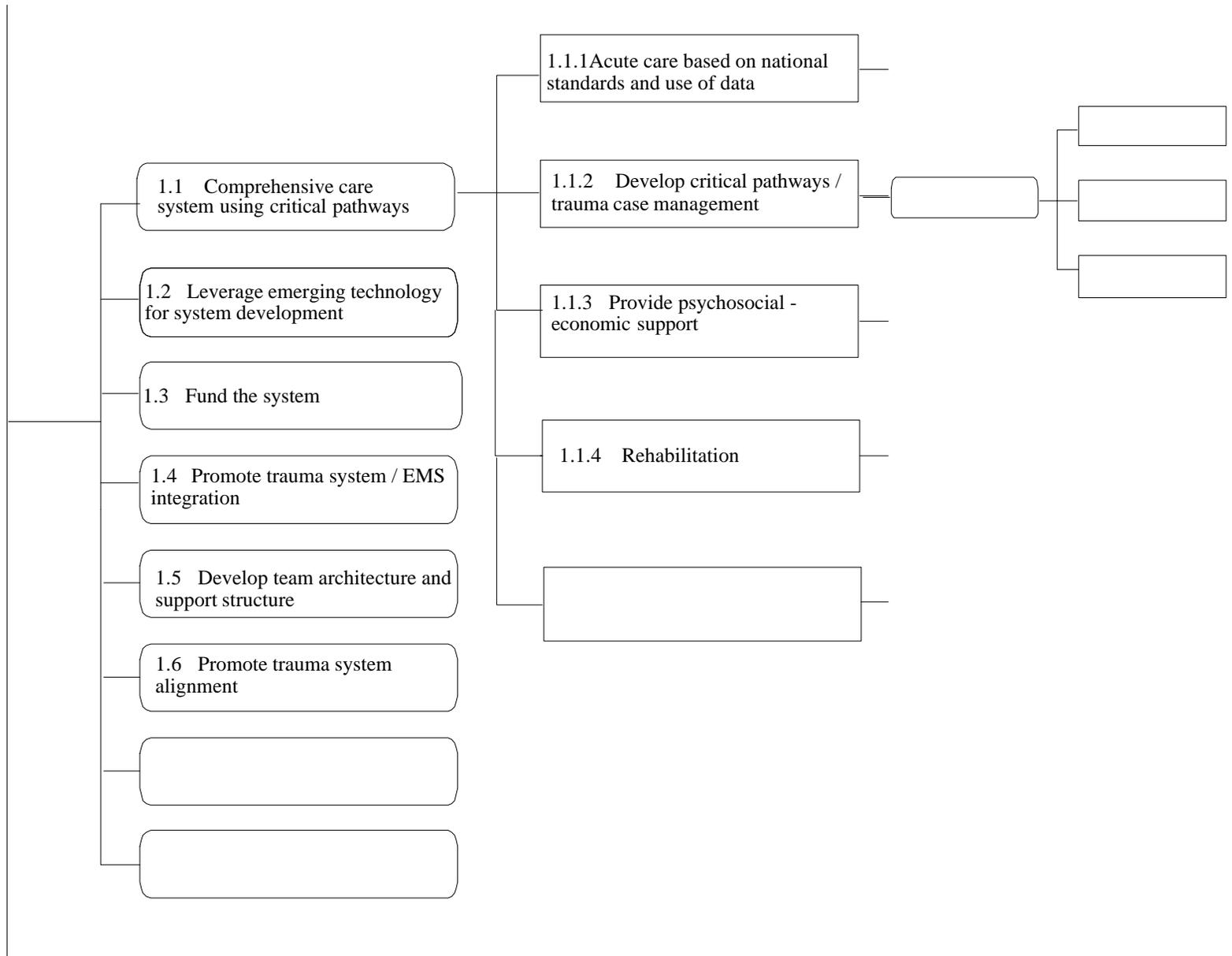
The “Responsibilities” are outlined in what is known as a *Tree Diagram*. The diagram works outward (horizontally) from major broad branches (Strategic Goals) to ever smaller branches defining relational aspects of those goals at a level of ever-increasing specificity. (See Figure 2, page 35, for an example.) Careful evaluation defines categorical relationships within those strategic goals, and will describe specific **responsibilities**, tasks, or operations necessary to fulfill or achieve those goals.

In reflecting upon what aspects of the Trauma System would have direct impact on your institution or on what would be expected of you as an institution, consider which of the “tree diagrams” is applicable to your hospital. Then, for any Strategic Goal, follow the breakdown into “strategies”, and then “tasks” or “work efforts”, out to the right. A good example of the different levels of responsibility and work can be seen by looking at **Strategic Goal #3 : DATA Management** on the two tree diagrams:

- Look at **Strategy 3.1** ---”Develop a Central DATA Maintenance System”
Trauma System Hospitals are expected to show commitment, have trained personnel, and submit data via state-provided forms and/or software.
Trauma Centers, on the other hand, are expected *to train* the data personnel of the region and to provide Trauma Nurse Coordinator back-up to the region, in addition to maintaining their own institution’s data.
- Look at **Strategy 3.2** — “Conduct DATA Analysis on Process and Outcomes”
Here, there is no direct responsibility of the Trauma System Hospitals. The Trauma Centers, on the other hand, have the enormous and all-important responsibilities of identifying criteria for data collection regionally, identifying data sets and fields, collecting and analyzing the data, and finally, disseminating the analysis / information back to the system via feedback mechanisms. These responsibilities are consumptive of both time and personnel, which is why they fall exclusively within the domain of Trauma Center.

In Summary:

Similar comparisons or analyses of the “tree diagrams” follow the same approach, and deserve your scrutiny. The approach is very straightforward. These “Tree Diagrams” are *documents-in-evolution*, but they define for now what the Quality Team of the Maine Trauma Advisory Committee feel are the best delineation of the responsibility commitments of the two broad categories of hospitals to the developing statewide **Trauma System**. Sections that follow detail each item or entry in the Tree Diagrams.



Responsibilities of a Trauma Center - Tree Diagram

1 **Quality Improvement for Trauma Centers - Provide Institutional Support, Structure, & Organization to Promote Quality & Future Growth**

1.1 Comprehensive Care System Using Critical Pathways

The delivery of trauma care requires an organized systematic approach to effect optimal outcomes. Trauma Centers must have the following key criteria in place to meet this objective.

1.1.1 Acute Care Based on National Standards and Use of Data

National standards have been incorporated into the criteria for Trauma Centers and Trauma System Hospital requirements and responsibilities. In addition, ongoing data analysis will drive further refinements in the care system.

1.1.2 Develop Critical Pathways / Trauma Case Management

Trauma Nurse Coordinators are required at all Trauma Centers and provide Case Management for trauma patients. Critical pathways describe the expected care outcomes.

1.1.3 Provide Psycho-Social-Economic Support

Trauma centers have an obligation to provide initial and ongoing support for trauma patients and their families.

1.1.4 Rehabilitation

Relationships and/or transfer agreements with rehabilitation facilities are in the continuum of trauma care.

1.2 Leverage Emerging Technology for System Development

The sharing of information regarding issues is a requirement for continued system development. Technology is critical to supporting this objective.

1.2.1 Clinical Technology

Minimum required technology for clinical services is detailed in the resource document. The sharing of information regarding clinical issues is a requirement for continued system development. Technology is critical to supporting this objective.

1.2.2 Technology for Communication

Trauma Centers must have uninterrupted telephone and/or radio access to support direct medical control. Fax capability is also required. A centralized communication center, although not required, would also enhance the coordination of patient movement through the system.

1.2.3 Technology for Education

Trauma Centers should make every effort to share educational presentations with system hospitals. This may be done real time with an interactive video network or on a delayed basis via video taping.

1.3 Fund the System

Trauma Centers make a commitment to provide a minimum level of service to the surrounding community and the state. The commitment has financial implications as follows:

1.3.1 Funding for Clinicians

Trauma Centers must provide funding for positions, i.e. Trauma Director, Trauma Coordinator, Trauma Registrar, education of all providers of trauma care, and essential equipment as outlined in the Resource Document.

1.3.2 Funding for Data Collectors

Additionally, Trauma Centers must maintain the computer hardware and software to support the Trauma Registry. Trauma System Hospitals are obligated to provide data and as such must fund the position for data collection.

1.4 Promote Trauma System / EMS Integration

Each Trauma Center shares equal responsibility with other EMS organizations to promote total system integration. State trauma and EMS systems must be seen as one seamless web, each a part of the same continuum that exists to provide national gold standard trauma and emergency medical care to our communities.

1.4.1 Develop Medical Control

Trauma Centers will be responsible for ongoing quality improvement of On-line Medical Control. Protocols for Medical Control have been described by Maine EMS on a statewide basis. It will be required of Trauma Centers to demonstrate compliance with these protocols. Trauma Centers will be required to provide 24-hour availability of a licensed Maine physician able to immediately participate in On-Line Medical Control.

