Maine EMS Trauma System Plan

October 31, 1996
# Maine EMS Trauma System Plan

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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

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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.

<table>
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<tr>
<th>Divisions</th>
<th>Trauma Center</th>
<th>System Hospital</th>
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<tbody>
<tr>
<td><strong>A. HOSPITAL ORGANIZATION</strong></td>
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<tr>
<td><strong>1. Trauma Service</strong></td>
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<tr>
<td>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.</td>
<td>E</td>
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<tr>
<td>b. Trauma Coordinator (Under direct supervision of Trauma Service Director)</td>
<td>E</td>
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<tr>
<td>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)</td>
<td>E</td>
<td>E</td>
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<tr>
<td><strong>2. Multidisciplinary Trauma Committee</strong> (Trauma Service Director, Trauma Coordinator, with representation from Anesthesiology, Critical Care, Emergency Medicine, General Surgery, Neurologic Surgery, Orthopedic Surgery, Radiology)</td>
<td>E</td>
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<tr>
<td><strong>3. Hospital Departments/Divisions/Services/Sections</strong></td>
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<tr>
<td>Anesthesiology</td>
<td>E</td>
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<tr>
<td>Emergency Medicine</td>
<td>E</td>
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<tr>
<td>General Surgery</td>
<td>E</td>
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<tr>
<td>Neurologic Surgery</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Orthopedic Surgery</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Radiology</td>
<td>E</td>
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<tr>
<td><strong>4. Specialty Availability</strong></td>
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<tr>
<td><em>In-house 24 hours a day</em></td>
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<tr>
<td>Specialty</td>
<td>Trauma Center</td>
<td>System Hospital</td>
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<td>-----------------------------------------------</td>
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</tr>
<tr>
<td>Anesthesiology</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Critical Care Physician</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Emergency Medicine Physician</td>
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<tr>
<td>General Surgery</td>
<td>E</td>
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<tr>
<td>Neurologic Surgery</td>
<td>E</td>
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### On-call and available within 30 minutes

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<tr>
<th>Specialty</th>
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<th>System Hospital</th>
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<tbody>
<tr>
<td>Anesthesiology</td>
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<tr>
<td>Cardiac Surgery</td>
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<td>--</td>
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<td>Cardiology</td>
<td>E</td>
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</tr>
<tr>
<td>Critical Care</td>
<td>See Page 8</td>
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</tr>
<tr>
<td>Emergency Medicine</td>
<td>See Page 8</td>
<td>--</td>
</tr>
<tr>
<td>General Surgery</td>
<td>See Page 8</td>
<td>--</td>
</tr>
<tr>
<td>Hand Surgery</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Infectious Disease</td>
<td>D</td>
<td>--</td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Microvascular Surgery</td>
<td>D</td>
<td>--</td>
</tr>
<tr>
<td>Nephrology</td>
<td>E</td>
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<tr>
<td>Neurologic Surgery</td>
<td>See Page 8</td>
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</tr>
<tr>
<td>Obstetrics/Gynecologic Surgery</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Ophthalmic Surgery</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Oral/Maxillofacial Surgery</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Orthopedic Surgery</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Pediatrics</td>
<td>E</td>
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<tr>
<td>Pediatric Surgery (May be satisfied by general surgeon credentialed by hospital to provide surgical trauma care to pediatric patients)</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Reconstructive/Plastic Surgery</td>
<td>E</td>
<td>--</td>
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<tr>
<td>Pulmonary Medicine</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Radiology</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>Thoracic Surgery (May be satisfied by general surgeon credentialed by hospital to provide surgical trauma care to pediatric patients)</td>
<td>E</td>
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</tr>
<tr>
<td></td>
<td>Trauma Center</td>
<td>System Hospital</td>
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</tr>
<tr>
<td><strong>B. FACILITIES/RESOURCES/CAPABILITIES</strong></td>
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</tr>
<tr>
<td><strong>1. Emergency Department (ED)</strong></td>
<td></td>
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</tr>
<tr>
<td><strong>a. Personnel</strong></td>
<td></td>
<td></td>
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<tr>
<td>1. Designated physician director</td>
<td>E</td>
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</tr>
<tr>
<td>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</td>
<td>E</td>
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<tr>
<td>3. Nurses with special capability in trauma care</td>
<td>E</td>
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<tr>
<td><strong>b. Equipment for resuscitation shall include but not be limited to:</strong></td>
<td></td>
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</tr>
<tr>
<td>1. Airway control and ventilation equipment including laryngoscopes and endotracheal tubes of all sizes, bag-mask resuscitator, pocket masks, oxygen, and mechanical ventilator</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>2. Suction devices</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>3. Electrocardiograph-oscilloscope-defibrillator</td>
<td>E</td>
<td>E</td>
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<tr>
<td>4. Apparatus to establish central venous pressure monitoring</td>
<td>E</td>
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<tr>
<td>5. All standard intravenous fluids and administration devices, including intravenous catheters</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>6. Sterile surgical sets for standard ED procedures (thoracostomy, venous cut-down, thoracotomy, cricothyroidotomy, etc.)</td>
<td>E</td>
<td>E</td>
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<tr>
<td>7. Gastric decompression equipment</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>8. Drugs and supplies necessary for emergency care</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>9. X-ray capability, 24 hour coverage by in-house technician</td>
<td>E</td>
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<tr>
<td>10. Two-way radio linked with vehicles of emergency transport system</td>
<td>E</td>
<td>E</td>
</tr>
<tr>
<td>11. Skeletal traction device for cervical spine injuries</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>12. Thermal control devices for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>a. Patient (e.g., circulating water or air blanket, radiant heater)</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>b. Blood and fluids (including rapid volume infuser)</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>13. Pulse oximetry</td>
<td>E</td>
<td>D</td>
</tr>
<tr>
<td>14. End-tidal CO₂ determination</td>
<td>E</td>
<td>--</td>
</tr>
<tr>
<td>15. Pneumatic Anti-Shock Garment (PASG)</td>
<td>E</td>
<td>D</td>
</tr>
</tbody>
</table>

