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Standard Guide for Development and Operation of Level 1 Pediatric Trauma Facilities¹

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1. Scope

1.1 This guide establishes minimum guidelines for the development and operation of a pediatric trauma facility in a children's or general hospital. A pediatric trauma facility is an institution whose medical and administrative leadership has expressed the personal, institutional, and financial commitment to optimal care of the injured child 24 h a day, 365 days a year.

1.2 This guide defines the system, organizational structure, clinical personnel, and physical equipment necessary for a pediatric trauma facility, whether freestanding or a joint adult/pediatric facility in either a children's hospital or general hospital committed to the care of injured children.

1.3 The criteria outline in this guide incorporates levels of categorization and their essential or desired characteristics.

2. Referenced Documents

2.1 ASTM Standards:

F 1224 Guide for Providing System Evaluation for Emergency Medical Services²

3. Terminology

3.1 Definitions:

3.1.1 *trauma care system*—a coordinated network of emergency medical systems (EMS) comprised of one or more trauma centers linked by triage protocols, appropriate communications, transportation services, and prehospital care to manage effectively the injured child from initial injury to complete rehabilitation. The trauma care system is a subsystem within the EMS system.

3.1.2 *trauma center*—a hospital that has made the institutional commitment to fulfill all criteria outlined in Sections 1 through 4 and where available be designated by the appropriate authority.

3.2 Definitions of Terms Specific to This Standard:

3.2.1 *pediatric patient*—a patient whose morphologic growth potential has not been completed. In general, a patient less than 15 years old or consistent with local practice.

4. Significance and Use

4.1 The purpose of this guide is to provide guidelines for categorizing pediatric trauma centers to ensure consistency of pediatric trauma care throughout the nation. The guidelines will form the quantitative basis for audit and ongoing quality assurance.

4.2 This guide can be used in conjunction with objective quality assurance outcome measures as outlined in Guide F 1224.

4.3 This guide can be used by local, regional, and national authorities to establish pediatric trauma centers.

5. Implementation of Pediatric Trauma Facilities

5.1 The implementation of a pediatric trauma facility designation will be conducted consistent with the regulation of local, state, and federal government authorities having jurisdiction for this process.

5.2 The most significant ingredient necessary for optimal care of the pediatric trauma patient is commitment, both personal and institutional. For the institutions, optimal care means providing capable personnel who are immediately available, sophisticated equipment, services that are frequently expensive to purchase and maintain, and priority of access to laboratory, radiology, operating suites, and intensive care facilities and services. For the medical and nursing staff, optimal care means a commitment to the concept of adequate staffing, prompt availability, continuing education, and quality assurance.

5.3 It is recognized that a Level I pediatric trauma center should be located in a facility providing comprehensive care for children. The institutions must demonstrate a continuing commitment to a high level of pediatric trauma care. Methods of demonstrating the commitment to the trauma system shall include, but not be limited to, a broad resolution that the hospital governing body agrees to do the following:

5.3.1 Participate in the operations and integration of a regional or statewide system, to ensure pediatric patient care data for system management, quality assessment, and operations research,

5.3.2 Establish policy and procedures for the maintenance of services essential for a trauma center/system,

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² *Annual Book of ASTM Standards*, Vol 13.02.



5.3.3 Ensure that all pediatric trauma patients will receive medical care to the level of the institution's accreditation, and

5.3.4 Establish a priority admission for the pediatric trauma patient to the full services of the institution, including adequate resuscitation facilities and personnel, operating room availability, and intensive care unit availability. The Level I pediatric trauma center must assume the responsibility for ensuring prompt access for all patients requiring trauma care.

5.3.5 Written transfer agreements to receive and transfer the pediatric trauma patient must be in place.

5.3.6 The pediatric trauma center must have the capability to receive the pediatric trauma patient by ground or by air.

6. Criteria for Level I Pediatric Trauma Facilities

6.1 *Participation Requirements:*

6.1.1 Designation as a Level I trauma center confers upon a facility the recognition that it has the commitment, personnel, and resources to provide optimum medical and psychological care for the critically injured child.