1.4.2 Implement Triage & Interfacility Transfer Protocols

Each Trauma Center will be responsible for implementation and ongoing quality improvement of Triage Protocols. Prehospital Triage Protocols have been developed by the Maine EMS Physician Advisory Board..

1.4.3 Support the Pre-Hospital System

It is the responsibility of the Trauma Center to take an active role in developing and cultivating the prehospital emergency medical system within their service area. There should be a comprehensive disaster management program (1.4.3.1) in place utilizing the New England Council for Emergency Medical Services (NECEMS) blueprint. Initial pre-hospital education is necessarily very generic in order to cover the many topics in a reasonable period of time. A strong effort should be made to increase the trauma capabilities of the pre-hospital personnel through continuing education, clinical site availability, development of peer support programs, and allocation of Trauma Center personnel for educational purposes (1.4.3.2). The Center should recognize the importance of crisis intervention for all pre-hospital and in-hospital staff (1.4.3.3) and should support the regional CISD team with educational, financial, and administrative assistance.

1.4.4 Develop Transportation Systems

Each Trauma Center should assure adequate air transportation service by either establishing a service where there is none or setting up agreements with an existing service (1.4.4.1). It is important to recognize that the primary area of training and education for pre-hospital personnel is in the emergency response arena. Trauma Centers should work to augment existing pre-hospital education in order to develop better interfacility transport teams (1.4.4.2).

1.5 Develop Team Architecture and Support Structure

Trauma Centers as leaders in trauma care within their geographic area have a unique responsibility to promote a team environment based on trust, sharing of data, and collaboration of all members of the trauma multidisciplinary team. To assist the work of teams within each area, the Trauma Centers need to promote the support structure and resources needed for the team architecture.

1.5.1 Appropriate Resources (Coverage & Services)

Trauma Centers need to provide trauma care providers with the appropriate resources, including real time consultation, specialty coverage, and coverage of providers.

1.5.2 Develop Active Trauma Committee

Each Trauma Center will have an active Trauma Committee in accordance with ACS guidelines. This multidisciplinary team should be the focus of trauma leadership within each geographic area.

1.5.3 Promote Team Skills/Tools/Organizational Learning

All multidisciplinary trauma teams should display the characteristics of, and practice the required skills of effective teams. This includes, but is not limited to, team tools for problem solving, process improvement, project management, and organizational development. The goal should be organizational learning so that no one organization or team members be "left behind" in the process. In order for an entire system to mature and develop, all members of the team must contribute and be involved.

1.6 Promote Trauma System Alignment

As leaders of trauma care within their respective geographic area, trauma centers have an obligation to promote total system alignment, both vertically and horizontally. Major efforts in attaining system alignment should be the development and deployment of a comprehensive strategic and quality improvement plan, development of systems for provider feedback, and a sharing of resources for education.

1.6.1 Develop and Deploy a Plan with Maximum Involvement

Trauma Centers should develop and deploy a plan for long term system development and quality improvement. This plan should be developed within the context of the trauma team architecture so that it reflects the needs and contributions of all multi-disciplinary team members.

1.6.2 Willingness to Accept All Patients

Trauma Centers provide around the clock trauma services to all patients without regard to race, gender, age, mechanism of injury, or ability to pay.

1.6.3 Develop Feedback Programs

Trauma Centers will assist in the development of provider feedback mechanisms. This should include immediate telephone calls and eventual written feedback. Feedback is recognized as the *sine qua non* for system-wide quality improvement.

1.6.4 Share Resources/Promote Research & Education

Trauma Centers will share resources both system wide and within their respective geographic areas for trauma research and education. The education part of trauma system development is so

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crucial that it warrants special emphasis as a major responsibility in its own right; please see Strategic Goal 2.0 series in this manual.

2 Quality Improvement for Trauma Centers - Education

2.1 Create an Environment of Openly Shared Clinical Learning for Education and Training

The complexity of trauma management demands an on-going commitment to education and training specifically directed at trauma issues. Equally as important, is a willingness to share clinical experiences and understandings across the entire fabric of the trauma care system. Such a willingness can lead to optimization of the educational opportunities inherent in clinical events, and can evolve only in an environment of mutual trust and respect.

2.1.1 Meetings to Discuss Issues/Concerns/Needs

A trauma care system plan must include the ability of the system to monitor its own performance and to assess its impact on trauma morbidity and mortality. Therefore, regularly scheduled meetings should occur between Maine EMS (lead agency) and representatives assigned by the Trauma Advisory Committee to discuss issues identified through the Quality Improvement process: monitoring of state identified audit filters, patient needs and outcomes and system resources etc. In this way trauma care management deficits can be identified and appropriate changes can be made to allow for the continual development and improvement of the system.

2.1.1.1 Care Standards

The Maine Trauma System plan has established standards of care according to ACS and ACEP guidelines for trauma centers and trauma system hospitals including resources and equipment.

2.1.1.2 Regularly Scheduled Education

Regularly scheduled meetings between trauma directors, trauma nurse coordinators, trauma surgeons, ED nurses, and pre-hospital providers should occur monthly to discuss quality patient care.

2.1.1.3 Informal Meetings

Impromptu meetings between trauma director and other trauma personnel should occur on an as needed basis depending on severity of the issue.

2.1.2 Conduct Clinically-Related Training as needed (Just-In-Time)

Collaborative practice rounds should occur weekly and on an as needed basis.

2.1.2.1 Pre-hospital Providers

Involvement of Pre-hospital Providers in case review presentations should occur as appropriate on a regular basis.

2.1.2.2 Nurses

Involvement of Nurses in case review presentations should occur as appropriate on a regular basis.

2.1.2.3 Physicians

Involvement of Physicians in case review presentations should occur as appropriate on a regular basis.

2.1.2.4 Ancillary Personnel

Involvement of Ancillary Personnel in case review presentations should occur as appropriate on a regular basis.

2.1.3 Conduct Case Reviews

Quality improvement activities should include prospective and retrospective case reviews that may be injury specific, triggered by audit filters, randomly selected, or based on monthly morbidity/mortality conferences. These reviews should involve all appropriate disciplines and are necessary to monitor and assess the facility's ability to comply with pre-established standards.

2.1.4 Conduct Trauma Conferences

Trauma conferences should be open to all trauma disciplines for educational purposes to prepare personnel for the delivery of quality patient care based on ACS guidelines.

2.2 Support Formal Trauma Education Courses

The Trauma Centers have unique responsibility in providing formal trauma education and consequently must facilitate the availability of national courses such as ATLS, PHTLS, ABLIS, PALS, and TNCC. These courses should be held in all parts of the state on a regular basis. Assistance should be provided in scheduling and obtaining faculty for these courses.

2.2.1 Establish Regional Education Programs

Each trauma center should provide a conference once a year for the local service area. The conference should include local problems and issues as well as general educational topics. The conference should be open and applicable to all trauma care providers including pre-hospital, system hospital, and trauma center personnel. Other programs should be established within the region. For example, a physician exchange program. This program would provide for physicians to go from a trauma center to a system hospital to maintain an important capability at the system hospital while the system hospital physician was away. It would also provide coverage and an opportunity for the system hospital to go to the trauma center for training and experience. Privileging would be the responsibility of the system hospitals. Remuneration and housing would be negotiated between the physicians involved. The Maine Chapter of the American College of Surgeons would like to serve as a facilitator in such a program when the involved physician was a surgeon. Other personnel exchanges would include visits by system hospital personnel such as RN's, NP's, and PA's to the trauma center for educational purposes. The visitor would be exclusively an observer and student and provide no service. There would be no remuneration. Housing and meals should be provided by the trauma center.

2.2.2 Provide TNCC Courses

TNCC is a verification course providing core-level trauma knowledge and psychomotor skills associated with the delivery of professional nursing care to the trauma patient. This program was developed and sponsored by the E.N.A. and should be made available to nurses throughout the state.

2.2.3 Support and Participate in ATLS Courses

ATLS is a course developed and sponsored by the American College of Surgeons for physicians which covers trauma knowledge and skills. It is considered an optimum standard for trauma care physicians and physician extenders directly involved in the resuscitation of the injured patient. The Trauma Advisory Committee and the trauma centers should facilitate the availability of this course throughout the state.

2.2.4 Support and Participate in Pre-Hospital Education

Trauma Centers must provide leadership in EMS Provider trauma education and training. Some courses available to EMS providers include:

PHTLS a course for prehospital care providers that teaches concepts of basic and advanced trauma life support.

PALS Pediatric Advanced Life Support is a national level course that teaches the concepts of advanced life support for infants and children

PABLS Prehospital Advanced Burn Life Support

2.2.5 Annual Trauma Symposium

Each trauma hospital will support trauma personnel to attend annual trauma symposium in order to complete CME or CEU/CEH requirements.

