

Missouri

**Emergency Medical
Care System**



Time Critical

Diagnosis Resources

January 2013

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Section 1:

Draft Trauma Regulations

19 CSR 30-40.430 Standards for Adult Trauma Center Designation April 21, 2011 DRAFT

PURPOSE: This rule establishes standards for level I, II and III trauma center designation.

EDITOR'S NOTE: I-R, II-R or III-R after a standard indicates a requirement for level I, II or III trauma center respectively.

I-IH, II-IH or III-IH after a standard indicates an in-house requirement for level I, II or III trauma center respectively.

I-IA, II-IA or III-IA indicates an immediately available requirement for level I, II or III trauma center respectively.

I-PA, II-PA or III-PA indicates a promptly available requirement for level I, II or III trauma center respectively.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) General Standards for Trauma Center Designation.

(A) The hospital board of directors, administration, medical staff and nursing staff shall demonstrate a commitment to quality trauma care. Methods of demonstrating the commitment shall include, but not be limited to, a board resolution that the hospital governing body agrees to establish policy and procedures for the maintenance of services essential for a trauma center; assure that all trauma patients will receive medical care at the level of the hospital's designation; commit the institution's financial, human and physical resources as needed for the trauma program; and establish a priority admission for the trauma patient to the full services of the institution. (I-R, II-R, III-R)

(B) Trauma centers shall agree to accept all trauma victims appropriate for the level of care provided at the hospital, regardless of race, sex, creed or ability to pay. (I-R, II-R, III-R)

(C) The hospital shall demonstrate evidence of a trauma program that provides the trauma team with appropriate experience to maintain skill and proficiency in the care of trauma patients. Such evidence shall include meeting of continuing education unit requirements by all professional staff, documented regular attendance by all core trauma surgeons and liaison representation from neurosurgeons, orthopedic surgeons, emergency medicine physicians, and anesthesiologists at trauma program performance improvement and patient safety program meetings, documentation of continued experience as defined by the trauma medical director in management of sufficient numbers of severely injured patients to maintain skill levels, and outcome data on quality of patient care as defined by regional emergency medical service committees. Regular attendance shall be defined by each trauma service, but shall be not less than fifty percent (50%) of all

meetings. The trauma medical director must ensure and document dissemination of information and findings from the peer review meetings to the non-core surgeons on the trauma call roster.

(D) There shall be a lighted designated **helicopter landing area** at the trauma center to accommodate incoming medical helicopters. (I-R, II-R, III-R)

1. The landing area shall serve solely as the receiving and take-off area for medical helicopters and shall be cordoned off at all times from the general public to assure its continual availability and safe operation. (I-R, II-R, III-R)
2. The landing area shall be on the hospital premises no more than three (3) minutes from the emergency room. (I-R, II-R, III-R)

(E) The hospital shall appoint a board-certified surgeon to serve as the **trauma medical director**. (I-R, II-R, III-R)

1. There shall be a job description and organization chart depicting the relationship between the trauma medical director and other services. (I-R, II-R, III-R)
2. The trauma medical director shall be a member of the surgical trauma call roster. (I-R, II-R, III-R)
3. The trauma medical director shall be responsible for the oversight of the education and training of the medical and nursing staff in trauma care. (I-R, II-R, III-R)
4. The trauma medical director shall document a minimum average of sixteen (16) hours of continuing medical education (CME) in trauma care every year. If also designated as a pediatric trauma center, the trauma medical director shall follow the pediatric trauma center education requirements of a minimum average of sixteen (16) hours of CME in trauma care every year, 4 of which shall be in pediatric trauma care. (I-R, II-R, III-R)
5. The trauma medical director shall participate in the trauma center's research and publication projects. (I-R)

(F) There shall be a **trauma nurse coordinator/trauma program manager**. (I-R, II-R, III-R)

1. There shall be a job description and organization chart depicting the relationship between the trauma nurse coordinator/trauma program manager and other services. (I-R, II-R, III-R)
2. The trauma nurse coordinator/trauma program manager shall document a minimum average of sixteen (16) hours of continuing nursing education in trauma care every year. If also designated as a pediatric trauma center, the trauma medical director shall follow the pediatric trauma center education requirements of a minimum average of sixteen (16) hours of CME in trauma care every year, 4 of which shall be in pediatric trauma care. (I-R, II-R, III-R)

(G) By the time of the initial review, all **general surgeon members of the surgical trauma call roster** shall have successfully completed or be registered for a provider Advanced Trauma Life Support (ATLS) course. Current certification must then be maintained by each general surgeon on the trauma call roster. (I-R, II-R, III-R)

(H) **All members of the surgical trauma call roster and emergency medicine physicians** including liaisons for anesthesiology, neurosurgery, and orthopedic surgery shall document a minimum average of eight (8) hours of CME in trauma care every year. In hospitals intending to designate as an adult trauma center and intending to provide care to and/or admit injured children fourteen

(14) years of age and younger, four (4) of the eight (8) hours of education per year must be applicable to pediatric trauma. This requirement may be waived in centers where policy exists diverting injured children to a pediatric trauma center and where a pediatric trauma center is adjacent and a performance improvement filter reviewing any children seen is maintained. (I-R, II-R, III-R)

(I) The hospital shall demonstrate that there is a **plan for adequate post-discharge follow-up** on trauma patients, including rehabilitation and repatriation if indicated. (I-R, II-R, III-R)

(J) A **Missouri trauma registry** shall be completed on each patient who sustains a traumatic injury and meets the following criteria: Includes at least one (1) code within the range of the following injury diagnostic codes as defined in the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9)-(CM) 800-959.9 which is incorporated by reference in this rule as published by the Centers for Disease Control and Prevention in 2006 and is available at National Center for Health Statistics, 1600 Clifton Road, Atlanta, GA 30333. This rule does not incorporate any subsequent amendments or additions. Excludes all diagnostic codes within the following code ranges: 905–909.9 (late effects of injury), 910–924.9 (superficial injuries, including blisters, contusions, abrasions, and insect bites), 930–939.9 (foreign bodies), and must include one of the following criteria: hospital admission, patient transfer **[into or out of facility- from peds regs., QA group would like to include]** out of facility, or death resulting from the traumatic injury (independent of hospital admission or hospital transfer status). The registry shall be submitted electronically in a format defined by the Department of Health and Senior Services. Electronic data shall be submitted quarterly, ninety (90) days after the quarter ends **[Trauma QA group recommends that this be quarterly]**. The trauma registry must be current and complete. A patient log with admission date, patient name, and injuries must be available for use during the site review process. Information provided by hospitals on the trauma registry shall be subject to the same confidentiality requirements and procedures contained in section 192.067, RSMo. The trauma care data elements shall be those identified and defined by the National Trauma Data Standard which is incorporated by reference in this rule as published by the American College of Surgeons in 2008 and is available at the American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, III-R) **will need to add state specific data elements once QA group finalizes them.**

(K) The hospital shall have a **trauma team activation protocol** that establishes the criteria used to rank trauma patients according to the severity and type of injury and identifies the persons authorized to notify trauma team members when a severely injured patient is en route or has arrived at the trauma center. (I-R, II-R, III-R)

1. The trauma team activation protocol shall provide for immediate notification and response requirements for trauma team members when a severely injured patient is en route to the trauma center. (I-R, II-R, III-R)

(L) The hospital shall have a plan to notify an **organ or tissue procurement** organization and cooperate in the procurement of anatomical gifts in accordance with the provisions in section 194.233, RSMo. (I-R, II-R, III-R)

(M) There shall be no level III trauma centers designated within fifteen (15) miles of any Missouri level I or II trauma center.

(2) Hospital Organization Standards for Trauma Center Designation.

(A) There shall be a delineation of privileges for the trauma service staff made by the medical staff credentialing committee. (I-R, II-R, III-R)

(B) All members of the surgical trauma call roster shall comply with the availability and response requirements in subsection (2)(D) of this rule. If not on the hospital premises, trauma team members who are immediately available shall carry electronic communication devices at all times to permit contact by the hospital and shall respond immediately to a contact by the hospital. (IR, II-R, III-R)

(C) Surgeons who are board-certified or board-admissible or complete an alternate pathway as documented and defined by the trauma medical director using the criteria established by the American College of Surgeons (ACS) in the current Resource for Optimal Care Document in the following specialties and who are credentialed by the hospital for trauma care shall be on the trauma center staff and/or be available to the patient as indicated. The Resource for Optimal Care Document is incorporated by reference in this rule as published by the American College of Surgeons in 2006 and is available at the American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions.

1. General surgery—I-R/IH, II-I/A, IIIP/A.

A. The general surgery staffing requirement may be fulfilled by a senior surgery resident (third clinical post-graduate year or higher) credentialed in general surgery, including trauma care, and Advanced Trauma Life Support (ATLS) certification and capable of assessing emergency situations in general surgery.

B. The trauma surgeon shall be immediately available and in attendance with the patient when a trauma surgery resident is fulfilling availability requirements.

C. In a level I or II center, call rosters providing back-up coverage will be maintained for general trauma surgeons. In a level III center, call rosters providing for back-up coverage for general trauma surgeons will be maintained or a written transfer agreement to a level I or II trauma center provided.

D. Surgeons who are board-certified or board-admissible and who are credentialed by the hospital for trauma care shall be on the trauma center staff.

2. Neurologic surgery—I-IH, II-IA.

A. The neurologic surgery staffing requirement may be fulfilled by a surgeon, including the chief resident, the PGY6 resident, or the PGY5 resident in neurosurgery, -who has been approved by the chief of neurosurgery for care of patients with neurologic trauma.

B. The surgeon shall be capable of initiating measures toward stabilizing the patient and performing diagnostic procedures.

C. If attending presence required, the attending shall be promptly available.

D. A level I center shall have a back-up call schedule for neurosurgery coverage or a transfer agreement for when neurosurgery primary and back-up coverage are not available when number one (1) below applies and number two (2) below is also not available.:-

1. When the volume of neurotrauma is low, a backup call schedule is not essential if in a single trauma center or two trauma centers within the same community covered by a single neurosurgeon, fewer than twenty-five (25) neurosurgical trauma procedures (excluding intracranial pressure monitors) are done within 24 hours of admission per year, between the two centers)

2. In trauma centers with accredited neurosurgical residency training programs, a senior postgraduate year five (5) or greater neurosurgery resident may serve as the backup.