**2. Intensive Care Units (ICUs) for trauma patients**
| 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 CO₂ determination | E | -- |
| f. Thermal control devices for: | | |
| 1. Patient (e.g., circulating water or air blanket, radiant heater) | E | -- |
2. **Blood and fluids** *(including rapid volume infuser)*

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4. **Acute Hemodialysis Capability**

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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

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OR

b. Transfer agreement with a burn center

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

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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

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7. **Radiological Special Capabilities**

a. In-house radiology technician 24 hours a day

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b. Angiography of all types

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c. Sonography

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d. Nuclear scanning

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e. In-house computed tomography (CT)

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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)*

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g. Neuroradiology

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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

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<th>Trauma Center</th>
<th>System Hospital</th>
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OR

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

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<tr>
<th>Trauma Center</th>
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b. Equipment shall include, but not be limited to:

1. Cardiopulmonary bypass capability

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</table>
### QUALITY IMPROVEMENT

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<thead>
<tr>
<th></th>
<th>Trauma Center</th>
<th>System Hospital</th>
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<tbody>
<tr>
<td>1.</td>
<td>Organized Quality Improvement Program</td>
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</tr>
<tr>
<td>2.</td>
<td>Special audit for all trauma deaths</td>
<td>E</td>
</tr>
<tr>
<td>3.</td>
<td>Morbidity and mortality review</td>
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<tr>
<td>4.</td>
<td>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)</td>
<td>E</td>
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<tr>
<td>5.</td>
<td>Medical nursing audit, utilization review, tissue review</td>
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<tr>
<td>6.</td>
<td>Hospital-based trauma registry</td>
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#### Trauma Center - Based Activities

1. **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)

2. **Hospital - based trauma registry**

3. **Medical nursing audit, utilization review, tissue review**

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.

5. **Morbidity and mortality review**

6. **Organized Quality Improvement Program**

   - 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.

7. **Fixation equipment for long bone and pelvic fractures**

#### Clinical Laboratory Services available 24 hours a day

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<thead>
<tr>
<th></th>
<th>Trauma Center</th>
<th>System Hospital</th>
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<tbody>
<tr>
<td>a.</td>
<td>Standard analyses of blood, urine, and other body fluids</td>
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<tr>
<td>b.</td>
<td>Blood antigen matching</td>
<td>E</td>
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<tr>
<td>c.</td>
<td>Coagulation studies</td>
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<tr>
<td>d.</td>
<td>Comprehensive blood bank or access to a community central blood bank and adequate hospital storage facilities</td>
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<tr>
<td>e.</td>
<td>Blood gases and pH determinations</td>
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<tr>
<td>f.</td>
<td>Microbiology</td>
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<tr>
<td>g.</td>
<td>Serum alcohol determination</td>
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<tr>
<td>h.</td>
<td>Drug screening</td>
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</table>

#### Organ Transplantation/Donation

Processes 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.