6.1.2 The center shall have appropriate support services for the child and the family and commitment to the ongoing care and total rehabilitation of the patient. This shall include the following:

6.1.2.1 Evidence of appropriate social service intervention and follow-up,

6.1.2.2 Identification of members of the rehabilitation team,

6.1.2.3 Discharge summary of the trauma care to the patient's private physician, where appropriate, and

6.1.2.4 Documentation in the patient's medical record of the post-discharge plan.

6.1.3 A Level I pediatric trauma center shall demonstrate its capability to manage injured and their sequelae to major injuries or critical conditions such as:

6.1.3.1 Signs of shock or hypotension associated with one or more system injuries,

6.1.3.2 Fractures of the axial skeleton,

6.1.3.3 Two or more proximal long-bone fractures,

6.1.3.4 Amputation or traumatic avulsion of one or more extremities proximal to digits,

6.1.3.5 Suspected or actual spinal cord injuries,

6.1.3.6 Head injuries,

6.1.3.7 One or more system injuries requiring pediatric intensive care, intracranial pressure monitoring, or mechanical ventilation support, and

6.1.3.8 Thermal or chemical injury.

6.2 *Service Requirements:*

6.2.1 Criteria guidelines embrace administrative and physical attributes of individual trauma centers. By this means, autonomous functioning of the trauma service may be ensured, and its staffing and direction sharply defined. The definition of bed capacity, intensive care unit, operating room capability, and proximity to an availability of supporting services (radiology, laboratory, and so forth) are important features of the concept. The intent is to ensure the optimal coordination of services for the trauma patient.

6.2.2 The hospital shall have an organized, defined trauma service within the institutional structure that shall consist of the following:

6.2.2.1 A pediatric surgeon as chief of the pediatric trauma service who shall have special interest and experience in major pediatric trauma care and the leadership skills to head a multidisciplinary team approach to the management of the patient. This surgeon shall have a significant time commitment to major trauma care.

6.2.2.2 The pediatric trauma service shall have designated pediatric specialists available 24 h per day for care of the major trauma patients.

6.2.2.3 Children with significant injuries shall undergo evaluation by the trauma service and disposition to the appropriate hospital service.

6.2.2.4 All pediatric trauma patients shall be treated by personnel who are organized as a team and available in-house from the major trauma service and the pediatric service 24 h per day with attending coverage as specified.

6.2.2.5 A designated pediatric surgeon is responsible for multidisciplinary and interdepartmental coordination of effort to trauma care.

6.3 *Trauma Service Director:*

6.3.1 Fundamental to the establishment and organization of a hospital's pediatric trauma service is the recognition that the individual identified and accountable for the operation of this service must be qualified to serve in this capacity. The following indicators shall be present:

6.3.1.1 Evidence of qualifications, including pediatric educational preparation in pediatric surgery and a certificate of special qualifications in pediatric surgery,

6.3.1.2 Selection process as defined by the hospital's medical staff bylaws,

6.3.1.3 Participation in local/state/national trauma-related activities,

6.3.1.4 Educational involvement such as the Advance Trauma Life Support (ATLS) course, teaching in the undergraduate, graduate, and postgraduate level training programs within the department of surgery. There shall be evidence of interface and collaboration between nursing management responsible for the trauma nursing service and the physician management responsible for the trauma service,

6.3.1.5 Participation in research and publication efforts of pediatric trauma,

6.3.1.6 Evidence of active participation by the trauma program director in the resuscitation or surgery, or both, of multisystem trauma patients,

6.3.1.7 A job description and organizational chart depicting the relationship between the trauma program director and other hospital clinical services, and

6.3.1.8 Evidence that a multidisciplinary method of providing, monitoring, and evaluating trauma patients throughout their hospital stay is in effect through the hospital organizational plan.

6.4 *Nursing Requirements:*

6.4.1 The hospital organization must define the roles of the nursing team members and their areas of responsibility, accountability, and authority.

6.4.2 It is suggested that the trauma plan for the nursing department include the ability to immediately mobilize qualified nursing resources.





6.4.3 Essential to the overall coordination and integration of the trauma center or system in the hospital is the designation of an individual as the pediatric trauma nurse coordinator. The trauma nurse coordinator should be responsible for monitoring and promoting all trauma-related activities associated with patient care, and for providing documented evidence thereof.

6.4.3.1 Participation in trauma educational activities separate from the institution's in-house trauma education program as either program coordinator, consultant, or faculty member shall be required. There must be evidence of specific pediatric nursing practice application. There must be evidence of documentation of this participation.