E. A level II center shall have a back-up call schedule for neurosurgery coverage or a transfer agreement for when neurosurgery primary and back-up coverage not available.

1. When the volume of neurotrauma is low, a backup call schedule is not essential if in a single trauma center or two trauma centers within the same community covered by a single neurosurgeon, fewer than twenty-five (25) neurosurgical trauma procedures (excluding intracranial pressure monitors) are done within 24 hours of admission per year, between the two centers)

2. In trauma centers with accredited neurosurgical residency training programs, a senior postgraduate year five (5) or greater neurosurgery resident may serve as the backup.

3. For Level II centers in communities where neurosurgeon availability is limited, it may occasionally be necessary to redirect neurotrauma cases to a similar or higher level verified trauma center with available neurosurgical coverage within that community, if this redirection can be accomplished promptly. This alternative requires a predefined neurotrauma diversion plan known to emergency medical services and all members of the trauma team. This system must be thoroughly developed and function so that the care of injured patients is not compromised by the lack of availability of a neurosurgeon at the receiving center.

3. Cardiac Surgery-I-R/PA

4. Thoracic surgery—I-R/PA, II-R/PA.

5. Obstetric-gynecologic surgery—IR/ PA, II-R/PA.

6. Ophthalmic surgery—I-R/PA, IIR/ PA.

7. Orthopedic surgery—I-R/PA, IIR/ PA, III/PA.

A. A level I center shall have dedicated coverage to the institution.

B. A level II or III center shall have dedicated coverage to the institution or an effective back-up call or a transfer agreement.

8. Maxillofacial trauma surgery—IR/ PA, II-R/PA.

9. Otorhinolaryngologic surgery—I-R/PA, II-R/PA.

10. Pediatric surgery/trauma surgeon credentialed and privileged in pediatric trauma care—I-R/IA, II-R/PA; this requirement will be waived in centers that provide evaluation and care to adults only.

11. Plastic surgery—I-R/PA, II-R/PA.

12. Urologic surgery—I-R/PA, II-R/PA.

13. Emergency medicine—I-R/IH, IIR/ IH, III-R/IH.

14. Cardiology—I-R/PA, II-R/PA.

15. Chest pulmonary medicine—IR/ PA, II-R/PA.

16. Gastroenterology—I-R/PA, II-R/PA.

17. Hematology—I-R/PA, II-R/PA.

18. Infectious diseases—I-R/PA, IIR/ PA.

19. Internal medicine—I-R/PA, II-R/PA, III-R/PA.
20. Nephrology—I-R/PA, II-R/PA.
21. Dialysis- I-R
22. Pathology—I-R/PA, II-R/PA.
23. Pediatrics—I-R/PA, II-R/PA.
24. Psychiatry—I-R/PA, II-R/PA.
25. Radiology—I-R/PA, II-R/PA.
26. Hand Surgery-Recommended at a level I center; if not available, the center shall have a transfer agreement
27. Microvascular Surgery- Recommended at a level I center; if not available, the center shall have a transfer agreement
28. Anesthesiology—I-R/IH, II-R/IA, III-R/PA.
 - A. In a level I or II trauma center, anesthesiology staffing requirements may be fulfilled by anesthesiology residents or certified registered nurse anesthetists (CRNA) capable of assessing emergent situations in trauma patients and of providing any indicated treatment including induction of anesthesia or may be fulfilled by anesthesiologist assistants with anesthesiologist supervision in accordance with sections 334.400 to 334.430, RSMo.
 - B. In a level III trauma center, anesthesiology requirements may be fulfilled by a CRNA with physician supervision, or an anesthesiologist assistant with anesthesiology supervision.

(3) Standards for Special Facilities/Resources/Capabilities for Trauma Center Designation.

- (A) The hospital shall meet emergency department standards for trauma center designation.
1. The emergency department staffing shall ensure immediate and appropriate care of the trauma patient. (I-R, II-R, III-R)
 - A. The physician director of the emergency department shall be board-certified or board-admissible in emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada. (I-R, II-R)
 - B. There shall be a physician trained in the care of the critically injured as evidenced by credentialing in ATLS and current in trauma CME in the emergency department twenty-four (24) hours a day. All emergency department physicians shall be certified in ATLS at least once. Physicians who are certified in boards other than emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada who treat trauma patients in the emergency department are required to have current ATLS status. ATLS is incorporated by reference in this rule as published by the American College of Surgeons in 2003 and is available at American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, III-R).
 - C. There shall be written protocols defining the relationship of the emergency department physicians to other physician members of the trauma team. (I-R, II-R, III-R)
 - D. All registered nurses assigned to the emergency department shall be credentialed in trauma nursing by the hospital within one (1) year of assignment. (I-R, II-R, III-R)
 - (I) Registered nurses credentialed in trauma nursing shall document a minimum of eight (8) hours of trauma-related continuing nursing education per year. (I-R, II-R, III-R)

(II) Registered nurses credentialed in trauma care shall obtain maintain current provider status in the Trauma Nurse Core Curriculum or Advanced Trauma Care for Nurses and either Pediatric Advanced Life Support (PALS), Advanced Pediatric Life Support (APLS), or Emergency Nursing Pediatric Course (ENPC) within one (1) year of employment in the emergency department and maintain thereafter. The requirement for Pediatric Advanced Life Support, Advanced Pediatric Life Support, or Emergency Nursing Pediatric Course may be waived in centers where policy exists diverting injured children to a pediatric trauma center and where a pediatric trauma center is adjacent and a performance improvement filter reviewing any children seen is maintained. The Trauma Nurse Core Curriculum is incorporated by reference in this rule as published in 2007 by the Emergency Nurses Association and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. Advanced Trauma Care for Nurses is incorporated by reference in this rule as published in 2003 by the Society of Trauma Nurses and is available at the Society of Trauma Nurses, 1926 Waukegan Road, Suite 100, Glenview, IL 60025. This rule does not incorporate any subsequent amendments or additions. Pediatric Advanced Life Support is incorporated by reference in this rule as published in 2005 by the American Heart Association and is available at the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231. This rule does not incorporate any subsequent amendments or additions. The Emergency Nursing Pediatric Course is incorporated by reference in this rule as published by the Emergency Nurses Association in 2004 and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, III-R)

2. **Equipment** for resuscitation and life support with age appropriate sizes for the critically or seriously injured shall include the following:

- A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen, and mechanical ventilator—I-R, IIR, III-R;
- B. Suction devices—I-R, II-R, III-R;
- C. Electrocardiograph, cardiac monitor, and defibrillator—I-R, II-R, III-R;
- D. Central line insertion equipment— I-R, II-R, III-R;
- E. All standard intravenous fluids and administration devices including intravenous and intraosseus catheters—I-R, II-R, III-R;
- F. Sterile surgical sets for procedures standard for the emergency department—I-R,II-R, III-R;
- G. Gastric lavage equipment—I-R, IIR, III-R;
- H. Drugs and supplies necessary for emergency care—I-R, II-R, III-R;
- I. Drugs and supplies necessary for emergency care, including length-weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight (I-R, II-R, III-R)
- J. Blood pressure cuffs, chest tubes, nasogastric tubes and urinary drainage apparatus (I-R, II-R, II-R)
- K. Two-way radio linked with emergency medical service (EMS) vehicles—I-R, II-R, III-R;
- L. End-tidal carbon dioxide monitor— I-R, II-R, III-R and mechanical ventilators— I-R, II R;
- M. Temperature control devices for patient, parenteral fluids, and blood—I-R, IIR,III-R; and
- N. Rapid infusion system for parenteral infusion—I-R, II-R, III-R.

3. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, IIR, III-R)

4. There shall be a designated trauma resuscitation area in the emergency department. (I-R, II-R)
5. There shall be X-ray capability with twenty-four (24)-hour coverage by technicians. (I-IH, II-IH, III-IA)
6. Nursing documentation for the trauma patient shall be on a trauma flow sheet approved by the trauma medical director and trauma nurse coordinator/trauma program manager. (I-R, II-R, III-R)

(B) The hospital shall meet **intensive care unit** (ICU) standards for trauma center designation.

1. There shall be a designated surgeon medical director or co-director for the ICU. (I-R, II-R, III-R)
2. A physician who is not the emergency department physician shall be on duty in the ICU or available in-house twenty-four (24) hours a day in a level I trauma center and shall be on call and available within twenty (20) minutes in a level II trauma center.
3. The minimum registered nurse/trauma patient ratio used shall be one to two (1:2). (I-R, II-R, III-R)
4. Registered nurses shall be credentialed in trauma care within one (1) year of assignment documenting a minimum of eight (8) hours of trauma-related continuing nursing education per year. (I-R, II-R, III-R)
5. Nursing care documentation shall be on a patient flow sheet approved by the trauma medical director and trauma nurse coordinator/trauma program manager. (I-R, II-R, III-R)
6. At the time of the initial review, nurses assigned to ICU shall have successfully completed or be registered for a provider ACLS course. (I-R, II-R, III-R).
7. In ICU's providing care for children, there shall be separate pediatric and adult ICUs or a combined ICU with nurses trained in pediatric intensive care. In ICUs providing care to children, registered nurses shall maintain credentialing in PALS, APLS, or ENPC. The requirement for PALS, APLS, or ENPC may be waived in adult centers where policy exists diverting injured children to a pediatric trauma center and where a pediatric trauma center is adjacent to the affected adult facilities, and a performance improvement filter reviewing any pediatric trauma patients seen is maintained. (I-R, II-R, III-R)
8. There shall be beds for trauma patients or comparable level of care provided until space is available in ICU. (I-R, II-R, III-R)
9. Equipment for resuscitation and to provide life support for the critically or seriously injured shall be available for the intensive care unit. In ICUs providing care for the pediatric patient, equipment with age appropriate sizes shall also be available. This equipment shall include, but not be limited to:
 - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, and a mechanical ventilator—I-R, II-R, III-R;
 - B. Oxygen source with concentration controls—I-R, II-R, III-R;
 - C. Cardiac emergency cart, including medications—I-R, II-R, III-R;
 - D. Temporary transvenous pacemakers— I-R, II-R, III-R;
 - E. Electrocardiograph, cardiac monitor, and defibrillator—I-R, II-R, III-R;
 - F. Cardiac output monitoring—I-R, II-R;
 - G. Electronic pressure monitoring and pulse oximetry—I-R, II-R;
 - H. End-tidal carbon dioxide monitor and mechanical ventilators—I-R, II-R, III-R;
 - I. Patient weighing devices—I-R, IIR,III-R;

- J. Temperature control devices—I-R, II-R, III-R;
 - K. Drugs, intravenous fluids, and supplies —I-R, II-R, III-R; and
 - L. Intracranial pressure monitoring devices—I-R, II-R.
10. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (IR, II-R, III-R)

(C) The hospital shall meet **post-anesthesia recovery room** (PAR) standards for trauma center designation.