2.2.6 MCOT

The Maine Committee on Trauma meets semiannually and is an excellent forum for the discussion of trauma care issues..

2.2.7 Network with other organizations such as ACEP, ACS, ENA, AACN, and the Maine Paramedic Association

All trauma care providers share a responsibility to be involved with their peers.

2.3 Support Informal Education and Training

Trauma Centers are expected to provide and support ongoing informal education for all professionals involved in care of injured patients.

2.3.1 Encourage Inter-Provider Discourse

The Trauma Center should provide for regular and inclusive discussions of clinical and Trauma System topics. Such forums should focus on improving communication and collaboration among various services and disciplines in order to achieve maximum quality and efficiency along the continuum of trauma care. Inclusion of hospital staff in EMS Quality Improvement updates related to trauma care, is one example of compliance with this condition. Participants in these reviews should be reminded of the confidential nature of the material discussed as it relates to specific individuals. While it may be useful to the Trauma Centers or their affiliates to record minutes at these sessions, the Trauma System Quality Improvement team requests only that Trauma Center keep a comprehensive log listing the date, time, topic, and list of participants for each session.

2.3.2 Conduct Informal Talks About Specific Runs / Events

Trauma Centers must be able to demonstrate a willingness and ability to discuss clinically important cases and events with pertinent personnel as the opportunity arises. Compliance with this requirement includes impromptu case discussions in real time, such as a brief review or critique of an Emergency Department case with the transferring or transporting crew. Participants in these reviews should be reminded of the confidential nature of the material discussed as it relates to specific individuals. These sessions may be logged with events described in Section 2.3.1, provided the informal nature of the discussion is noted.

2.3.3 Identify Specific Contact Nurses for Trauma Education

Each Trauma Center must identify one or more members of the nursing staff possessing adequate experience and interpersonal skills to ensure optimum inter-provider education as described throughout this section. It will be the responsibility of this nurse to maintain a list of contacts at all referring hospitals and EMS units, and to act as a resource to these providers for the purposes of *ad hoc* education and follow-up.

2.3.4 Establish Training Mentorships

Trauma Centers, individually or cooperatively, construct, promote, and provide clinical mentorships for Physician and Nursing staff of other Trauma System Hospitals. Reasonable goals and objectives of these Mentorships, as well as minimum qualifications and fees for participants, may be devised by the Trauma Center, provided that the resulting program demonstrates usefulness to the region.

2.4 Conduct Simulation Training

Trauma Centers must conduct simulation training commensurate with the needs of the region to ensure adequate preparation for a variety of volume, acuity, and types of cases. The format and frequency of such programs is at the discretion of the Trauma Center, provided that each of the following is adequately documented and demonstrated:

- Participation of multiple providers and services within the region;
- Exercise of a reasonable variety of Hospital, Regional, and State Trauma Care Protocols;
- Case simulation reflecting high-risk, high-volume, or problem-prone patient types;
- Varying selection of dates and times to ensure maximum exposure of staff to the simulations.

Frequency of simulations sufficient to suggest participation of all Trauma Center staff in at least one simulation annually. In addition, the simulation training program must include the following, each at a minimum of one simulation annually. Simulations listed in 2.4.1 and 2.4.2 may be combined with 2.4.3 or 2.4.4 as needed to fulfill the requirement. These simulations may be simultaneous with those required by other hospital functions, such as disaster planning. Regardless of the primary purpose of any simulation, each exercise must be documented and reviewed by the Trauma Center's Trauma Committee (*see Section 1.5.2*) in order to meet the requirements of Section 2.4.

2.4.1 Planned Simulations

In planned simulations, it is permissible for participants to be advised in advance of the nature and timing of the simulation. Such simulations are encouraged to permit inclusion of specific personnel (e.g. a desired staff member) with advanced notice. They may also be useful to teach new or infrequently-utilized processes and protocols to staff. For the purposes of fulfilling the Trauma Center requirement for this section, a Planned Simulation may be replaced by an additional *No- Notice Simulation* (*see Section 2.4.2*).

2.4.2 No-Notice Simulations

No-notice simulations may be useful in testing the true preparedness of the Trauma Care Team in a given region. This simulation is planned and implemented as a surprise exercise, and is used to measure the functional and educational needs of the Trauma Center as well as to train the staff involved.

2.4.3 Full-System Simulations

While any trauma simulation may be devised specifically for the needs of a given unit or service (e.g., the Emergency Department), it is important that at least one simulation annually test the

integration of the full Trauma Care System of the region, from the scene to the Trauma Center by way of a Trauma System Hospital. The purpose of this exercise should be to examine the implementation of Medical Control, Triage, Transfer, and Communication Practices among regional facilities and services. Full-System Simulations should be designed to include a different TSH for each exercise, except as indicated for correction of problems identified.

2.4.4 Mass-Casualty Simulations

Mass-Casualty Simulations may be organized in concert with local Emergency Management Agencies. The purpose of such exercises should be to test the operation of existing regional systems in the event of excessive volume of high-acuity cases. In the event that Mass-Casualty Simulations are required by the Trauma Center for other clinical or regulatory needs, the simulations may be used to fulfill both requirements simultaneously.

2.5 Documentation of Meetings and Educational Experiences

In order to maintain, review, promote, and improve the educational functions of the Trauma Center, it is necessary to document and demonstrated the following in addition to those requirements previously described.

2.5.1 Educational Administrative Support Team

The Trauma Center should enlist its Education and Training Staff to assist in the design and updating of all educational programs previously described. These personnel are especially needed to ensure comprehensive Quality Improvement and accreditation of the educational services of the Trauma Center, and their participation in such efforts should be explicit.

2.5.2 Organizational Learning

Each Trauma Center should be able to provide, annually and on request, a listing of major institutional needs identified as necessary to the mission of the Trauma Center in the region. This itemized document should also include a problem analysis, list of actions taken, and plan for future reassessment and intervention. This requirement may be met, for example, by a satisfactory institutional Quality Improvement plan. This section is included to emphasize aggressive Continuing Quality Improvement as a foundation for the Maine Trauma Care System at each level.

2.5.3 Needs-Based Education

Each formal educational offering undertaken by the Trauma Center should include a needs assessment. Such documentation should be sufficient to justify the purpose of the program beyond its requirement under the Maine Trauma Care System Plan. Examples would include topics identified by institutional or system Quality Improvement, new products, services, or protocols adopted by the Trauma Center; or personnel updates.

2.5.4 Follow-Up

3 Quality Improvement for Trauma Centers - Monitor the Process & Outcomes of Trauma Care to Ensure Quality, Efficacy, Cost Effectiveness, & Timeliness

3.1 Develop a Central Data Maintenance System

Each Trauma Center will maintain a trauma registry. A subset of the data collected will be downloaded to Maine Emergency Medical Services for inclusion in its System Trauma Registry.

3.1.1 Institutional Commitment & Support for the Trauma Registry

A successful data system must have the support of the trauma center's administration and staff. The facility needs to have trained personnel, computer resources, and access and ability to collect the necessary data.

3.1.2 Identify and Train the People to Support the System

Each Trauma Center will identify individuals who will be trained in gathering data and entering same into the hospital trauma registry, and generating standard reports and responding to ad hoc queries and reports.

3.1.3 Acquire and Maintain the Hardware to Support the System

The trauma registry requires a personal computer (IBM or true compatible). Minimum recommended system requirements: 386 or 386SX (486 or 486SX highly recommended) with 4 MB RAM 40 - 110 mb available on Hard Disk Floppy disk drive (5 1/4" or 3 1/2")VGA resolution (color highly recommended) DOS 5.0 or 6.0 (preferred)

3.1.4 Acquire and Maintain the Software to Support the System

Maine Emergency Medical Services will provide, at no charge, a copy of Hospital Trauma Register (HTR). All trauma centers will use HTR, or an acceptable substitute as approved by Maine EMS for their trauma registry. Maine EMS will maintain the license for HTR. Trauma centers will also be provided with one copy of dBASE IV for their own use. Upgrades of dBASE will be the responsibility of the trauma center.

3.2 Conduct Data Analysis on Processes and Outcomes

Using hospital oriented criteria equivalent to those defined by the Centers for Disease Control, retrospective analysis of trauma cases will be conducted on process and outcomes to determine compliance with or deviation from National Standards.

3.2.1 Identify Criteria for Data Collection

Any patient whose injuries are described by ICD-9-CM N-codes 800.00 through 959.9 plus any of the following:

- Transfer from another facility;
- Admission to intensive care;
- Hospitalization for three or more days; or
- Death.