6.4.4 The following indicators shall be present:

6.4.4.1 Evidence of qualification to include educational preparation, certification, and experience in pediatrics,

6.4.4.2 Participation in local, state, and national pediatric trauma-related nursing activities,

6.4.4.3 Evidence of participation in trauma research through promotion or coordination,

6.4.4.4 A job description and organizational chart depicting the relationship between the trauma nurse coordinator and other services, and

6.4.4.5 Evidence of participation in the establishment of systems to influence the nursing care of pediatric trauma patients.

6.5 *Department Requirements*—There shall be surgery departments, divisions, services, or sections with designated chiefs and staffed by qualified specialists with expertise in pediatrics in the following areas:

- 6.5.1 Pediatric general surgery,
- 6.5.2 Orthopedic surgery,
- 6.5.3 Cardiac surgery,
- 6.5.4 Vascular surgery,
- 6.5.5 Neurosurgery,
- 6.5.6 Urology,
- 6.5.7 Ear, nose, and throat,
- 6.5.8 Plastic and maxillofacial surgery,
- 6.5.9 Oral surgery,
- 6.5.10 Ophthalmic surgery,
- 6.5.11 Transplant or transfer agreement,
- 6.5.12 Reimplantation, or appropriate transfer agreement, and
- 6.5.13 Obstetrics and gynecologic surgery consultation.

6.6 *Physician Requirements:*

6.6.1 *Specialists*—Specialists shall be available in-hospital 24 h per day, as follows:

- 6.6.1.1 Pediatric surgical attendant or resident,
- 6.6.1.2 Pediatric attendant or resident,
- 6.6.1.3 Anesthesiologist or resident, and
- 6.6.1.4 Neurosurgical attendant or resident, or surgical designee of chief of neurosurgery.

6.6.2 *Attending Staff*—Attending (on-site) staff with expertise in pediatrics shall be on-call and promptly available in the following areas:

- 6.6.2.1 Orthopedic surgery,
- 6.6.2.2 Ophthalmic surgery,
- 6.6.2.3 Ear, nose and throat,
- 6.6.2.4 Plastic surgery,

- 6.6.2.5 Oral surgery,
- 6.6.2.6 Urologic surgery,
- 6.6.2.7 Hand surgery,
- 6.6.2.8 Burn,
- 6.6.2.9 Radiology,
- 6.6.2.10 Vascular radiology,
- 6.6.2.11 Neuroradiology,
- 6.6.2.12 Mental health services,
- 6.6.2.13 Pediatric medicine,
- 6.6.2.14 Pediatric critical care,
- 6.6.2.15 Neurosurgery, and
- 6.6.2.16 Anesthesia.

6.6.3 *Pediatric Consultation*—Specialists shall be on-staff and available on-site to respond for pediatric consultation in the following areas:

- 6.6.3.1 Cardiology,
- 6.6.3.2 Gastroenterology,
- 6.6.3.3 Hematology,
- 6.6.3.4 Infectious disease,
- 6.6.3.5 Psychiatry,
- 6.6.3.6 Neurology,
- 6.6.3.7 Pulmonary disease,
- 6.6.3.8 Clinical pathology,
- 6.6.3.9 Rehabilitation medicine, and
- 6.6.3.10 Nephrology.

6.6.4 *Subspecialists*—All subspecialists in a Level I specialty pediatric trauma center shall be board certified subspecialists where appropriate.

7. Hospital Resource Requirements

7.1 *General*—A Level I pediatric trauma facility shall have all of the hospital resources described in this section.

7.2 *Emergency Department:*

7.2.1 The hospital shall have an easily accessible and identifiable designated resuscitation area used for neonate, pediatric/adolescent major trauma patients.

7.2.2 The physical environment shall have areas for at least two simultaneous resuscitations.

7.2.3 The hospital should demonstrate a commitment to pediatric emergency care, and demonstrate compliance with the following requirements:

7.2.3.1 The designated trauma resuscitation area must be of adequate size to accommodate the full trauma resuscitation team.

7.2.3.2 Adequate facilities and personnel must be available within the emergency department to care simultaneously for more than one multisystem trauma patient. Back up areas to accomplish this need not be separately designated but should be immediately available.

7.2.3.3 Under normal conditions, the emergency department shall be open at all times.

7.2.3.4 All closures of the emergency department, for whatever reasons, shall be documented with notification of appropriate authorities and institutions.

7.2.3.5 The institution shall develop formal written protocols with neighboring trauma centers to accept trauma patients when bypass is mandatory.