- 1. Registered nurses and other essential personnel who are not on duty shall be on call and available within sixty (60) minutes. (I-R, II-R, III-R)
- 2. Equipment for resuscitation and to provide life support for the critically or seriously injured shall include, but not be limited to:
 - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator, sources of oxygen, and mechanical ventilator—I-R, II-R, III-R;
 - B. Suction devices—I-R, II-R, and III-R;
 - C. Electrocardiograph, cardiac monitor, and defibrillator—I-R, II-R, III-R;
 - D. Apparatus to establish central venous pressure monitoring—I-R, II-R;
 - E. All standard intravenous fluids and administration devices, including intravenous catheters—I-R, II-R, III-R;
 - F. Sterile surgical set for emergency procedures—I-R, II-R, and III-R;
 - G. Drugs and supplies necessary for emergency care—I-R, II-R, III-R;
 - H. Temperature control devices for the patient, for parenteral fluids, and for blood—I-R, II-R, III-R;
 - I. Temporary pacemaker—I-R, II-R, III-R;
 - J. Electronic pressure monitoring—IR, II-R; and
 - K. Pulmonary function measuring devices—I-R, II-R, III-R.

(D) **Radiological capabilities** for trauma center designation including a mechanism for timely interpretation to aid in patient management shall include:

- 1. In-house radiography- I-R, II-R, III-R
- 2. In-house radiographer- I-R, II-R
- 3. Angiography with interventional capability available twenty-four (24) hours a day with a one (1)-hour maximum response time from time of notification—I-R, II-R;
- 4. Sonography available twenty-four (24) hours a day with a thirty (30)-minute maximum response time—I-R, II-R;
- 5. In-house computerized tomography—I-R, II-R, III-R;
- 6. Computerized tomography technician—I-IH, II-IA, III-R available within 60 minutes
- 7. In-house MRI- I-R, II-R
- 8. MRI technologist- I-R, II-R 60 minute response time
- 9. Resuscitation equipment available to the radiology department—I-R, II-R, III-R;
- 10. Adequate physician and nursing personnel present with monitoring equipment to fully support the trauma patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department. Nurses providing care for the trauma patients that are not accompanied by a trauma nurse while in the radiology department during initial evaluation and resuscitation shall

maintain the same credentialing required of emergency department nursing personnel—I-R, II-R, III-R;

(E) There shall be documentation of adequate support services in assisting the patient's family from the time of entry into the facility to the time of discharge. (I-R, II-R, III-R)

(F) Medical surgical floors of a designated trauma center shall have the following personnel and equipment:

1. Registered nurses and other essential personnel on duty twenty-four (24) hours a day—I-R, II-R, III-R;
2. Equipment for resuscitation and to provide support for the injured patient including, but not limited to:
 - A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator, and sources of oxygen—I-R, II-R, III-R;
 - B. Suction devices—I-R, II-R, III-R;
 - C. Electrocardiograph, cardiac monitor, and defibrillator—I-R, II-R, III-R;
 - D. All standard intravenous fluids and administration devices and intravenous catheters—I-R, II-R, III-R; and
 - E. Drugs and supplies necessary for emergency care—I-R, II-R, III-R; and
3. Documentation that all equipment is checked according to the hospital preventive maintenance schedule—I-R, II-R, III-R.

(G) The operating room personnel, equipment, and procedures of a trauma center shall include, but not be limited to:

1. An operating room adequately staffed in-house twenty-four (24) hours a day at a level I and II center and with a response time for staff at a level III center of thirty (30) minutes with a back-up operating room staff on call and promptly available for level I, II, and II trauma centers.
2. Equipment including, but not limited to:
 - A. Operating microscope—I-R;
 - B. Thermal control equipment for patient, parenteral fluids, and blood—I-R, IIR, III-R;
 - C. X-ray capability—I-R, II-R, III-R;
 - D. Endoscopic capabilities, all varieties—I-R, II-R, III-R;
 - E. Instruments necessary to perform an open craniotomy—I-R, II-R; and
 - F. Monitoring equipment—I-R, II-R, III-R; and
3. Documentation that all equipment is checked according to the hospital preventive maintenance schedule—I-R, II-R, III-R;

(H) The following clinical laboratory services shall be available twenty-four (24) hours a day:

1. Standard analyses of blood, urine and other body fluids—I-R, II-R, III-R;
2. Blood typing and cross-matching—I-R, II-R, III-R;
3. Coagulation studies—I-R, II-R, III-R;
4. Comprehensive blood bank or access to a central blood bank and adequate hospital blood storage facilities—I-R, II-R, III-R;
5. Blood gases and pH determinations—I-R, II-R, III-R;
6. Serum and urine osmolality—I-R,II-R;

7. Drug and alcohol screening—I-R,II-R, III-R; and
8. A written protocol for prioritization of the trauma patient with other time critical patients I-R, II-R, III-R.

(I) The hospital shall have acute hemodialysis capability or a written transfer agreement. (I-R, II-R, III-R)

(J) The hospital shall have a physician- directed burn unit or a written transfer agreement. (I-R, II-R, III-R)

(K) The hospital shall have injury rehabilitation and spinal cord injury rehabilitation capability or a written transfer agreement. (I-R, II-R, III-R)

(L) The hospital shall possess pediatric trauma management capability or maintain written transfer agreements. (I-R, II-R, III-R)

(4) Standards for Programs in Performance Improvement and Improvement Patient Safety Program, Outreach, Public Education, and Training for Trauma Center Designation.

(A) There shall be an ongoing performance improvement and patient safety program designed to objectively and systematically monitor, review, and evaluate the quality and appropriateness of patient care, pursue opportunities to improve patient care, and resolve identified problems. (I-R, II-R, III-R)

(1) Any adult trauma center that annually admits one hundred (100) or more injured children younger than fifteen (15) shall have a pediatric-specific trauma PIPS program.

(2) Any adult trauma center that annually admits fewer than one hundred (100) injured children younger than fifteen (15) shall review their care through their PIPS program.

(B) The following additional performance improvement and patient safety measures shall be required:

1. Regular reviews of all trauma-related deaths—I-R, II-R, III-R;

2. A regular morbidity and mortality review, at least quarterly—I-R, II-R, III-R;

3. A regular multidisciplinary trauma conference that includes representation of all members of the trauma team, with minutes of the conferences to include attendance and findings—I-R, II-R, III-R;

4. Regular reviews of response times for physicians, nurses, and technicians required in these regulations (I, -R, II-R, III-R);

5. Regular reviews of neurotrauma care provision and outcome (GB p. 45)

6. Regular reviews of the reports generated by the Department of Health and Senior Services from the Missouri trauma registry and the head and spinal cord injury registry—I-R, II-R, and III-R;

7. Regular reviews of pre-hospital trauma care including inter-facility transfers and all pediatric patients seen in adult centers—I-R, II-R, III-R;

8. The receiving hospital shall provide, monitor and document bidirectional timely feedback to and from the EMS providers and referring hospital, if involved. This feedback shall include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within seventy-two (72) hours of admission or arrival of the trauma patient at the hospital if not admitted. When EMS does not provide patient care data on patient arrival or in a

timely fashion (recommended within 3 hours of patient delivery), this time frame does not apply. (I-R, II-R, III-R, IV-R)

9. Participation in reviews of regional systems of trauma care as established by the Department of Health and Senior Services—I-R, II-R, III-R; and

10. Trauma patients remaining greater than six (6) hours prior to transfer will be reviewed as a part of the performance improvement and patient safety program—IR, II-R, III-R.

(C) An **outreach program** shall be established to assure twenty-four (24)-hour availability of telephone consultation with physicians in the outlying region. (I-R)

(D) A **public education program** shall be established to promote injury prevention and trauma care and to resolve problems confronting the public, medical profession, and hospitals regarding optimal care for the injured. These must address major trauma issues as identified in that program's performance improvement and patient safety process. (I-R, II-R)

(E) The hospital shall be actively involved in local and regional emergency medical services systems by providing training and clinical resources. (I-R, II-R, III-R)

(F) There shall be a hospital-approved procedure for credentialing nurses in trauma care. (I-R, II-R, III-R)

1. All nurses providing care to severely injured patients and assigned to the emergency department shall complete the minimum trauma nursing courses described in section 3A1EII to become credentialed in trauma care within one (1) year of assignment and maintain 8 (eight) hours trauma continuing education per year thereafter. (I-R, II-R, III-R)

2. The content and format of any trauma nursing courses developed and offered by a hospital in place of the courses listed in section 3A1EII shall be developed in cooperation with the trauma medical director. This course must provide 16 (sixteen) hours of CEU's from an accrediting body recognized by a national accrediting organization. A copy of the course curriculum used should be reviewed by the department at time of designation and shall be filed with the department. (I-R, II-R, III-R)

3. Trauma nursing courses offered by level I and II centers or courses such as the Advanced Trauma Care for Nurses, Emergency Nursing Pediatric Course, or the Trauma Nurse Core Curriculum may be used to fulfill this requirement. To receive credit for this course, a nurse shall obtain advance approval for the course from the trauma medical director and trauma nurse coordinator/trauma program manager and shall present evidence of satisfactory completion of the course. (I-R, II-R, III-R)

(G) Hospital **diversion** information must be maintained to include date, length of time, and reason for diversion. This must be monitored as a part of the Performance Improvement and Patient Safety program and available when the hospital is site reviewed.