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**C. QUALITY IMPROVEMENT**

### Organized Quality Improvement Program

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

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;
• 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.
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 2 1/2 - 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
last revision 22 March 1995

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
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.

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.)

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.

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

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

The transferring care provider should be welcome to contact the attending trauma physician or the trauma nurse coordinator at any time for further discussion.

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

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, \(O_2\) 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: 

Last revision March 27, 1995
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:

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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

1.1 Comprehensive care system using critical pathways
   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 psychosocial - economic support
   1.1.4 Rehabilitation

1.2 Leverage emerging technology for system development

1.3 Fund the system

1.4 Promote trauma system / EMS integration

1.5 Develop team architecture and support structure

1.6 Promote trauma system alignment
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
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 access 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, ABLS, 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.

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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

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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 ½") 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 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;
• 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 by 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 access the facility's 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, ABLS, 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 must be in place.

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.
Appendix
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

Last revision March 27, 1995
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).

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

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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
   3. List support personnel (names and titles)
   4. 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?
C. Operating Room
   1. Number of Operating Rooms __________
   2. Describe your trauma staffing and backup call for day, nights, weekends, and holidays in hospital 24-hour, 7 days, for the following:
      a. Anesthesiologist and CRNA
      b. Circulator
      c. Scrub technician

______________________________

______________________________

______________________________

______________________________

      3. Do you have an OR dedicated to trauma? ______ Yes ______ No

______________________________

______________________________

______________________________

D. Recovery Room - Hours of operation. If not open 24 hours a day, explain:

______________________________

______________________________

______________________________

E. Clinical Lab/Blood Bank
   1. Blood Bank -
      a. Source of blood:
- Is there a massive blood transfusion? ______Yes ______No

- Do you have any satellite blood banks in hospital? ______Yes ______No

- 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:
IX. ICU

A. Number of beds

B. Are any ICU beds dedicated solely to trauma patients? ______Yes ______No

C. What is physician coverage?

D. Is the surgeon credentialed in critical care by Trauma Director on duty in ICU 24 hours a day or immediately available? _____Yes _____No

E. Who is the director? Complete C.V. available at time of review.

F. Who is responsible for the trauma patient?

G. Describe in narrative below the availability of beds, dedication of beds, and governance as it relates to the trauma patient. Attach policy for and frequency of diversion of trauma patients due to unavailability of ICU beds

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H. Also, attach a copy of the ICU flow sheet.
X. ANESTHESIA / CRNA

A. Do you have Anesthesia in-house 24-hours a day? ______Yes ______No. If no, are you applying under your Quality Assurance documentation? ______Yes ______No.

If yes, what are your QA Filters? __________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
_______________________________________________________________________
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
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 ________________________________

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XII. DESCRIBE YOUR FACILITIES TRAUMA QUALITY ASSURANCE PROGRAM INCLUDING:

A. Do you have a trauma register? _____Yes _____No

B. Who maintains the trauma register?

C. Describe the criteria for patient entry into the trauma register?

D. Do you have any regional or national affiliation of your trauma register? 
   _____Yes _____No. Number of patients entered per year in your trauma register?

E. Do you have documentation and statistics of surgeons availability in the OR? 
   _____Yes _____No; ED? _____Yes _____No; ICU? _____Yes _____No

F. How many multi-disciplinary conferences do you have a year?

G. Who attends your multi-disciplinary conferences? (Have minutes and attendance available for past year at time of review).