3.2.2.2. Identify the Data Set and Fields

Required data for the Registry would include Social Security number, law enforcement record number, Prehospital record number, Hospital Medical Record number and Emergency Department

admission date. Fields would include prehospital scene to hospital run times, vital signs, place and mechanism of injury.

3.2.3 Collect and Analyze the Data

In addition to Prehospital data as described in 3.2.2, response times of physicians, vital signs and length of stay in the Emergency Department, admitting physician, diagnoses codes, procedures performed, injury severity scores, outcomes, and disposition will be collected. Analysis will be conducted to determine if length of stay, outcomes, and response times are appropriate.

3.2.4 Communicate the Analysis/Information throughout the System

Report at regular intervals or as requested to Hospital Administrators, Trauma Service Administration/Clinicians, Hospital Quality Assurance Committees, and Systems Trauma Registry.

3.3 Conduct Data Analysis of Individual Cases on a Routine Basis

Trauma centers will routinely conduct data analysis of individual cases to determine compliance with or deviation from National Standards.

3.3.1 Screen all Trauma Patients

Audit filters are used by trauma systems to examine the timeliness, appropriateness and effectiveness of care delivered to an individual patient. We are currently using ACS suggested filters and morbidity complications for our review process.

3.3.2 Conduct Informal Reviews

All patients that meet inclusive criteria are followed prospectively until discharge and monitored for complications, timeliness of therapies, and appropriateness of care.

3.3.3 Conduct Formal Case Reviews

Each month a quality improvement summary is obtained by trauma coordinators and all patients with variances are flagged and formally reviewed by the trauma care providers. An action plan is developed and information is shared with the appropriate personnel.

3.3.4 Conduct Trauma Conferences

When there is a variation from the standard of care, or when trends appear, a corrective action plan is developed and shared in a trauma conference where resolution of the issue is accomplished by education and/or a change in policy. Minutes of the conference should be taken.

3.4 Develop Provider & Referral Feedback Mechanisms

Each trauma center will develop and maintain provider and referral feedback mechanisms for quality improvement.

3.4.1 Establish Minimum Information for Feedback

Each System Hospital will be responsible for feedback to personnel involved in prehospital care and interhospital transfers in their geographic area. This can be accomplished in a written form utilizing mail, e-mail or fax services. It can be done verbally or with conferencing. The information should include at least the following:

- Review of prehospital assessment and treatment;
- Review of communications involved;

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- The hospital diagnosis and therapy; and
- Outcome.

Every attempt should be made to contact the individual involved in the incident or a specified contact person.

3.4.2 Identify Communication Flow for Feedback Information

Once the patient has been settled, the receiving physician or a designated individual will call the transferring primary acute care provider at the previously recorded telephone number and provide the following information:

- Patient status;
- Current diagnosis; and
- Initial evaluation / therapy.

The transferring care provider should be welcomed to contact the attending physician or trauma coordinator at any time for further discussion. The transfer physician will receive a copy of the patient's discharge summary.

3.4.3 Identify Protocols & People to Provide the Feedback

Trauma Centers are responsible for developing and maintaining appropriate mechanisms for providing feedback to trauma providers.

4 Quality Improvement for Trauma Centers - Have a "Public Voice" & Support the Community

4.1 Support and Involvement in Public Education

Trauma centers will support and be involved with public education not only within the geographic area but also on a state and national level.

4.1.1 Injury Prevention Education

Trauma Centers should be in the forefront of injury prevention education with the State.

4.1.2 Group Discussion of Issues

Trauma Centers should lead the clinical discussions as appropriate for public education.

4.2 Input for Public Policy

Trauma Centers should play an active role in shaping public policy.

4.2.1 Prevention / Safety Issues

Trauma Centers should promote prevention and public safety issues. For example:

- A mandatory Seatbelt Law;
- A mandatory Motorcycle Helmet Law.

4.2.2 Mandatory Autopsy

Trauma Centers should actively promote the development of mandatory autopsy within the State.

4.2.3 Emerging Issues (support for the system)

Trauma Centers should be aware of emerging trauma issues and actively organize for influence within the public debate.

1 Quality Improvement for System Hospitals - Provide Institutional Support, Structure, & Organization to Promote Quality & Future Growth

1.1 Develop a Comprehensive Care System

National standards have been incorporated into the criteria for Trauma Centers and Trauma System Hospital and requirements and responsibilities. Trauma Nurse Coordinators are required at all Trauma Centers and provide Case Management for trauma patients. Critical pathways are guidelines for the care of trauma patients and are being developed. Relationships with rehabilitation services are in place and are critical in the continuum of trauma care.

1.1.1 Acute Care Based on National Standards and Use of Data

1.1.2 Develop Critical Pathways / Trauma Case Management

1.1.3 Provide Psycho-Social-Economic Support

1.2 Leverage Emerging Technology for System Development

Minimum required technology for clinical services is detailed in the resource document. Technology for communication and education may involve interactive video network and centralized communication center, but must at the minimum provide direct telephone and/or radio access and fax capability.

1.2.1 Clinical Technology

1.2.2 Communication Technology

1.2.3 Education Technology

1.3 Support the Trauma System

Trauma System Hospitals should encourage the education of all trauma care providers. They should also ensure that essential equipment as outlined in the Resource Document is available..

1.3.1 Funding for Clinicians

1.4 Promote Trauma System / EMS Integration

1.4.1 Support Medical Control

Each Trauma Center will be responsible for development, implementation, and ongoing quality improvement of Medical Control in support of Emergency Medical Services Providers. Medical Control activities include the provision of contemporaneous medical direction to out-of-hospital EMS via on-line and off-line services. Protocols for On-line Medical Control have been previously described by Maine EMS on a regional basis. It will be required of Trauma Center's to demonstrate compliance with these protocols. Training for Medical Control Officers is provided by the National Association of Emergency Medical Services Providers. Trauma Centers will be required to provide 24-hour availability of a licensed Maine physician able to immediately participate in On-line Medical Control. In regions and circumstances where technologies and personnel exist to provide centralized Medical Control, such will be adequate to fulfill the requirement of this section, provided that a) it is accomplished with consensus among all Maine Trauma System Hospitals and EMS Providers served, and b) coverage is adequate to provide immediate 24-hour coverage to all requesting agencies by a licensed Maine physician. In the event that Aeromedical or other services are developed to provide transport for trauma patients over extended routes, it will be the responsibility of those services to provide Centralized Medical Control as previously described.

1.4.2 Support Triage Protocols

Each Trauma System Hospital will be responsible for supporting Triage Protocols. Pre-Hospital Triage Protocols have been developed by the Maine EMS Physician Advisory Board.

1.4.3 Support Pre-Hospital System

Each Trauma System Hospital has a responsibility to assist EMS organizations in the development of pre-hospital systems within their geographic area. Specifically, this responsibility consists of three major areas:

- Comprehensive Disaster Management;
- Develop Diagnostic Tools; and
- Crisis Intervention.

1.4.4 Support Transportation Systems

Trauma System Hospitals should support appropriate agencies and organizations in the development of EMS transportation systems that reflect the rural nature, geography, and special needs of the state. This includes the potential for more rapid systems of transportation such as aviation and the special needs of EMS providers.

1.5 Support Trauma System Alignment

Trauma System Hospitals should support system alignment, both vertically and horizontally. Major efforts in attaining system alignment should be the development and deployment of a comprehensive strategic and quality improvement plan, development of systems for provider feedback, and a sharing of resources for education.

1.5.1 Support a Plan with Maximum Involvement

Trauma System Hospitals should support the Trauma System plan for long term system development and quality improvement. This plan should be developed within the context of the trauma team architecture so that it reflects the needs and contributions of all multi-disciplinary team members.

1.5.2 Participate and Support Feedback Programs

Trauma System Hospitals will assist in the development of provider feedback mechanisms. This should include immediate telephone calls and eventual written feedback. Feedback is recognized as the *sine qua non* for system wide quality improvement.

1.5.3 Share Resources/Promote Research & Education

Trauma System Hospitals will share resources both system wide and within their respective geographic areas for trauma research and education. The education part of trauma system development is so crucial that it warrants special emphasis as a major responsibility in its own right, (please see Strategic Goal 2.0 series in this manual).

2 Quality Improvement for System Hospitals - Education

2.1 Create an Environment of Openly Shared Clinical Learning for Education and Training

2.1.1 Meetings to Discuss Issues/Concerns/Needs

A trauma care system plan must include the ability of the system to monitor its own performance and to access its impact on trauma morbidity and mortality. Therefore, regularly scheduled meetings should occur between Maine EMS (lead agency) and representatives assigned by the TAC to discuss issues identified through the QI process: monitoring of state identified audit filters, patient needs and outcomes and system resources etc. In this way trauma care management deficits can be identified and appropriate changes can be made to allow for the continual development and improvement of the system.