(H) Each trauma center shall have a **disaster plan**. A copy of this disaster plan must be maintained within the trauma center policies and procedures and should document the trauma services role in planning and response.

(5) Standards for the Programs in Trauma Research for Trauma Center Designation.

(A) The hospital and its staff shall support a **research program** in trauma as evidenced by any of the following:

1. Publications in peer reviewed journals—I-R;
2. Reports of findings presented at regional or national meetings—I-R;
3. Receipt of grants for study of trauma care—I-R; and
4. Production of evidence-based reviews—I-R.

(B) The hospital shall agree to cooperate and participate with the EMS Bureau in conducting epidemiological studies and individual case studies for the purpose of developing injury control and prevention programs. (I-R, II-R, III-R)

*AUTHORITY: section 190.185, RSMo Supp.2007 and section 190.241, HB 1790, 94th General Assembly, Second Regular Session, 2008. * Emergency rule filed Aug. 28, 1998, effective Sept. 7, 1998, expired March 5, 1999. Original rule filed Sept. 1, 1998, 2007, effective Aug. 30, 2007. Amended: Filed May 19, 2008, effective Jan. 30, 2009. *Original authority: 190.185, RSMo 1973, amended 1989, 1993, 1995, 1998, 2002 and 190.241, RSMo 1987, amended 1998, 2008.*

Title 19 - DEPARTMENT OF HEALTH AND SENIOR SERVICES
Division 30 – Division of Regulation and Licensure
Chapter 40 – Comprehensive Emergency Medical Services Systems Regulations
(April 21, 2011)

PROPOSED RULE

19 CSR 30-40.450 Standards for Level IV Trauma Center Designation for Adult and Pediatric Trauma Patients DRAFT

PURPOSE: This rule establishes standards for level IV trauma center designation.

EDITOR'S NOTE: IV-R after a standard indicates a requirement for a level IV trauma center. IV-IH after a standard indicates an in-house requirement for a level IV trauma center. IV-IA indicates an immediately available requirement for level IV trauma centers. IV-PA indicates a promptly available requirement for level IV trauma centers.

PUBLISHER'S NOTE: The secretary of state has determined that the publication of the entire text of the material which is incorporated by reference as a portion of this rule would be unduly cumbersome or expensive. This material as incorporated by reference in this rule shall be maintained by the agency at its headquarters and shall be made available to the public for inspection and copying at no more than the actual cost of reproduction. This note applies only to the reference material. The entire text of the rule is printed here.

(1) General Standards for Trauma Center Designation

(A) The hospital board of directors, administration, medical staff and nursing staff shall demonstrate a commitment to quality trauma care. Methods of demonstrating the commitment shall include, but not be limited to, a board resolution that the hospital governing body agrees to establish policy and procedures for the maintenance of services essential for a trauma center; assure that all trauma patients will receive medical care at the level of the hospital's designation; commit the institution's financial, human and physical resources as needed for the trauma program; and establish a priority admission for the trauma patient to the full services of the institution. (IV-R)

(B) Trauma centers shall agree to accept all trauma victims appropriate for the level of care provided at the hospital, regardless of race, sex, creed or ability to pay. (IV-R)

(C) The hospital shall demonstrate evidence of a trauma program. The trauma program shall be available twenty-four (24) hours a day, seven (7) days a week to treat and evaluate trauma patients and meet the following requirements:

1. Maintain a trauma team that at a minimum consists of; (IV-R)

A. A core team to provide administrative oversight;

(I) A physician experienced in diagnosing and treating trauma, usually the trauma medical director; and

(II) At least one other health care professional or qualified individual credentialed in trauma care as determined by the hospital, usually the trauma program manager/coordinator;

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2. A clinical team appropriate to the center level designation that includes trauma care providers available twenty-four (24) hours a day, seven (7) days a week and other trauma center clinical staff when applicable.
3. The trauma team has appropriate experience to maintain skill and proficiency to care for trauma patients. The hospital shall maintain evidence of this by documenting the following:
 - A. Trauma team members meet position qualifications and continuing education requirements as outlined in these regulations and by the hospital; (IV-R)
 - B. The core team and members of the trauma call roster shall participate in at least half of the regular, ongoing trauma program peer review and performance improvement and patient safety meetings as shown in meeting attendance documents; each trauma service shall define regular attendance which shall not be less than fifty (50) percent. The trauma medical director shall ensure and document dissemination of information and findings from the peer review and performance improvement and patient safety meetings to the trauma team members (IV-R)
 - C. Trauma team members document continued experience in management of trauma patients to maintain skill levels as defined by the hospital, trauma medical director, and these regulations; (IV-R)
 - D. All members of the emergency department trauma call roster in Level IV trauma centers shall document a minimum of average eight (8) hours every year of continuing education in trauma care, four (4) of which must be applicable to pediatric trauma, as determined appropriate by the trauma center medical director and as appropriate to the practitioner's level of responsibility; and (IV-R)
 - E. The trauma medical director and program manager show participation in the regional EMS committee process, including review of regional outcome data on quality of patient care as part of the performance improvement and patient safety process. (IV-R)
4. Maintain a multidisciplinary team, in addition to the trauma team to support the care of trauma patients; (IV-R)
 - A. The multidisciplinary team shall include an appropriate representative from hospital units as appropriate for care of each trauma patient. The units represented on the multidisciplinary team may include but not be limited to: administration, emergency medical services, pharmacy, laboratory, radiology, and discharge planning;
 - B. The multidisciplinary team members or representatives shall attend at least half of the trauma program performance improvement and patient safety meetings which shall be documented in meeting minutes and attendance lists. Each trauma service shall define regular attendance which shall not be less than fifty (50) percent.

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(D) A level IV trauma center shall identify, stabilize according to its capability and patient condition, and facilitate rapid transfer from the emergency department of a severely injured trauma patient to a higher level trauma center according to department transport protocol or department approved community plan. Situations in which a severely injured trauma patient might be taken to a Level IV center by EMS per department transport protocol or department approved community or regional plan include but are not limited to immediate life threatening situations such as cardiac or respiratory arrest. For other patients included in the department destination protocol or department approved community or regional plan transported to a Level IV center, the Level IV center shall evaluate and transfer as appropriate to higher level trauma center according to department or department approved community or regional plan. The level IV center shall assess, treat, and release or observe all other injured patients as appropriate.

(E) The hospital shall appoint a board-certified or board-admissible physician to serve as the trauma medical director. (IV-R)

1. There shall be a job description and organization chart depicting the relationship between the trauma medical director and other services.

2. The trauma medical director shall be a member of the emergency department trauma call roster and participate in the care of trauma patients.

3. The trauma medical director shall be responsible for the oversight of the education and training of the medical and nursing staff in trauma care.

4. The trauma medical director shall document a minimum average of sixteen (16) hours of continuing medical education (CME) in trauma care every year, four (4) of which shall be in pediatric trauma care.

(F) The trauma program manager shall be a registered nurse or other qualified individual. (IV-R)

1. There shall be a job description and organization chart depicting the relationship between the trauma nurse coordinator/trauma program manager and other services.

2. The trauma nurse coordinator/trauma program manager shall document a minimum average of eight (8) hours of continuing education in trauma care every year, four (4) of which shall be in pediatric trauma care.

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(G) By the time of the initial review, all members of the licensed trauma care provider emergency department trauma call roster shall have successfully completed or be registered for a provider Advanced Trauma Life Support (ATLS) course or an Advanced Trauma Care for Nurses (ATCN) course. Each licensed trauma care provider on the emergency department trauma call roster shall maintain current certification in either ATLS or ATCN, except for physicians who are board-certified in emergency medicine who are strongly encouraged to remain current. (IV-R) ATLS is incorporated by reference in this rule as published by the American College of Surgeons in 2003 and is available at American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. ATCN is incorporated by reference in this rule as published in 2003 by the Society of Trauma Nurses and is available at the Society of Trauma Nurses, 1926 Waukegan Road, Suite 100, Glenview, Illinois 60025. This rule does not incorporate any subsequent amendments or additions. Update reference (IV-R)

(H) The hospital shall have a trauma team activation protocol that establishes the criteria used to rank trauma patients according to the severity and type of injury and identifies the persons authorized to notify trauma team members when a severely injured patient is en route or has arrived at the trauma center. (IV-R)

1. The trauma team activation protocol shall provide for immediate notification and response requirements for trauma team members when a severely injured patient is en route to the trauma center. (IV-R)

(I) The hospital shall have written transfer agreements and an expedited transfer processes to higher levels of care for all injured patients.