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?
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”
XIII. DESCRIBE, IN A NARRATIVE, THE COMMITMENT OF YOUR ADMINISTRATION. IS THERE A LINE ITEM BUDGET FOR TRAUMA?
XIV. EDUCATIONAL ACTIVITIES/OUTREACH PROGRAMS

A. Do you have a General Surgery Residency Program? _____Yes _____No. If so, how related to Trauma Service?

B. Do you have other Specialty Residency Programs? _____Yes _____No. If so, list and define any relationship with trauma program.
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.
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: ________________________________

______________________________

______________________________TRAUMA DIRECTOR:

DJS:cfn
ED: 3/20/95

Last revision March 27, 1995
1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

<table>
<thead>
<tr>
<th>Name</th>
<th>Residency - Where and When Completed</th>
<th>Board Certification</th>
<th>ATLS Instructor, Provider Status, Date of Expiration</th>
<th>Trauma CME Number of Hours in 3 Years</th>
<th>Frequency of Trauma Call Per Month</th>
<th>Number of Trauma Patients Admitted per Year</th>
</tr>
</thead>
</table>
1. Complete columns.
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<th>Frequency of Trauma Call Per Month</th>
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</tbody>
</table>
1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

<table>
<thead>
<tr>
<th>Name</th>
<th>Residency - Where and When Completed</th>
<th>Board Certification</th>
<th>ATLS Instructor, Provider Status, Date of Expiration</th>
<th>Trauma CME Number of Hours in 3 Years</th>
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<tbody>
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</tbody>
</table>
1. Complete columns.
2. Have Curricula Vitae available at time of review.
3. Have list of CME credits for past three years available.

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<th>Name</th>
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</tbody>
</table>
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.

<table>
<thead>
<tr>
<th>A. HOSPITAL ORGANIZATION</th>
<th>Surveyor’s Guidelines</th>
<th>Requirements Met? &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Trauma Service</td>
<td>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.</td>
<td>E</td>
</tr>
<tr>
<td></td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td></td>
<td>3. A contract and or a job description would be expected.</td>
<td></td>
</tr>
<tr>
<td>2. Multi disciplinary Trauma Committee</td>
<td>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</td>
<td>E</td>
</tr>
</tbody>
</table>

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

Surveyor’s Guidelines
### 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.

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Surveyor’s Guidelines</th>
<th>Requirements Met? &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiology</td>
<td>see above</td>
<td>E</td>
</tr>
<tr>
<td>Emergency Medicine</td>
<td>see above</td>
<td>E</td>
</tr>
<tr>
<td>General Surgery</td>
<td>see above</td>
<td>E</td>
</tr>
<tr>
<td>Neurologic Surgery</td>
<td>see above</td>
<td>E</td>
</tr>
<tr>
<td>Orthopedic Surgery</td>
<td>see above</td>
<td>E</td>
</tr>
<tr>
<td>Radiology</td>
<td>see above</td>
<td>E</td>
</tr>
</tbody>
</table>

### 4. Specialty Availability

Response times should be demonstrated by individual chart reviews, ED logs, discussion with staff, or summation reports from the trauma registry.

**In-house 24 hours a day**

<table>
<thead>
<tr>
<th>Specialty</th>
<th>Surveyor’s Guidelines</th>
<th>Requirements Met? &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Anesthesiology (May be satisfied by senior resident, CRNA, or by Anesthesiologist able to arrive in OR within 15 minutes of notification*)</td>
<td>Appropriate response times documented? (see above)</td>
<td>E</td>
</tr>
<tr>
<td>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*)</td>
<td>Appropriate response times documented? (see above)</td>
<td>E</td>
</tr>
<tr>
<td>Emergency Medicine Physician</td>
<td>Appropriate response times documented? (see above)</td>
<td>E</td>
</tr>
<tr>
<td>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*)</td>
<td>Appropriate response times documented? (see above)</td>
<td>E</td>
</tr>
<tr>
<td>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</td>
<td>Appropriate response times documented? (see above)</td>
<td>E</td>
</tr>
<tr>
<td>Surveyor’s Guidelines</td>
<td>Requirements Met? &amp; Comments</td>
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<td></td>
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<tr>
<td>of first call and ED arrival to be routinely recorded*)</td>
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<tr>
<td><strong>On-call and available within 30 minutes</strong></td>
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<tr>
<td>Cardiac Surgery</td>
<td>Appropriate response times documented? (see above) D</td>
<td></td>
</tr>
<tr>
<td>Cardiology</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Hand Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Infectious Disease</td>
<td>Appropriate response times documented? (see above) D</td>
<td></td>
</tr>
<tr>
<td>Internal Medicine</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Microvascular Surgery</td>
<td>Appropriate response times documented? (see above) D</td>
<td></td>
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<tr>
<td>Nephrology</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Obstetrics/Gynecologic Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Ophthalmic Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
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<tr>
<td>Oral/Maxillofacial Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Orthopedic Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Pediatrics</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Pediatric Surgery (May be satisfied by general surgeon credentialed by hospital to provide surgical trauma care to pediatric patients)</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Reconstructive/Plastic Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
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<tr>
<td>Pulmonary Medicine</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Radiology</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Thoracic Surgery (May be satisfied by general surgeon credentialed by hospital to provide thoracic surgical trauma care)</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
<tr>
<td>Urologic Surgery</td>
<td>Appropriate response times documented? (see above) E</td>
<td></td>
</tr>
</tbody>
</table>
### B. FACILITIES / RESOURCES / CAPABILITIES