2.1.1.1 Care Standards

The Maine Trauma System plan has established standards of care according to ACS and ACEP guidelines for trauma centers and trauma system hospitals including resources and equipment.

2.1.1.2 Regularly Scheduled Education

Regularly scheduled meetings between trauma directors, trauma nurse coordinators, trauma surgeons, ED nurses, and pre-hospital providers should occur monthly to discuss quality patient care.

2.1.1.3 Informal Meetings

Impromptu meetings between trauma director and other trauma personnel should occur on an as needed basis depending on severity of the issue.

2.1.2 Conduct Clinically-Related Training as needed (Just-In-Time)

Collaborative practice rounds should occur weekly and on an as needed basis.

2.1.3 Pre-hospital Providers

Involvement of Pre-hospital Providers in case review presentations should occur as appropriate on a regular basis.

2.1.3.1 Nurses

Involvement of Nurses in case review presentations should occur as appropriate on a regular basis.

2.1.3.2 Physicians

Involvement of Physicians in case review presentations should occur as appropriate on a regular basis.

2.1.3.3 Ancillary Personnel

Involvement of Ancillary Personnel in case review presentations should occur as appropriate on a regular basis.

2.1.4 Conduct Case Reviews

Quality improvement activities should include prospective and retrospective case reviews that may be injury specific triggered by audit filters, randomly selected or based on monthly morbidity mortality conferences. These reviews should involve all appropriate disciplines and are necessary to monitor and assess the facilities' ability to comply with pre-established standards.

2.1.5 Participate in Simulation

2.2 Participate in & Document Formal Trauma Education Courses

The Trauma Centers have unique responsibility in providing formal trauma education and consequently must facilitate the availability of national courses such as ATLS, PHTLS, ABLIS, PALS, and TNCC.

These courses should be held in all parts of the state on a regular basis. Assistance should be provided in scheduling and obtaining faculty for these courses.

2.2.1 Support and Participate in ATLS Courses

ATLS is a course developed and sponsored by the A.C.S. for physicians which covers trauma knowledge and skills. It is considered an optimum standard for trauma care physicians and physician extenders directly involved in the resuscitation of the injured patient. The TAC and the trauma centers should facilitate the availability of this course throughout the state. A physicians education program made and options to facility.

2.2.2 Support and Participate in Pre-Hospital Education

Trauma Centers in general, and physicians in particular, must provide leadership in the development of triage, trauma protocols, and EMS Provider trauma education and training.

PHTLS

PHTLS is a verification course for pre-hospital care providers that teaches concepts of basic and advanced trauma life support.

PALS

Pediatric Advanced Life Support (PALS) is a national level course that should be available for pre-hospital personnel.

PABLS

Pre-Hospital Advanced Burn Life Support (PABLS) is national level course that should be available for pre-hospital personnel.

Air Ambulance

Each system should support established guidelines for land/air transportation subject to legislative regulation, geographic boundaries, and topography etc.

2.3 Support & Document Informal Education and Training

Trauma Centers are expected to provide, support, and chronicle ongoing informal education for all professionals involved in care of injured patients. To this end, the expressed mission of the Trauma Center must include, but is not limited to, the following:

2.3.1 Conduct Informal Talks About Specific Runs / Events

Trauma Center's must be able to demonstrate a willingness and ability to discuss clinically important cases and events with pertinent personnel as the opportunity arises. Compliance with this requirement includes impromptu case discussions in real time, such as a brief review or critique of an Emergency Department case with the transferring or transporting crew. Participants in these reviews should be reminded of the confidential nature of the material discussed as it relates to specific individuals. These sessions may be logged with events described in Section 2.3.1, provided the informal nature of the discussion is noted.

2.3.2 Identify Specific "Point of Contact" Nurses for Trauma Education

Each Trauma Center must identify one or more members of the nursing staff possessing adequate experience and interpersonal skills to ensure optimum inter-provider education as described throughout this section. It will be the responsibility of this nurse to maintain a list of contacts at all referring hospitals and EMS units, and to act as a resource to these providers for the purposes of *ad hoc* education and follow-up.

2.4 Support Public Education

Each Trauma System Hospital has a responsibility for supporting public education within their local area.

3 Quality Improvement for System Hospitals - Data Management, Trauma System Hospitals have a responsibility to manage data

3.1 Participate in a Central Data Maintenance System and Submit Data

Trauma System Hospitals have a responsibility to participate in the regional and state data management system by submitting data. Data submission leads to analysis and input for Education and Quality Improvement.

3.1.1 Institutional Commitment & Support for the Data System

Trauma System Hospitals will support the data management system.

3.1.2 Identify and Train the People to Support the System

Trauma System Hospitals will support the data management system by providing the requisite trained personnel.

3.2 Submit Data

Trauma System Hospitals will submit data to support Education and Quality Improvement.

3.3 Conduct Data Analysis of Individual Cases on a Routine Basis

Trauma System Hospitals will routinely conduct data analysis of individual cases to determine compliance with or deviation from National Standards.

3.4 Participate in Provider & Referral Feedback Mechanisms

Each trauma system hospital will participate in provider and referral feedback mechanisms for Quality Improvement.

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Appendix

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MAINE EMS TRAUMA ADVISORY COMMITTEE

Application for Trauma Centers

Site Survey Process

Pre-survey Questionnaire

Please Complete the Attached Questionnaire and Hospital Resources Table and Return To:

**Maine EMS
16 Edison Drive
Augusta, ME 04330
(207) 287-3953**

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Pre-survey Questionnaire

Please complete this questionnaire and return it to Maine EMS

IV. GENERAL INFORMATION - For Trauma System Hospitals or Trauma Center Applicants

- A. Name of Hospital _____
- B. Number of hospital beds _____.
- C. Number of ICU beds _____.
- D. Number of surgical ICU beds _____.
- E. Number of ED visits last year _____.
- F. Number of ED Trauma related visits last year _____.
- G. Number of trauma admissions in the last 12 months _____.
- H. **For Trauma Centers Only** : Is there a resolution supporting the trauma center by the hospital's governing body? _____ Yes _____ No. If yes, provide documentation.
- I. **For Trauma Centers Only** : Is there a medical staff resolution supporting the trauma center? _____ Yes _____ No. If yes, provide documentation.

This completes the Trauma System Hospital Application.

If you are submitting a Trauma Center Application, you must complete the pages that follow.

V. PREHOSPITAL SYSTEM

A. Describe how the commitment to education, medical control, and interactions with base station medical control. Please describe the hospital's participation in the EMS region. Also describe problems along with proposed solutions relating to pre-hospital care and medical control. Include details about 911, radio communications, management protocols, and interaction with EMS. Include any pre-hospital QA activities.

B. Have you had to divert transfer patients? _____ Yes _____ No.

If so where? _____

VI. HOSPITAL

In order to assist the reviewing team, please describe your hospital, its governance, its role in the community, applicable organizational charts, regional trauma activities, etc. Are all trauma activities within one facility? If not, describe multi-facility relationships.

VII. TRAUMA SERVICES

Please describe the members of the Trauma Service, i.e. all general surgeons, specific trauma surgeons, etc.

Are you using ISS or Revised Trauma Score? _____ ISS _____ RTS

A. Number of trauma admissions for one year beginning 14 months prior to this review _____

1. Total trauma admissions from ED to ICU _____
2. Total trauma admissions from ED to ICU with ISS >15 _____
3. Total trauma admissions from ED to OR _____
4. Total trauma admissions from ED to OR with ISS >15 _____
5. Number of (a) above admitted to Trauma Service _____;
6. Number of (b) above admitted to Trauma Service _____;
7. Number of trauma patients directly admitted to Neurosurgery _____;
8. Number of trauma patients directly admitted to Orthopedics _____;
9. Number of trauma patients admitted to non-surgical services _____.

B. Chief of Trauma Service (See Chart A)

1. Curriculum Vitae (please submit) (Chief)
2. CME in trauma for 3 years (please submit)
3. ATLS status
 - a. Instructor _____ Yes _____ No
 - b. Provider _____ Yes _____ No
 - c. Describe authority to direct trauma service (provide documentation).

4. Provide a copy of job description of Trauma Director; narrative description and organizational chart of the trauma service including its relationships to the Department of Surgery and other major hospital departments and services.

C. Narrative description of the hospital's trauma call roster for surgeons, neurosurgeons, and orthopedic surgeons, including first and second call. Include any policy and procedure for appointment to and removal from trauma call roster. Outline any additional Credentialing process for participation in Trauma Call Roster beyond your routine Credentialing process.