(J) The hospital shall demonstrate that there is a plan for adequate post-discharge follow-up on trauma patients and repatriation if indicated. (IV-R)

(K) There shall be a lighted designated helicopter landing area to accommodate incoming medical helicopters. (IV-R)

1. The landing area shall serve as the receiving and take-off area for medical helicopters and shall be cordoned off from the general public when in use to assure its continual availability and safe operation. (IV-R)

2. It is recommended that the landing area shall be no more than three (3) minutes from the emergency department. (IV-R)

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(L) A Missouri trauma registry shall be completed on each patient who sustains a traumatic injury and meets the following criteria: Includes at least one (1) code within the range of the following injury diagnostic codes as defined in the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9)-(CM) 800-959.9 which is incorporated by reference in this rule as published by the Centers for Disease Control and Prevention in 2006 and is available at National Center for Health Statistics, 1600 Clifton Road, Atlanta, GA 30333. update reference This rule does not incorporate any subsequent amendments or additions. Excludes all diagnostic codes within the following code ranges: 905–909.9 (late effects of injury), 910–924.9 (superficial injuries, including blisters, contusions, abrasions, and insect bites), 930–939.9 (foreign bodies), and must include one of the following criteria: hospital admission, patient transfer out of facility, or death resulting from the traumatic injury (independent of hospital admission or hospital transfer status). The registry shall be submitted electronically in a format defined by the Department of Health and Senior Services. Electronic data shall be submitted quarterly, ninety (90) days after the quarter ends. The trauma registry must be current and complete. A patient log with admission date, patient name, and injuries must be available for use during the site review process. Information provided by hospitals on the trauma registry shall be subject to the same confidentiality requirements and procedures contained in section 192.067, RSMo. The trauma care data elements shall be those identified and defined by the National Trauma Data Standard which is incorporated by reference in this rule as published by the American College of Surgeons in 2008 and is available at the American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. (IV-R) [add QA group rec.s](#)

(M) The hospital shall have a plan to notify an organ or tissue procurement organization and cooperate in the procurement of anatomical gifts in accordance with the provisions in section 194.233, RSMo. (IV-R)

(N) A level IV trauma center shall be either a currently designated critical access hospital or be located in rural places of the state as of the effective date of these regulations. (IV-R)

(2) Medical Staffing Standards for Trauma Center Designation

(A) There shall be a delineation of privileges for the trauma service staff made by the medical staff credentialing committee. (IV-R)

(B) All members of the emergency department trauma call roster shall comply with the availability and response requirements of this rule. If not on the hospital premises, trauma team members who are immediately available shall carry electronic communication devices at all times to permit contact by the hospital and shall respond immediately to a contact by the hospital. (IV-R IA)

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(C) The level IV center shall have a mechanism for adequate pre-notification of the physician on-call for trauma coverage for patients arriving by EMS such that the physician on-call for trauma shall be present in the ED with adequate pre-notification when a severely injured patient arrives and as appropriate for other injured patients' conditions.

(D) The level IV trauma center shall have someone available in the ED 24 (twenty-four) hours a day 7 (seven) days a week who can establish and manage an airway and manage respiratory and circulatory compromise.

(3) Standards for Hospital Resources and Capabilities for Trauma Center Designation

(A) The hospital shall meet emergency department standards for trauma center designation.

1. The emergency department staffing shall ensure immediate and appropriate care of the trauma patient. (IV-R)

A. The physician director of the emergency department shall be a board-certified or board-admissible physician by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada. (IV-R)

B. There shall be a physician trained in the care of the critically injured as evidenced by credentialing in ATLS and current in trauma CME as previously defined in the emergency department. ATLS is incorporated by reference in this rule as published by the American College of Surgeons in 2003 and is available at American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions update reference. (IV-RIA)

C. All emergency department trauma care providers shall successfully complete the ATLS or ATCN courses. All nurses functioning as trauma care providers shall maintain current ATCN certification. Physicians certified by boards other than emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada and treat trauma patients in the emergency department are required to complete the ATLS course and maintain current ATLS certification. (IV-R)

D. There shall be written policies defining the relationship of the emergency department physicians to other members of the trauma team. (IV-R)

E. All registered nurses assigned to the emergency department shall be credentialed in trauma nursing by the hospital within one (1) year of assignment. (IV-R)

(I) Registered nurses competent in trauma nursing shall document a minimum of eight (8) hours of trauma-related continuing nursing education per year. (IV-R)

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(II) Registered nurses competent in trauma care shall obtain current provider status in the Trauma Nurse Core Curriculum or Advanced Trauma Care for Nurses and either Pediatric Advanced Life Support (PALS), Advanced Pediatric Life Support (APLS), or Emergency Nursing Pediatric Course (ENPC) within one (1) year of employment in the emergency department and maintain thereafter. The Trauma Nurse Core Curriculum is incorporated by reference in this rule as published in 2007 by the Emergency Nurses Association and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. Advanced Trauma Care for Nurses is incorporated by reference in this rule as published in 2003 by the Society of Trauma Nurses and is available at the Society of Trauma Nurses, 1926 Waukegan Road, Suite 100, Glenview, IL 60025. This rule does not incorporate any subsequent amendments or additions. Pediatric Advanced Life Support is incorporated by reference in this rule as published in 2005 by the American Heart Association and is available at the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231. This rule does not incorporate any subsequent amendments or additions. Advanced Pediatric Life Support is incorporated by reference in this rule as published in 2007 by the American Academy of Pediatrics and the American College of Emergency Physicians and is available at the American Academy of Pediatrics, 141 Northwest Point Boulevard, Post Office Box 927, Elk Grove Village, Illinois 60009-0927 or the American College of Emergency Physicians, 1125 Executive Circle, Post Office Box 619911, Dallas, Texas 75261-9911 or Jones and Bartlett Publishers, 40 Tall Pine Drive, Sudbury, Massachusetts 01776. This rule does not incorporate any subsequent amendments or additions. The Emergency Nursing Pediatric Course is incorporated by reference in this rule as published by the Emergency Nurses Association in 2004 and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. (IV-R) (verify most up-to-date reference)

2. Equipment for resuscitation and life support with age appropriate sizes for the critically or seriously injured shall include the following:

- A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, and sources of oxygen—(IV-R);
- B. Suction devices—(IV-R);
- C. Electrocardiograph, cardiac monitor, and defibrillator—(IV-R);
- D. Central line insertion equipment—(IV-R);
- E. All standard intravenous fluids and administration devices including intravenous and intraosseous catheters—(IV-R);
- F. Drugs and supplies necessary for emergency care, including length- weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight (I-R, II-R, III-R)
- G. Blood pressure cuffs, chest tubes, nasogastric tubes and urinary drainage apparatus (I-R, II-R, II-R);
- H. Sterile surgical sets for procedures standard for the emergency department—(IV-R);
- I. Gastric lavage equipment—(IV-R);
- J. Drugs and supplies necessary for emergency care—(IV-R);

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K. Two-way communication link with emergency medical service (EMS) vehicles—(IV-R);

L. End-tidal carbon dioxide monitor—(IV-R);

M. Temperature control devices for patient and resuscitation fluids—(IV-R);

N. Rapid infusion system for parenteral infusion—(IV-R); and

O. Immobilization equipment including C-collars. (IV-R)

3. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (IV-R)

4. There shall be a designated trauma resuscitation area in the emergency department. (IV-R)

5. There shall be X-ray capability with twenty-four (24)-hour coverage by technicians. (IV-R-IA)

A. Resources shall include:

(I) Resuscitation equipment available to the radiology department (IV-R);

(II) Adequate physician and nursing personnel available with monitoring equipment to fully support the trauma patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department; and (IV-R)

(III) The hospital shall have a mechanism for timely interpretation of radiology exams to aid in patient management. (IV-R; IV-PA)

(IV) There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (IV-R)

6. Nursing documentation for the trauma patient shall be on a trauma flow sheet approved by the trauma medical director and trauma nurse coordinator/trauma program manager. (IV-R)

(B) The hospital shall have written transfer agreements to higher levels of care for all injured patient. (IV-R)

(C) The hospital shall have a written transfer agreement for burn patients. (IV-R)

(D) The hospital shall have written transfer agreement for pediatric trauma management. (IV-R)

(E) There shall be documentation of adequate support services in assisting the patient's family from the time of entry into the facility to the time of discharge. (IV-R)

(F) The following clinical laboratory services shall be available twenty-four (24) hours a day:

1. Standard analyses of blood, urine and other body fluids; (IV-R)

2. Coagulation studies; (IV-R)

3. Blood bank or access to a central blood bank and adequate hospital blood storage facilities; (IV-R)

4. Blood gases and pH determinations; (IV-R)

5. Drug and alcohol screening; and (IV-R)

6. A written protocol for prioritization of the trauma patient with other time critical patients. (IV-R)

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(4) Standards for Hospital Performance Improvement, Patient Safety, Outreach, Public Education, and Training Programs for Trauma Center Designation

(A) There shall be an ongoing performance improvement and patient safety program designed to objectively and systematically monitor, review, and evaluate the quality and appropriateness of patient care, pursue opportunities to improve patient care, and resolve identified problems. (IV-R)

(B) The following additional performance improvement and patient safety measures shall be required:

1. Regular reviews of all trauma patients including review of all trauma-related deaths—(IV-R);
2. A regular morbidity and mortality review, at least quarterly—(IV-R);
3. A regular multidisciplinary trauma conference that includes representation of all members of the trauma team, with minutes of the conferences to include attendance and findings—(IV-R);
4. Regular reviews of the reports generated by the Department from the Missouri trauma registry and the head and spinal cord injury registry—(IV-R);
5. Regular reviews of pre-hospital trauma care including inter-facility transfers
6. Review of all pediatric and adult trauma patients seen in level IV centers specifically addressing—(IV-R);
 - a. All trauma patients who are not transferred to a higher level of care;
 - b. All trauma patients remaining greater than sixty (60) minutes prior to transfer
7. Participation in reviews of regional systems of trauma care as established by the Department— (IV-R); and

(C) The hospital shall be actively involved in local and regional emergency medical services systems by providing training and clinical resources. (IV-R)

(D) The receiving hospital shall provide, monitor, and document bidirectional timely feedback to and from the EMS providers and referring hospital, if involved. This feedback shall include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within seventy-two (72) hours of admission or arrival of a trauma patient at the hospital if not admitted. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame -does not apply. (IV-R)

(E) There shall be a hospital-approved procedure for credentialing nurses in trauma care. (IV-R)

1. All nurses providing care to severely injured patients and assigned to the emergency department shall complete the minimum trauma nursing courses described in section 3A1EII to become credentialed in trauma care within one (1) year of assignment and maintain 8 (eight) hours trauma continuing education per year thereafter. (IV-R)

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2. The content and format of any trauma nursing courses developed and offered by a hospital in place of the courses listed in section 3A1EII shall be developed in cooperation with the trauma medical director. This course must provide 16 (sixteen) hours of CEU's. A copy of the course curriculum used shall be filed with the department. (IV-R)

3. Trauma nursing courses offered by level I and II centers or courses such as the Advanced Trauma Care for Nurses, Emergency Nursing Pediatric Course, or the Trauma Nurse Core Curriculum may be used to fulfill this requirement. To receive credit for this course, a nurse shall obtain advance approval for the course from the trauma medical director and trauma nurse coordinator/trauma program manager and shall present evidence of satisfactory completion of the course. (IV-R)

(F) A public education program shall be established to promote injury prevention. (IV-R)

(G) Hospitals shall maintain a hospital trauma diversion protocol in order to allow best resource management within a given EMS region. Hospital diversion information must be maintained to include date, length of time, and reason for diversion. This must be monitored as a part of the Performance Improvement and Patient Safety program, and available when the hospital is site reviewed. (IV-R)

(H) Each trauma center shall have a disaster plan. A copy of this disaster plan must be maintained within the trauma center policies and procedures and should document the trauma services role in planning and response. (IV-R)

(5) Standards for the Programs in Trauma Research for Trauma Center Designation.