#### 1. Emergency Department (ED)

**a. Personnel**

1. Designated physician director

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
</tr>
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<td>E</td>
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</table>

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

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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</table>

3. Nurses with special capability in trauma care

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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</table>

**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

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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2. Suction devices

*Surveyor’s Guidelines*

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<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
</tr>
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</table>

3. Electrocardiograph-oscilloscope-defibrillator

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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4. Apparatus to establish central venous pressure monitoring

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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</table>

5. All standard intravenous fluids and administration devices, including intravenous catheters

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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6. Sterile surgical sets for standard ED procedures (thoracostomy, venous cut-down, thoracotomy, cricothyroidotomy, etc.)

*Surveyor’s Guidelines*

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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</table>

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
<table>
<thead>
<tr>
<th>2. Oxygen source with concentration controls</th>
<th>Is the specified equipment present?</th>
<th>E</th>
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</thead>
<tbody>
<tr>
<td>3. Cardiopulmonary resuscitation cart</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>4. Temporary transvenous pacemaker</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>5. Electrocardiograph-oscilloscope-defibrillator</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>6. Cardiac output monitoring</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>7. Electronic pressure monitoring</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>8. Mechanical ventilator-respirators</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>9. Patient weighing devices</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>10. Pulmonary function measuring devices</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>11. Thermal control devices for:</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>a. Patient (e.g., circulating water or air blanket, radiant heater)</td>
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<tr>
<td>b. Blood and fluids (including rapid volume infuser)</td>
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<tr>
<td>12. Inotropic drugs, fluids, supplies</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>13. Intracranial pressure monitoring devices</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>14. Pulse oximetry</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>15. Skeletal traction devices</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>16. Peritoneal lavage equipment</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
</tbody>
</table>

### 3. Postanesthetic Recovery Room (ICU is acceptable)

<table>
<thead>
<tr>
<th>a. Registered nurses and other essential personnel 24 hours a day</th>
<th>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.</th>
<th>E</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td><strong>NOTE</strong> If trauma patients are recovered in ICU this education requirement will be waived.</td>
<td></td>
</tr>
<tr>
<td>b. Equipment for continuous</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>Monitoring of hemodynamics</td>
<td>Surveyor’s Guidelines</td>
<td>Requirements Met? &amp; Comments</td>
</tr>
<tr>
<td>-----------------------------</td>
<td>------------------------</td>
<td>-------------------------------</td>
</tr>
<tr>
<td>c. Intracranial pressure monitoring devices</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>d. Pulse oximetry</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>e. End-tidal CO\textsubscript{2} determination</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>f. Thermal control devices for:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>1. Patient (e.g., circulating water or air blanket, radiant heater)</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>2. Blood and fluids (including rapid volume infuser)</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>4. Acute Hemodialysis Capability</td>
<td>Is the specified equipment present?</td>
<td>E</td>
</tr>
<tr>
<td>5. Organized Burn Care</td>
<td>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.</td>
<td></td>
</tr>
<tr>
<td>a. Physician-directed burn center staffed by nursing personnel trained in burn care and equipped properly for care of the extensively burned patient</td>
<td>This requirement may be fulfilled by a list of receiving facilities have the capability of treating these patients.</td>
<td>E</td>
</tr>
<tr>
<td>OR</td>
<td></td>
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</tr>
<tr>
<td>b. Transfer agreement with a burn center</td>
<td>The reviewer will retrieve a copy of the transfer agreement or list</td>
<td></td>
</tr>
<tr>
<td>6. Acute Spinal Cord/Head Injury Management Capability</td>
<td>as above</td>
<td></td>
</tr>
<tr>
<td>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</td>
<td>The reviewer will retrieve a copy of the transfer agreement or list</td>
<td>E</td>
</tr>
<tr>
<td>b. In circumstances where a head injury center exists in the region, transfer should be considered in selected patients;</td>
<td>The reviewer will retrieve a copy of the transfer agreement or list</td>
<td>E</td>
</tr>
</tbody>
</table>
### Surveyor’s Guidelines