D. List all surgeons taking trauma call (complete Chart A)

1. CME in trauma for 3 years (please submit)
2. ATLS status
3. Frequency of trauma calls per month
4. Board certification

HAVE AVAILABLE AT TIME OF REVIEW:

- E. List of Neurosurgeons (complete Chart B)
 - 1. Curriculum Vitae (please submit) (Chief)
 - 2. List of **trauma** CME for 3 years
 - 3. ATLS status
 - 4. Frequency of trauma call per month
 - 5. Board certification

- F. **List of Orthopedic Surgeons (complete Chart C)**
 - 1. Curriculum Vitae (please submit) (Chief)
 - 2. List of **trauma** CME for 3 years
 - 3. ATLS status
 - 4. Frequency of trauma call per month
 - 5. Board certification

- G. **Trauma Coordinator**
 - 1. Curriculum Vitae (please submit)
 - 2. List of **trauma** CME for 3 years
 - 2. List support personnel (names and titles)
 - 3. Describe the Administrative reporting structure

ARE ANY OF YOUR SURGEONS TAKING TRAUMA CALL AT MORE THAN ONE HOSPITAL? _____ YES _____ NO

If yes, explain:

VIII. HOSPITAL FACILITIES

A. Emergency Department

1. Chief Emergency Department Physician (see Chart D)
 - a. Complete CV
 - b. CME in **Trauma** for 3 years (please submit)
 - c. ATLS status
 - d. Board certification

2. List of Emergency Department Physicians (see Chart D)
 - a. **Trauma** CME for 3 years (please submit)
 - b. ATLS status
 - c. Credentialing process
 - d. Board certification

3. Define role and relationship of emergency medicine in trauma service:

ATTACH A COPY OF EMERGENCY DEPARTMENT TRAUMA FLOW SHEET AND ANY RESUSCITATION THAT ARE APPLICABLE

B. Radiology

1. Is there, in hospital, a 24-hour X-Ray Technician available? ___Yes___No
2. Is there, in hospital, a 24-hour CT Technician available? ___Yes___No
 - a. If not, is there a Quality Assurance Program showing prompt/ appropriate CT management? ___Yes___No
3. Is there resuscitation and monitoring equipment available in the Radiology Suite? ___Yes___No
4. Who accompanies the major trauma patient to the Radiology Suite?

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- b. Is there a massive blood transfusion? _____ Yes _____ No
- c. Do you have any satellite blood banks in hospital?
_____ Yes _____ No
- d. Is there an uncross matched blood protocol? _____ Yes _____ No

2. Clinical Lab:

- a. Is there 24 hour staffing? _____ Yes _____ No
- b. Estimated ED and ICU stat order response time? _____
- c. Do you have any satellite sites for blood gas determination?
_____ Yes _____ No

Comments:

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H. Also, attach a copy of the ICU flow sheet.

XI. SPECIALTY/REHABILITATIVE/SOCIAL SERVICES

A. Rehabilitative Services

1. Who is your Chief of Rehabilitation? _____
(Have CV available during review).

a. Board Certification _____ Yes _____ No
If yes, what specifically?

b. Describe the role and relationship of rehabilitation services to the trauma service

2. Are rehabilitative consultations routinely obtained while trauma patient is in the ICU?
_____ Yes _____ No. If yes, who responds _____

3. What services are provided in the ICU? i.e.,
Physical Therapy _____ Yes _____ No
Occupational Therapy _____ Yes _____ No
Speech Therapy _____ Yes _____ No
Other list please _____

4. Have available (during review) the transfer protocols for acute or long-term disabilities.

B. Pediatric Trauma

1. What is the age limit for pediatric trauma in your hospital? _____

2. What is the number of pediatric trauma admissions during the year? _____

3. Is there a separate pediatric ICU? _____ Yes _____ No

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4. What services admits pediatric trauma ICU patients? _____

5. Who is responsible for pediatric trauma patients in ICU? _____

6. Are there any transfer agreements for pediatric trauma patients?
_____Yes _____No. If so, have available at time of review.

C. Burn Patients

1. Number of burn patients admitted during reporting year _____
2. Describe your transfer policy for burn patients. (Have protocol available at time of review)

D. Spinal Cord Injuries

1. Number of spinal cord patients treated during reporting year _____
2. Number of patients transferred to other facility _____
3. Describe your transfer policy for spinal cord injury patients. (Have available at time of review)

E. Social Services

1. Is there support for trauma service, including family support?
_____Yes _____No
2. Do you have a crisis intervention program? _____Yes _____No
3. Do you have counseling for the family (i.e., chaplain)?
_____Yes _____No
4. Do you have an organ procurement program? _____Yes _____No. If yes, how many referrals were there to Regional Organ Procurement Organization last year?

- F. Are there any transfer policies for transfer INTO the hospital for specific problems?**
_____Yes _____No. If so, list below _____

H. Trauma Death Audits

1. Who reviews Emergency Department trauma deaths? _____

2. Who reviews in-house trauma deaths? _____

a. How many trauma deaths during reporting period? _____
(Include DOA, ED admissions, and in-house).

b. Number of meetings? _____

I. How many audits filters are you using? List at least five _____

J. Who does the nursing audits for trauma? _____

Describe _____

K. How often does the trauma service or problem-solving committee meet? _____

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DO NOT SEND ANY QUALITY ASSURANCE DOCUMENTS OR MINUTES! THESE SHOULD BE AVAILABLE AT TIME OF REVIEW!

WE WILL NEED IN QA REVIEW EVIDENCE OF "CLOSING THE LOOP"

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XIII. DESCRIBE, IN A NARRATIVE, THE COMMITMENT OF YOUR ADMINISTRATION. IS THERE A LINE ITEM BUDGET FOR TRAUMA?

- C. Do you have Intramural Trauma education for the Medical/Nursing Staff? _____ Yes _____ No. If so, have available at time or review.

- D. Do you have educational activities for the public? _____ Yes _____ No. If so, have available at time of review.

- E. Do you provide ATLS courses? _____ Yes _____ No.

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- F. Do you have educational programs for physicians? _____Yes _____No.
- G. Do you have educational programs for prehospital providers? _____Yes _____No.
- H. Is there any hospital funding for extramural physician/nursing trauma education? _____Yes _____No.
- I. Do you have any outreach programs for trauma? _____Yes _____No. If so, have available at time of review.
- J. Do you have any Trauma Prevention Programs? _____Yes _____No. If so, have available at time or review.

XV. RESEARCH ACTIVITIES

LIST LAST THREE YEARS OF TRAUMA RELATED PUBLICATIONS, RESEARCH, ONGOING PROJECTS.

DO NOT SEND REPRINTS!! HAVE THESE AND ANY OTHER MATERIALS AVAILABLE AT TIME OF REVIEW.

THIS REPORT COMPLETED BY: _____

TITLE: _____

_____TRAUMA DIRECTOR:

DJS:cfm

ED:

3/20/95

TRAUMA SURGEONS

CHART A

1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

Name	Residency - Where and When Completed	Board Certification	ATLS Instructor, Provider Status, Date of Expiration	Trauma CME Number of Hours in 3 Years	Frequency of Trauma Call Per Month	Number of Trauma Patients Admitted per Year

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NEUROSURGEONS

CHART B

1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

Name	Residency - Where and When Completed	Board Certification	ATLS Instructor, Provider Status, Date of Expiration	Trauma CME Number of Hours in 3 Years	Frequency of Trauma Call Per Month

ORTHOPEDIC SURGEONS

CHART C

1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

Name	Residency - Where and When Completed	Board Certification	ATLS Instructor, Provider Status, Date of Expiration	Trauma CME Number of Hours in 3 Years	Frequency of Trauma Call Per Month

EMERGENCY PHYSICIANS

1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

Name	Residency - Where and When Completed	Board Certification	ATLS Instructor, Provider Status, Date of Expiration	Trauma CME Number of Hours in 3 Years	Frequency of Trauma Call Per Month

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Maine Trauma System Plan

Surveyor's Guide to the Hospital Resource Table

June 17, 1996

The site survey team will consist of a Trauma surgeon, an emergency physician, a trauma nurse coordinator, an administrator and a representative from Maine EMS. It is expected that the Trauma surgeon will be lead reviewer, and will come from out of state. It is expected that the out of state trauma surgeon will be familiar with Maine's standards for trauma centers.