(A) The hospital shall agree to cooperate and participate with the Department in conducting epidemiological studies and individual case studies for the purpose of developing injury control and prevention programs. (IV-R)

AUTHORITY: section 190.185, RSMo Supp. 200[7]8 and section 190.241, HB 1790, 94th General Assembly, Second Regular Session, 2008. Emergency rule filed Aug. 28, 1998, effective Sept. 7, 1998, expired March 5, 1999. Original rule filed Sept. 1, 1998, effective Feb. 28, 1999. Amended: Filed Jan. 16, 2007, effective Aug. 30, 2007. Amended: Filed May 19, 2008, effective Jan. 30, 2009.*

**Original authority: 190.185, RSMo 1973, amended 1989, 1993, 1995, 1998, 2002 and 190.241, RSMo 1987, amended 1998, 2008.*

*PUBLIC COST: This proposed amendment will cost state agencies or political subdivisions **put in number** in the aggregate.*

*PRIVATE COST: This proposed amendment will cost private entities **put in number** in the aggregate.*

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NOTICE TO SUBMIT COMMENTS: Anyone may file a statement in support of or in opposition to this proposed amendment with Teresa Generous, Director, Department of Health and Senior Services, Division of Regulation and Licensure, PO Box 570, Jefferson City, MO 65102. To be considered, comments must be received within thirty (30) days after publication of this notice in the Missouri Register. No public hearing is scheduled.

DRAFT

**19 CSR 30-40.440 Standards for Pediatric Trauma Center Designation 4/21/2011
DRAFT**

PURPOSE: This rule establishes standards for pediatric trauma center designation.

(1) General Standards for Pediatric Trauma Center Designation.

(A) A pediatric trauma center is a children's hospital, which may be a freestanding children's hospital or a separate administrative entity within a larger general hospital organization, such as a children's hospital within a hospital or a full service general hospital with comprehensive pediatric inpatient subspecialty services similar to those found in a freestanding children's hospital or a children's hospital within a hospital Adult Hospitals that pursue verification as pediatric trauma centers must meet the same resource requirements as adult trauma centers, in addition to pediatric resource requirements. A pediatric trauma center should have sufficient volume of institutional experience with major pediatric injuries to maintain the clinical skills of pediatric trauma team members.

1. A level I pediatric trauma center must annually admit 200 or more injured children younger than 15 years.

2. A level II pediatric trauma center must annually admit 100 or more injured children younger than 15 years.

3. A pediatric capable center is a current adult trauma center that admits injured children younger than 15 year or a non-designated center that is seeking adult trauma center designation concurrently with pediatric trauma center designation. The pediatric capable trauma center shall evaluate and transfer as appropriate to higher level trauma center according to department or department approved community or regional plan. The pediatric capable trauma center shall assess, treat, and release or observe all other injured patients as appropriate.

(B) The hospital board of directors, administration, medical staff and nursing staff shall demonstrate a commitment to quality pediatric trauma care and shall treat any pediatric trauma patient presented to the facility for care. Methods of demonstrating the commitment shall include, but not be limited to, a board resolution that the hospital governing body agrees to establish policies and procedures for the maintenance of the services essential to a pediatric trauma center; assure that all pediatric trauma patients will receive medical care that meets the standards of this rule; commit the institution's financial, human and physical resources as needed for the trauma program; and establish a priority for the pediatric trauma patient to the full services of the institution. (I-R, II-R, PC-R)

(C) Trauma centers shall agree to accept all trauma victims appropriate for the level of care provided at the hospital, regardless of race, sex, creed or ability to pay. (I-R, II-R, PC-R)

(D) The hospital shall demonstrate evidence of a pediatric trauma program that provides the trauma team with appropriate experience to maintain skill and proficiency in the care of pediatric trauma patients. Such evidence shall include meeting of continuing education unit requirements by all professional staff, documented regular attendance by

all core trauma surgeons and liaison representation from neurosurgeons, orthopedic surgeons, emergency medicine physicians, critical care medicine, and anesthesiologists at trauma program performance improvement and patient safety program meetings, documentation of continued experience as defined by the trauma medical director in management of sufficient numbers of severely injured patients to maintain skill levels, and outcome data on quality of patient care as defined by regional emergency medical service committees. Regular attendance shall be defined by each trauma service, but shall be not less than fifty percent (50%) of all meetings. The trauma medical director must ensure and document dissemination of information and findings from the peer review meetings to the non-core surgeons on the trauma call roster. (I-R, II-R, PC-R)

(E) The hospital shall have a pediatric trauma team activation protocol that establishes the criteria used to rank trauma victims according to the severity and type of injury and identifies the persons authorized to notify trauma team members when a major pediatric trauma patient is en route or has arrived at the pediatric trauma center. That protocol shall provide for immediate notification and rapid response requirements for trauma team members. (I-R, II-R, PC-R)

(F) There shall be a lighted designated helicopter landing area at the trauma center to accommodate incoming medical helicopters. (I-R, II-R, PC-R)

1. The landing area shall serve solely as the receiving and take-off area for medical helicopters and shall be cordoned off at all times from the general public to assure its continual availability and safe operation. (I-R, II-R, PC-R)

2. The landing area shall be on the hospital premises no more than three (3) minutes from the emergency room. (I-R, II-R, PC-R)

(G) The hospital shall appoint a board-certified or board-admissible pediatric surgeon to serve as pediatric trauma medical director (I-R, II-R).

1. The pediatric trauma medical director shall document a minimum average of sixteen (16) hours of trauma-related external continuing medical education (CME) every year, of which twelve (12) hours over three (3) years must be related to clinical pediatric trauma care..

2. There shall be a job description and organizational chart depicting the relationship between the pediatric trauma medical director and other services.

(H) The hospital shall appoint a board-certified or board admissible general surgeon credentialed by the hospital to provide pediatric trauma care to serve as pediatric trauma medical director (PC-R).

1. The pediatric trauma medical director shall document a minimum average of sixteen (16) hours of trauma-related external continuing medical education (CME) every year, of which twelve (12) hours over three (3) years must be related to clinical pediatric trauma care.

2. There shall be a job description and organizational chart depicting the relationship between the pediatric trauma medical director and other services.

(I) A registered nurse shall be appointed to serve as the pediatric trauma nurse coordinator/manager. (I-R, IIR, PC-R)

1. The pediatric trauma program nurse coordinator/manager shall be full time and dedicated to the pediatric trauma service in a level I center and recommended to be dedicated in a level II center. (I-R, II-R)
2. The pediatric trauma nurse coordinator/manager shall document a minimum average of sixteen (16) hours of trauma-related continuing nursing education every year, of which twelve (12) hours over three (3) years must be related to pediatric trauma care.
3. There shall be a job description and organization chart depicting the relationship between the pediatric trauma nurse coordinator and other services. (I-R, II-R, PC-R)

(J) By the time of the initial review, trauma surgeons who comprise the pediatric surgical trauma call roster shall have successfully completed or be registered for a provider advanced trauma life support (ATLS) course and remain current thereafter. (I-R, II-R, PC-R)

(K) All members of the pediatric surgical trauma call roster shall document a minimum average of eight (8) hours of trauma-related CME every year, four (4) of which shall be related to pediatric trauma care. (I-R, II-R, PC-R)

(L) The hospital shall be able to document active involvement in local and regional emergency medical services (EMS) systems. The hospital can demonstrate involvement in the local and regional EMS programs by participating in EMS training programs and joint educational programs regarding the pediatric patient; providing appropriate clinical experience and EMS system quality assessment and quality assurance mechanisms; and assisting in the development of regional policies and procedures. (I-R, II-R, PC-R)

(M) The hospital shall have a plan to notify an organ or tissue procurement organization and cooperate in the procurement of anatomical gifts in accordance with the provisions in section 194.233, RSMo. (I-R, II-R, PC-R)

(N) All pediatric trauma centers shall support and fully participate in the Missouri trauma registry and shall belong to the Missouri poison control network. (I-R, II-R, PC-R)

(O) A Missouri trauma registry shall be completed on each patient who sustains a traumatic injury and meets the following criteria: Includes at least one (1) code within the range of the following injury diagnostic codes as defined in the International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9)-(CM) 800-959.9 which is incorporated by reference in this rule as published by the Centers for Disease Control and Prevention in 2006 and is available at National Center for Health Statistics, 1600 Clifton Road, Atlanta, GA 30333. This rule does not incorporate any subsequent amendments or additions. Excludes all diagnostic codes within the following code ranges: 905-909.9 (late effects of injury), 910-924.9 (superficial injuries, including blisters, contusions, abrasions, and insect bites), 930-939.9 (foreign bodies), and must include one of the following criteria: hospital admission, patient transfer into or out of

facility; or death resulting from the traumatic injury (independent of hospital admission or hospital transfer status). The registry shall be submitted electronically in a format defined by the Department of Health and Senior Services. Electronic data shall be submitted quarterly, ninety (90) days after the quarter ends. The trauma registry must be current and complete. A patient log with admission date, patient name, and injuries must be available for use during the site review process. Information provided by hospitals on the trauma registry shall be subject to the same confidentiality requirements and procedures contained in section 192.067, RSMo. The trauma care data elements shall be those identified and defined by the National Trauma Data Standard which is incorporated by reference in this rule as published by the American College of Surgeons in 2008 and is available at the American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, PC-R) [update reference; update with QA rec.s](#)

(2) Hospital Organization Standards for Pediatric Trauma Center Designation.