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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</table>

### 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 | Obtain evidence of a designated physician director | E |

**OR**

| 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 |
EProcedures should be in place through which brain death can be declared, a family approached regarding organ donation, a potential donor supported, and organ

<table>
<thead>
<tr>
<th>Requirements Met? &amp; Comments</th>
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<tbody>
<tr>
<td>D</td>
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<table>
<thead>
<tr>
<th>11. Organ Transplantation/Donation</th>
</tr>
</thead>
<tbody>
<tr>
<td>The reviewer should examine the organ procurement policies and procedures; as well as trauma registry reports on organ request and recovery.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>2. Operating microscope</th>
</tr>
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<tbody>
<tr>
<td>Is the specified equipment present?</td>
</tr>
<tr>
<td>E</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>3. Thermal control devices for:</th>
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<tbody>
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<td>a. Patient (e.g. circulating water or air blanket, radiant heater)</td>
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<tr>
<td>Is the specified equipment present?</td>
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<tr>
<td>E</td>
</tr>
<tr>
<td>b. Blood and fluids (including rapid volume infuser)</td>
</tr>
<tr>
<td>Is the specified equipment present?</td>
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<tr>
<td>E</td>
</tr>
</tbody>
</table>

| 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 |

<table>
<thead>
<tr>
<th>10. Clinical Laboratory Services available 24 hours a day</th>
</tr>
</thead>
<tbody>
<tr>
<td>a. Standard analyses of blood, urine, and other body fluids</td>
</tr>
<tr>
<td>Is the specified equipment present?</td>
</tr>
<tr>
<td>E</td>
</tr>
<tr>
<td>b. Blood antigen matching</td>
</tr>
<tr>
<td>Is the specified equipment present?</td>
</tr>
<tr>
<td>E</td>
</tr>
</tbody>
</table>

| 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 |

Surveyor’s Guidelines
### C. QUALITY IMPROVEMENT

The QI plan should be written, and must identify scope, authority, and current audit filters, review processes, corrective approaches and follow-up.

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.

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 &gt; 3. | E |
| 3. Morbidity and mortality review | Is there documented evidence that the specified reviews occurred? | E |
| 4. Multi disciplinary trauma conference | 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? | E |
| 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 | 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 |</p>
<table>
<thead>
<tr>
<th>Surveyor’s Guidelines</th>
<th>Requirements Met? &amp; Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>surgeons, orthopedic</td>
<td></td>
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<tr>
<td>surgeons, thoracic</td>
<td></td>
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<tr>
<td>surgeons</td>
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<td>9. Reasons for trauma-related hospital destination decision documented and reviewed by quality improvement program</td>
<td>Is the specified review occurring?</td>
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<td>D. OUTREACH PROGRAM</td>
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<tr>
<td>Telephone and on-site consultations with physicians of the community and outlying areas</td>
<td>Is there evidence that this activity is occurring?</td>
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<tr>
<td>E. PUBLIC EDUCATION</td>
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<tr>
<td>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</td>
<td>Schedule of lectures/activities should be available for review.</td>
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<tr>
<td>F. TRAUMA RESEARCH PROGRAM</td>
<td>Provide copies of publications if applicable.</td>
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<tr>
<td>G. TRAINING PROGRAM - Formal program of continuing education in trauma provided by hospital for:</td>
<td>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.</td>
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<tr>
<td>1. Staff physicians</td>
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<td>2. Nurses</td>
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<td>3. Allied health personnel</td>
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<td>4. Community physicians</td>
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<td>5. Prehospital personnel</td>
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<td>H. INTERFACILITY TRANSFERS - Will accept the transfer of all patients who:</td>
<td></td>
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<tr>
<td>a. Have activated the trauma system by field triage protocols or whom have been directed by Medical Control</td>
<td>Are policies in place to ensure that acceptance is occurring?</td>
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<td>b. Have had their transfers requested appropriately through established interhospital transfer procedures</td>
<td>Documentation should be available if appropriate.</td>
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</tbody>
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