	Surveyor's Guidelines		Requirements Met? & Comments
A. HOSPITAL ORGANIZATION 1. Trauma Service a. 1. An obligation on the part of the institution and medical staff to care for trauma patients. Specified delineation of privileges for the Trauma Service by the medical staff Credentialing Committee may be desirable. 2. The Trauma Service Director will be a board certified general surgeon with 3. specific commitment to trauma care.	1. This standard may be demonstrated by specific statements in the hospital's mission statement, medical staff bylaws, an organizational structure clearly defining the trauma service with an appropriate responsible administrator. The institutional bylaws or rules should contain language specifying a commitment to care for trauma patients without regard for ability to pay. Evidence of compliance with this can come from an examination of the hospital's transfer logs, discussion with emergency staff etc. Policies regarding diversion should be clearly defined. 2. There should be a specific job description for the Trauma Surgeon. The surgeon should demonstrate continuing trauma education, be ATLS certified, regularly attend the institution's trauma meetings. 3. A contract and or a job description would be expected.	E	.
b. Trauma Coordinator (Under direct supervision of Trauma Service Director)	This role may be filled by an R.N., P.A-c or an M.D./D.O. The standards for the Trauma Surgeon above apply for this role as well.	E	
c. Trauma Contact Person (responsible for communicating with regional trauma coordinators, coordinating trauma transfer feedback and trauma tracking forms and periodic resource assessments. May be Trauma Coordinator)	As above	E	
2. Multi disciplinary Trauma Committee (Trauma Service Director, Trauma Coordinator, with representation from Anesthesiology, Critical Care, Emergency Medicine, General Surgery, Neurologic Surgery, Orthopedic Surgery, Radiology)	An assessment should be made of the meeting frequency; does the committee exist within the medical staff bylaws? To whom does it report? Are minutes kept. What are the issues that the committee has dealt with? Is there appropriate administrative input and support? Does the	E	

	Surveyor's Guidelines		Requirements Met? & Comments
	committee "leverage" the institution's commitment to trauma, for example is there an assessment of resource allocation? Does the committee "operationalize" the goals of the trauma program? Is the role of the committee clearly defined? Is the committee included in issues of QA and QI?		
3. Hospital Departments/Divisions/Services/Sections	For each of these specialties there should be visible evidence that these services are being provided on an ongoing, regular basis at the institution. This could be demonstrated through call schedules, OR/procedure schedules, and discussions with nurses and physicians.		
Anesthesiology	see above	E	
Emergency Medicine	see above	E	
General Surgery	see above	E	
Neurologic Surgery	see above	E	
Orthopedic Surgery	see above	E	
Radiology	see above	E	
4. Specialty Availability	Response times should be demonstrated by individual chart reviews, ED logs, discussion with staff, or summation reports from the trauma registry.		
<i>In-house 24 hours a day</i>			
Anesthesiology (May be satisfied by senior resident, CRNA, or by Anesthesiologist able to arrive in OR within 15 minutes of notification*)	Appropriate response times documented? (see above)	E	
Critical Care Physician (May be satisfied by senior resident or by ICU physician able to arrive within 30 minutes of notification, time of first call and ICU arrival to be routinely recorded*)	Appropriate response times documented? (see above)	E	
Emergency Medicine Physician	Appropriate response times documented? (see above)	E	
General Surgery (May be satisfied by senior surgical resident or by surgeon able to arrive in ED within 30 minutes of notification, time of first call and ED arrival to be routinely recorded*)	Appropriate response times documented? (see above)	E	
Neurologic Surgery (May be satisfied by physician with special competence in neurotrauma, determined by local neurosurgeon who will be able to arrive in ED within 30 minutes of notification, time	Appropriate response times documented? (see above)	E	

	Surveyor's Guidelines		Requirements Met? & Comments
of first call and ED arrival to be routinely recorded*)			
<i>On-call and available within 30 minutes</i>			
Cardiac Surgery	Appropriate response times documented? (see above)	D	
Cardiology	Appropriate response times documented? (see above)	E	
Hand Surgery	Appropriate response times documented? (see above)	E	
Infectious Disease	Appropriate response times documented? (see above)	D	
Internal Medicine	Appropriate response times documented? (see above)	E	
Microvascular Surgery	Appropriate response times documented? (see above)	D	
Nephrology	Appropriate response times documented? (see above)	E	
Obstetrics/Gynecologic Surgery	Appropriate response times documented? (see above)	E	
Ophthalmic Surgery	Appropriate response times documented? (see above)	E	
Oral/Maxillofacial Surgery	Appropriate response times documented? (see above)	E	
Orthopedic Surgery	Appropriate response times documented? (see above)	E	
Pediatrics	Appropriate response times documented? (see above)	E	
Pediatric Surgery (May be satisfied by general surgeon credentialed by hospital to provide surgical trauma care to pediatric patients)	Appropriate response times documented? (see above)	E	
Reconstructive/Plastic Surgery	Appropriate response times documented? (see above)	E	
Pulmonary Medicine	Appropriate response times documented? (see above)	E	
Radiology	Appropriate response times documented? (see above)	E	
Thoracic Surgery (May be satisfied by general surgeon credentialed by hospital to provide thoracic surgical trauma care)	Appropriate response times documented? (see above)	E	
Urologic Surgery	Appropriate response times documented? (see above)	E	

	Surveyor's Guidelines		Requirements Met? & Comments
B. FACILITIES / RESOURCES / CAPABILITIES			
1. Emergency Department (ED)			
a. Personnel			
1. Designated physician director	Obtain evidence of a designated physician director	E	
2. Physician with special competence in care of the critically injured who is a designated member of the trauma team and physically present in the ED 24 hours a day	Evidence of continuing education in trauma care is strongly recommended. Trauma CME may include ATLS or other broad based CME activity..	E	
3. Nurses with special capability in trauma care	Emergency physicians, and emergency nurses should be oriented to the trauma protocol. For nurses, evidence of trauma training is required. Evidence of ongoing training may be fulfilled by TNCC, with a target of 50% of the Emergency nurses being certified. In the absence of the 50% target, there should be a commitment to have at least one TNCC certified nurse on each shift.	E	
b. Equipment for resuscitation shall include but not be limited to:			
1. Airway control and ventilation equipment including laryngoscopes and endotracheal tubes of all sizes, bag-mask resuscitator, pocket masks, oxygen, and mechanical ventilator	Is the specified equipment present?	E	
2. Suction devices	Is the specified equipment present?	E	
3. Electrocardiograph-oscilloscope-defibrillator	Is the specified equipment present?	E	
4. Apparatus to establish central venous pressure monitoring	Is the specified equipment present?	E	
5. All standard intravenous fluids and administration devices, including intravenous catheters	Is the specified equipment present?	E	
6. Sterile surgical sets for standard ED procedures (thoracostomy, venous cut-down, thoracotomy, cricothyroidotomy, etc.)	Is the specified equipment present?	E	

	Surveyor's Guidelines		Requirements Met? & Comments
7. Gastric decompression equipment	Is the specified equipment present?	E	
8. Drugs and supplies necessary for emergency care	Is the specified equipment present?	E	
9. X-ray capability, 24 hour coverage by in-house technician	Is the specified equipment present?	E	
10. Two-way radio linked with vehicles of emergency transport system	Is the specified equipment present?	E	
11. Skeletal traction device for cervical spine injuries	Is the specified equipment present?	E	
12. Thermal control devices for:			
a. Patient (e.g. circulating water or air blanket, radiant heater)	Is the specified equipment present?	E	
b. Blood and fluids (including rapid volume infuser)	Is the specified equipment present?	E	
13. Pulse oximetry	Is the specified equipment present?	E	
14. End-tidal CO ₂ determination	Is the specified equipment present?	E	
15. Pneumatic Anti-Shock Garment (PASG)	Is the specified equipment present?	E	
2. Intensive Care Units (ICUs) for trauma patients	Nurses should be encouraged to have additional education in trauma care. This is not a requirement at this time, but the requirement in B.1.a.3, (Emergency nurses), will be required at the time of recertification.		
a. Designated physician director	Obtain evidence of a designated physician director	E	
b. Critical Care physician on duty in ICU 24 hours a day or immediately available from in- house (May be satisfied by senior resident or by ICU physician able to arrive within 30 minutes of notification)	Response times should be demonstrated by individual chart reviews, ED logs, discussion with staff, or summation reports from the trauma registry. Appropriate response times documented? (see above)	E	
c. Immediate access to clinical laboratory services (including Hb/Hct, ABG, CXR within 30 mins. of request)	Appropriate response times documented? (see above)	E	
d. Equipment:			
1. Airway control and ventilation devices	Is the specified equipment present?	E	

	Surveyor's Guidelines		Requirements Met? & Comments
2. Oxygen source with concentration controls	Is the specified equipment present?	E	
3. Cardiopulmonary resuscitation cart	Is the specified equipment present?	E	
4. Temporary transvenous pacemaker	Is the specified equipment present?	E	
5. Electrocardiograph-oscilloscope-defibrillator	Is the specified equipment present?	E	
6. Cardiac output monitoring	Is the specified equipment present?	E	
7. Electronic pressure monitoring	Is the specified equipment present?	E	
8. Mechanical ventilator-respirators	Is the specified equipment present?	E	
9. Patient weighing devices	Is the specified equipment present?	E	
10. Pulmonary function measuring devices	Is the specified equipment present?	E	
11. Thermal control devices for:			
a. Patient (e.g., circulating water or air blanket, radiant heater)	Is the specified equipment present?	E	
b. Blood and fluids (including rapid volume infuser)	Is the specified equipment present?	E	
12. Inotropic drugs, fluids, supplies	Is the specified equipment present?	E	
13. Intracranial pressure monitoring devices	Is the specified equipment present?	E	
14. Pulse oximetry	Is the specified equipment present?	E	
15. Skeletal traction devices	Is the specified equipment present?	E	
16. Peritoneal lavage equipment	Is the specified equipment present?	E	
3. Postanesthetic Recovery Room (ICU is acceptable)			
a. Registered nurses and other essential personnel 24 hours a day	Nurses should be encouraged to have additional education in trauma care. This is not a requirement at this time, but the requirement in B.1.a.3, (Emergency nurses), will be required at the time of recertification. NOTE If trauma patients are recovered in ICU this education requirement will be waived.	E	
b. Equipment for continuous	Is the specified equipment present?	E	