(A) There shall be a delineation of privileges for the trauma team staff made by the medical staff credentialing committee. (I-R, II-R, PC-R)

(General/Pediatric Trauma Surgery Req.)

(B) Surgeons who are board-certified or board-admissible or complete an alternate pathway as documented and defined by the trauma medical director using the criteria established by the American College of Surgeons (ACS) in the current Resource for Optimal Care Document in the following specialties and who are credentialed by the hospital for pediatric trauma care shall be on the trauma center staff and/or be available to the patient as indicated. The Resource for Optimal Care Document is incorporated by reference in this rule as published by the American College of Surgeons in 2006 and is available at the American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions.

(C) The pediatric trauma surgeon on call shall be physically present in-house twenty-four (24) hours a day at a level pediatric trauma center and shall meet all major trauma patients in the emergency department at the time of the patient's arrival within fifteen (15) minutes of notification with adequate pre-notification. In a level II pediatric trauma center, the pediatric trauma surgeon shall be immediately available. In a level I and II pediatric trauma center, this requirement may be fulfilled by a senior resident post-graduate clinical year three (3) or above in general surgery who is ATLS-certified and able to deliver surgical treatment immediately and provide control and leadership for care of the pediatric trauma patient. When senior residents are used to fulfill availability requirements, the pediatric trauma surgeon shall be immediately available. (I-R/IH, II-R/IA)

(D) All members of the pediatric surgical trauma call roster shall comply with the availability and response requirements in subsection (2)(D) of this rule. If not on the hospital premises, trauma team members who are immediately available shall carry electronic communication devices at all times to permit contact by the hospital and shall respond immediately to a contact by the hospital. (IR, II-R, PC-R)

E. In a level I or II pediatric trauma center, call rosters providing back-up coverage will be maintained for pediatric and general trauma surgeons. In a pediatric capable center, call rosters providing for back-up coverage for general trauma surgeons will be maintained or a written transfer agreement to a level I or II trauma center provided.

(Specialists: In Level I and II Pediatric Trauma Centers)

(F) Pediatric specialists representing the following specialties shall be on staff as appropriate to center level designation and ideally shall be board-certified or board-admissible and credentialed by the hospital in trauma care and shall have sufficient training and experience in pediatric trauma care and be knowledgeable about current management of pediatric trauma in their specialty as determined by the hospital: anesthesiology, cardiac surgery, emergency medicine, neurologic surgery, ophthalmic surgery, oral surgery-dental, orthopedic surgery, otorhinolaryngologic surgery, pediatric surgery; microsurgery, hand surgery, plastic and maxillofacial surgery, thoracic surgery, radiology and rehabilitation, urologic surgery, and obstetric and gynecologic surgeons.

(G) Pediatric specialists representing the following non-surgical specialties shall be on call and available as appropriate to level of center designation: cardiology, chest medicine, forensic medicine, gastroenterology, hematology, infectious diseases, nephrology, neurology, pathology, psychiatry and neonatology.

(H) (Specific Staffing)

In a Level I Pediatric Trauma Center:

At least 2 surgeons who are board certified or admissible in pediatric surgery

At least 1 board certified or admissible orthopedic surgeon with pediatric fellowship training and one additional board certified or eligible orthopedic surgeon with documented skills and experience in pediatric trauma care as credentialed by the center.

At least 1 board certified or admissible neurosurgeon in pediatric neurosurgery and one additional board certified or admissible general neurosurgeon with documented skills and experience in pediatric trauma care as credentialed by the center.

At least two (2) physicians who are board certified or admissible in pediatric critical care medicine or board certified or admissible in pediatric surgery and surgical critical care.

At least 2 physicians who are board certified or admissible in pediatric emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada.

Pediatric intensive care unit and pediatric section of emergency department must be staffed by individuals credentialed by the hospital to provide pediatric trauma care in their respective areas

In a Level II Pediatric Trauma Center

At least 1 board certified or admissible pediatric surgeon. If a board certified or admissible pediatric surgeon is not available, option two shall include the following:

1. A letter from the chief of medical staff indicating a critical need in the trauma program, due to limited physician resources in pediatric surgery within the hospital medical staff.
2. Documentation of credentialing by the hospital to provide pediatric injury care.
3. Board certification or admissibility in general surgery.
4. Documentation of current status as a provider or instructor in Advanced Trauma Life Support program.
5. Documentation of current status as a provider or instructor in Pediatric Advanced Life Support program.
6. Documentation of participation in the pediatric trauma performance improvement program.
7. Documentation of trauma organization membership or attendance at local, regional, and national trauma meetings during the past three years.
8. A list of at least 75 (seventy-five) patients less than 15 (fifteen) years of age treated by the surgeon during the past three years with accompanying Injury Severity Score and outcome data.

At least 1 board certified or admissible orthopedic surgeon with documented skills and experience in pediatric trauma care as credentialed by the center.

At least 1 board certified or admissible general neurosurgeon with documented skills and experience in pediatric trauma care as credentialed by the center.

The pediatric intensive care unit shall be staffed by physicians that are board certified or admissible in pediatric critical care or board certified or admissible in pediatric surgery and surgical critical care and credentialed by the hospital to provide pediatric trauma care.

The pediatric section of the emergency department shall ideally be staffed by physicians that are board certified or admissible in emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada. If a board certified or admissible emergency medicine physician is not available, option two shall include the following:

1. A letter from the trauma medical director indicating this critical need in the trauma program because of the physician's experience or the limited physician resources in emergency medicine within the hospital trauma program.
2. Documentation that the emergency medicine physician completed an accredited residency training program in that specialty. This completion must be certified by a letter from the program director.
3. Documentation of current status as a provider or instructor in ATLS.

4. A list of the forty-eight (48) hours of trauma-related continuing medical education during the past three (3) years.
5. Documentation that the emergency physician is present for at least fifty (50) percent of the trauma performance improvement and educational meetings.
6. Documentation of membership or attendance at local and regional or national trauma meetings during the past three (3) years.
7. Performance improvement assessment by the trauma medical director and the director of the emergency department demonstrating that care provided by the emergency physician compares favorably with the care of the other members of the emergency department on the trauma call panel.

In a Pediatric Capable Trauma Center

At least 1 board certified or admissible trauma surgeon credentialed for pediatric trauma care

At least 1 board certified or admissible orthopedic surgeon with documented skill and experience in pediatric trauma care as credentialed by the center.

At least 1 board certified or admissible emergency medicine physician by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada credentialed for pediatric trauma care

Response Requirements

I. Surgeons who are board-certified or board-admissible and who are credentialed by the hospital for pediatric trauma care shall be on the trauma center staff.

1. Pediatric Neurologic surgery—I-IA, II-IA.

A. A pediatric neurosurgeon shall be available and dedicated to the hospital's pediatric trauma service in a level I pediatric trauma center.

B. The neurologic surgery staffing requirement may be fulfilled by a neurosurgeon who is experienced in the care of pediatric patients with neurologic trauma, able to deliver surgical treatment immediately, and can provide control and leadership for the care of the pediatric patient with neural trauma and who has been approved by the chief of neurosurgery for care of pediatric patients with neurologic trauma.

C. The neurosurgeon shall be capable of initiating measures toward stabilizing the patient, and performing diagnostic procedures.

D. A pediatric capable center shall have a documented plan, transfer agreement and expedited transfer process for neurologic surgery back-up with appropriate hemodynamic support capability for transfer. The plan shall ensure that once a potential need for neurosurgical intervention is identified that the pediatric trauma patient can be evaluated by neurosurgery and in the operating room of the receiving hospital as expeditiously as possible.

2. Cardiac/Thoracic surgery—I-R/PA.

A. Level II and pediatric capable pediatric trauma centers shall have a documented plan, transfer agreement and expedited transfer process for cardiothoracic surgery back-up with appropriate hemodynamic support capability for transfer. The plan shall ensure that once a potential need for cardiothoracic surgical intervention is identified that the pediatric

trauma patient can be evaluated by cardiothoracic surgery and in the operating room of the receiving hospital as expeditiously as possible

3. Pediatric Critical Care-- I-R/IH, II-R/IA
4. Obstetric-gynecologic surgery—IR/PA, II-R/PA.
5. Ophthalmic surgery—I-R/PA, IIR/PA.
6. Orthopedic surgery—I-R/PA, II-R/PA, PC-R/PA.
7. Maxillofacial trauma surgery—IR/PA, II-R/PA.
8. Otorhinolaryngologic surgery—I-R/PA, II-R/PA.
9. Trauma surgeon credentialed and privileged in pediatric trauma care—PC-IA,
10. Plastic surgery—I-R/PA, II-R/PA
11. Urologic surgery—I-R/PA, II-R/PA
12. Emergency medicine—I-R/IH, IIR/IH, PC-R/IH
13. Cardiology—I-R/PA, II-R/PA,
14. Chest pulmonary medicine—IR/PA, II-R/PA,
15. Gastroenterology—I-R/PA, II-R/PA,
16. Hematology—I-R/PA, II-R/PA,
17. Infectious diseases—I-R, II-R
18. Nephrology—I-R/PA, II-R/PA,
19. Pathology—I-R, II-R, PC-R.
20. Pediatrics—I-R/IH, II-R/PA, PC-R/PA.
21. Psychiatry—I-R, II-R.
22. Radiology—I-R/PA, II-R/PA, PC-R/PA. A pediatric radiologist shall be promptly available twenty-four (24) hours a day in a level I center (I-R-PA).
23. Rehabilitation—I-R, II-R,
24. Child Protection/Forensic Medicine- I-R
25. Anesthesiology—I-R/IH, II-R/IA, PC-R/PA.

A board-certified or board-admissible anesthesiologist credentialed in pediatric care shall be available in-house twenty-four (24) hours a day. Senior anesthesiology residents or anesthesiologists not credentialed in pediatric care may fulfill the in-house requirement if the credentialed pediatric anesthesiologist is on call and promptly available.