	Surveyor's Guidelines		Requirements Met? & Comments
monitoring of hemodynamics			
c. Intracranial pressure monitoring devices	Is the specified equipment present?	E	
d. Pulse oximetry	Is the specified equipment present?	E	
e. End-tidal CO ₂ determination	Is the specified equipment present?	E	
f. Thermal control devices for:			
1. Patient (e.g., circulating water or air blanket, radiant heater)	Is the specified equipment present?	E	
2. Blood and fluids (including rapid volume infuser)	Is the specified equipment present?	E	
4. Acute Hemodialysis Capability	Is the specified equipment present?	E	
5. Organized Burn Care	Transfer agreements may facilitate the transfer of patients. An understanding of COBRA requirements should be in place. A transfer protocol should be in place that Manages risk, assures permission to transfer, records the transfer and ensures the use of qualified personnel.		
a. Physician-directed burn center staffed by nursing personnel trained in burn care and equipped properly for care of the extensively burned patient OR b. Transfer agreement with a burn center	This requirement may be fulfilled by a list of receiving facilities have the capability of treating these patients. The reviewer will retrieve a copy of the transfer agreement or list	E	
6. Acute Spinal Cord/Head Injury Management Capability	as above		
a. In circumstances where a designated spinal cord injury rehabilitation center exists in the region, early transfer should be considered; transfer agreements should be in effect	The reviewer will retrieve a copy of the transfer agreement or list	E	
b. In circumstances where a head injury center exists in the region, transfer should be considered in selected patients;	The reviewer will retrieve a copy of the transfer agreement or list	E	

	Surveyor's Guidelines		Requirements Met? & Comments
transfer agreements should be in effect			
7. Radiological Special Capabilities			
a. In-house radiology technician 24 hours a day	May be assessed by examining staffing schedules, staff interviews etc.	E	
b. Angiography of all types	Is there evidence that these procedures are available?	E	
c. Sonography	Is there evidence that these procedures are available?	E	
d. Nuclear scanning	Is there evidence that these procedures are available?	D	
e. In-house computed tomography (CT)	Is there evidence that these procedures are available?	E	
f. In-house CT technician 24 hours a day (May be satisfied by technician able to respond within 30 minutes of notification, time of first call and arrival to be recorded routinely*)	May be assessed by examining staffing schedules, staff interviews etc.	E	
g. Neuroradiology	Is there evidence that these procedures are available?	D	
8. Rehabilitation Medicine			
a. Physician-directed rehabilitation service staffed by nursing personnel trained in rehabilitation care and equipped properly for care of the critically injured patient OR	Obtain evidence of a designated physician director	E	
b. Transfer agreement with a rehabilitation service			
9. Operating Suite Special Requirements			
a. Personnel - Operating room adequately staffed and immediately available 24 hours a day before patient arrives	May be assessed by examining staffing schedules, staff interviews etc.	E	
b. Equipment shall include but not be limited to:			
1. Cardiopulmonary bypass capability	Is the specified equipment present?	D	

	Surveyor's Guidelines		Requirements Met? & Comments
2. Operating microscope	Is the specified equipment present?	D	
3. Thermal control devices for:			
a. Patient (e.g., circulating water or air blanket, radiant heater)	Is the specified equipment present?	E	
b. Blood and fluids (including rapid volume infuser)	Is the specified equipment present?	E	
4. X-ray capability (including C- arm image intensifier)	Is the specified equipment present?	E	
5. Endoscopy (bronchoscopy, esophagoscopy)	Is the specified equipment present?	E	
6. Craniotomy instruments	Is the specified equipment present?	E	
7. Fixation equipment for long bone and pelvic fractures	Is the specified equipment present?	E	
10. Clinical Laboratory Services available 24 hours a day			
a. Standard analyses of blood, urine, and other body fluids	Is the specified equipment present?	E	
b. Blood antigen matching	Is the specified equipment present?	E	
c. Coagulation studies	Is the specified equipment present?	E	
d. Comprehensive blood bank or access to a community central blood bank and adequate hospital storage facilities	Is the specified equipment present?	E	
e. Blood gases and pH determinations	Is the specified equipment present?	E	
f. Microbiology	Is the specified equipment present?	E	
g. Serum alcohol determination	Is the specified equipment present?	E	
h. Drug screening	Is the specified equipment present?	E	
11. Organ Transplantation/Donation	The reviewer should examine the organ procurement policies and procedures; as well as trauma registry reports on organ request and recovery.		
Procedures should be in place through which brain death can be declared, a family approached regarding organ donation, a potential donor supported, and organ		E	

	Surveyor's Guidelines		Requirements Met? & Comments
procurement coordinated with the regional organ procurement center.			
C. QUALITY IMPROVEMENT	<p>The QI plan should be written, and must identify scope, authority, and current audit filters, review processes, corrective approaches and follow-up.</p> <p>Documentation of compliance with the QI process should be examined by selecting one or more audit filters and following the review process through problem resolution.</p> <p>Evaluation of QI activities should include a review of randomly selected major trauma patient records.</p>		
1. Organized Quality Improvement Program	Minutes of trauma QI activity should be available for the reviewer.	E	
2. Special audit for all trauma deaths	Review all mortalities less than age 80, with GCS Motor Score > 3.	E	
3. Morbidity and mortality review	Is there documented evidence that the specified reviews occurred?	E	
4. Multi disciplinary trauma conference (Regular and periodic conferences that include all members of the trauma team. This conference will be for the purpose of quality assurance through critiques of individual cases)	There should be evidence that this conference was held quarterly as a minimum. A more frequent conference is encouraged.	E	
5. Medical nursing audit, utilization review, tissue review	Is there documented evidence that the specified reviews occurred?	E	
6. Hospital-based trauma registry	There should be evidence that the trauma registry data is being used as part of the QI process. Was the registry used to select cases for review?		
a. Trauma registry review (Documentation of severity of injury and outcome by trauma score, age, injury severity score, survival, length of stay, ICU length of stay with monthly review of statistics)		E	
b. Trauma Registrar (responsible for data entry, report generation, and maintenance of hospital-based trauma registry)	This position may be fulfilled by a variety of people, it is not necessary to be one person as long as the trauma registry is complete and up to date.	E	
7. Review of prehospital and regional systems of trauma care	Is the specified review occurring?	E	
8. Published on-call schedule for general surgeons, neurologic	Were these consultants able to respond within 30 minutes or sooner for appropriate patients?	E	

	Surveyor's Guidelines		Requirements Met? & Comments
surgeons, orthopedic surgeons, thoracic surgeons			
9. Reasons for trauma-related hospital destination decision documented and reviewed by quality improvement program	Is the specified review occurring?	E	
D. OUTREACH PROGRAM			
Telephone and on-site consultations with physicians of the community and outlying areas	Is there evidence that this activity is occurring?	E	
E. PUBLIC EDUCATION			
Injury prevention in the home and industry, and on the highways and athletic fields; standard first-aid; problems confronting public, medical profession, and hospitals regarding optimal care for the injured	Schedule of lectures / activities should be available for review.	E	
F. TRAUMA RESEARCH PROGRAM	Provide copies of publications if applicable.	D	
G. TRAINING PROGRAM - Formal program of continuing education in trauma provided by hospital for:	These programs may be multi-disciplinary and may involve any or all of the providers listed below. It is not necessary, to have separate conferences for each group listed below.		
1. Staff physicians		E	
2. Nurses	Provide a list of the topics discussed.	E	
3. Allied health personnel	Provide a list of the topics discussed.	E	
4. Community physicians	Provide a list of the topics discussed.	E	
5. Prehospital personnel	Provide a list of the topics discussed.	E	
H. INTERFACILITY TRANSFERS - Will accept the transfer of all patients who:			
a. Have activated the trauma system by field triage protocols or whom have been directed by Medical Control	Are policies in place to ensure that acceptance is occurring?	E	
b. Have had their transfers requested appropriately through established interhospital transfer procedures	Documentation should be available if appropriate.	E	