A. In a level I or II pediatric trauma center, anesthesiology staffing requirements may be fulfilled by anesthesiology residents or certified registered nurse anesthetists (CRNA) capable of assessing emergent situations in trauma patients and of providing any indicated treatment including induction of anesthesia or may be fulfilled by anesthesiologist assistants with anesthesiologist supervision in accordance with sections 334.400 to 334.430, RSMo.

B. In a pediatric capable trauma center, anesthesiology requirements may be fulfilled by a CRNA with physician supervision, or an anesthesiologist assistant with anesthesiology supervision.

Education

(J) Pediatric trauma medical director must accrue a minimum average of 16 hours annually or 48 hours in 3 years of verifiable CME, external CME recommended, of which at least 12 hours (in 3 years) must be related to pediatric trauma care. (I-R, II-R)

(K) Orthopedic surgeons, neurosurgeons, anesthesiologists, and critical care medicine physician liaisons who take trauma call must document acquisition of 8 (eight) hours of CME annually, external recommended, four (4) of which are pediatric related CME. (I-R, II-R, PC-R).

(3) Standards for Special Facilities/Resources/Capabilities for Pediatric Trauma Center Designation.

(A) The hospital shall meet emergency department standards for trauma center designation. There shall be a designated trauma resuscitation area in the emergency department. A level I pediatric trauma center shall have a pediatric emergency department area.

1. The emergency department staffing shall ensure immediate and appropriate care of the trauma patient. (I-R, II-R, PC-R)

2. The physician director of the emergency department in a Level I Pediatric Trauma Center shall be board-certified or board admissible in Pediatric Emergency Medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada (I-R).

a. The pediatric emergency department physician providing pediatric trauma care shall be a board-certified or board or board-admissible pediatrician credentialed in emergency care and shall be available in the emergency department twenty-four (24) hours a day.

1. This requirement may be fulfilled by a physician who is board-certified or board-admissible in emergency medicine who demonstrates commitment by engaging in the exclusive practice of pediatric emergency medicine a minimum of one hundred (100) hours per month or who has an additional year of training in pediatric emergency medicine or who is board certified or admissible in pediatric emergency medicine.

2. This requirement may also be fulfilled by non-pediatric trained providers with sufficient training and experience in pediatric trauma care and knowledgeable about current emergency department management of pediatric trauma. (GB p. 58)

a. The center shall make specialty-specific pediatric education available for these providers and document annual updates by pediatric specialists to the non-pediatric-trained providers.

3. The physician director of the emergency department shall be board-certified or board-admissible in emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada (II-R).

a. The pediatric emergency department physician providing pediatric trauma care shall be a board-certified or board or board-admissible pediatrician credentialed in emergency care shall be available in the emergency department twenty-four (24) hours a day.

1. This requirement may be fulfilled by a physician who is board-certified or board-admissible in emergency medicine who demonstrates commitment by engaging in the exclusive practice of pediatric emergency medicine a minimum of one hundred (100) hours per month or who has an additional year of training in pediatric emergency medicine or who is board certified or admissible in pediatric emergency medicine.

2. This requirement may also be fulfilled by non-pediatric trained providers with sufficient training and experience in pediatric trauma care and knowledgeable about current emergency department management of pediatric trauma. (GB p. 58)

a. The center shall make specialty-specific pediatric education available for these providers and document annual updates by pediatric specialists to the non-pediatric-trained providers.

4. There shall be a physician trained in the care of the critically injured as evidenced by credentialing in ATLS and current in trauma CME in the emergency department twenty-four (24) hours a day. ATLS is incorporated by reference in this rule as published by the American College of Surgeons in 2003 and is available at American College of Surgeons, 633 N. St. Clair St., Chicago, IL 60611. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, PC-R)

a. All pediatric emergency department physicians shall be certified in ATLS and PALS at least once prior to the initial review. Physicians who are certified in boards other than emergency medicine by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada who treat pediatric trauma patients in the emergency department are required to have current ATLS and PALS status. (I-R, II-R, PC-R)

b. All pediatric emergency department physicians providing pediatric trauma care shall document a minimum average of eight (8) hours of CME, external CME recommended, in trauma care every year, four (4) hours of which should be in pediatric trauma care. (I-R, II-R, PC-R)

5. There shall be written protocols defining the relationship of the emergency department physicians to other physician members of the trauma team. (I-R, II-R, PC-R)

6. A board-certified or board-admissible pediatrician credentialed in emergency care shall be available to the emergency department twenty-four (24) hours a day. (I-R, II-R, PC-R)

7. All registered nurses assigned to the emergency department shall be credentialed in trauma nursing by the hospital within one (1) year of assignment. (I-R, II-R, PC-R)

(a) Registered nurses credentialed in trauma nursing shall document a minimum of eight (8) hours of trauma-related continuing nursing education per year, 4 of which shall be in pediatric trauma care. (I-R, II-R, PC-R)

(b) Registered nurses credentialed in trauma care shall obtain current provider status in the Trauma Nurse Core Curriculum or Advanced Trauma Care for Nurses and either Pediatric Advanced Life Support (PALS), Advanced Pediatric Life Support (APLS), or Emergency Nursing Pediatric Course (ENPC) within one (1) year of employment in the emergency department and maintain thereafter. The requirement for Pediatric Advanced Life Support, Advanced Pediatric Life Support, or Emergency Nursing Pediatric Course may be waived in centers where policy exists diverting injured children to a pediatric trauma center and where a pediatric trauma center is adjacent and a performance improvement filter reviewing any children seen is maintained. The Trauma Nurse Core Curriculum is incorporated by reference in this rule as published in 2007 by the Emergency Nurses Association and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. Advanced Trauma Care for Nurses is incorporated by reference in this rule as published in 2003 by the Society of Trauma Nurses and is

available at the Society of Trauma Nurses, 1926 Waukegan Road, Suite 100, Glenview, IL 60025. This rule does not incorporate any subsequent amendments or additions. Pediatric Advanced Life Support is incorporated by reference in this rule as published in 2005 by the American Heart Association and is available at the American Heart Association, 7272 Greenville Avenue, Dallas, TX 75231. This rule does not incorporate any subsequent amendments or additions. The Emergency Nursing Pediatric Course is incorporated by reference in this rule as published by the Emergency Nurses Association in 2004 and is available at the Emergency Nurses Association, 915 Lee Street, Des Plaines, IL 60016-9659. This rule does not incorporate any subsequent amendments or additions. (I-R, II-R, PC-R)

8. There shall be a minimum of two (2) registered nurses per shift specializing in pediatric trauma care assigned to the emergency department. (I-R, II-R, PC-R)

9. Respiratory therapy technicians who work with pediatric trauma patients in the emergency department shall be experienced in pediatric respiratory therapy techniques. (I-R, II-R, PC-R)

10. There shall be a designated trauma resuscitation area in the emergency department equipped for pediatric patients. Equipment to be immediately accessible for resuscitation and to provide life support for the seriously injured pediatric patient shall include, but not be limited to:

A. Airway control and ventilation equipment for all size patients, including laryngoscopes, assorted blades, airways, endotracheal tubes and bag-mask resuscitator, and mechanical ventilators; (I-R, II-R, PC-R)

B. Oxygen, air and suction devices; (I-R, II-R, PC-R)

C. Electrocardiograph, monitor and defibrillator to include internal pediatric paddles at level I and II centers; (I-R, II-R, PC-R)

D. Apparatus to establish central venous pressure monitoring and arterial monitoring; (I-R, II-R)

E. All standard intravenous fluids and administration devices, including intravenous and intraosseous catheters designed for delivering IV fluids and medications at rates and in amounts appropriate for pediatric patients; (I-R, II-R, PC-R)

F. Sterile surgical sets for standard procedures for the emergency department; (I-R, II-R, PC-R)

G. Gastric lavage equipment; (I-R, II-R, PC-R)

H. Drugs and supplies necessary for emergency care, including length-weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight; (I-R, II-R, PC-R)

I. Two-way radio linked with EMS vehicles; (I-R, II-R, PC-R)

J. End-tidal carbon dioxide monitor; (I-R, II-R, PC-R)

J. Rapid infusion system for parenteral fluids; (I-R, II-R, PC-R)

J. Equipment for spinal stabilization for all age groups; (I-R, II-R, PC-R)

K. Temperature control devices for patients, parenteral fluids and blood; (I-R, II-R, PC-R)

L. Blood pressure cuffs, chest tubes, nasogastric tubes and urinary drainage apparatus for the pediatric patient; (I-R, II-R, PC-R) and

M. Patient weighing devices. (I-R, II-R, PC-R)

11. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, IIR, PC-R)

12. There shall be X-ray capability with twenty-four (24)-hour coverage by technicians. (I-IH, II-IH, PC-IA)

13. Nursing documentation for the trauma patient shall be on a trauma flow sheet approved by the trauma medical director and trauma nurse coordinator/trauma program manager. (I-R, II-R, PC-R)

(B) The **pediatric floor** shall have the following personnel and equipment: (I-R, II-R, PC-R)

(1) Trauma patients shall be admitted to a surgical trauma service staffed by credentialed trauma providers. (I-R, II-R, PC-R)

(2) A physician who is not the emergency department or PICU physician shall be on duty or available twenty-four (24) hours a day, seven (7) days a week; (I-R/IH, II-R/IA, PC-R/IA)

(3) Registered nurses and other essential personnel on duty twenty-four (24) hours a day, seven (7) days a week; (I-R, II-R, PC-R)

(4) Registered nurses shall be credentialed as determined by the hospital; (I-R, II-R, PC-R)

(5) There shall be written care protocols for identification and treatment of pediatric trauma patients available to personnel and should be reviewed annually and revised as needed; (I-R, II-R, PC-R)

(6) Equipment for resuscitation and to provide supports for the pediatric trauma patient including, but not limited to: (I-R, II-R, PC-R)

A. Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator and sources of oxygen;

B. Suction devices;

C. Electrocardiograph, cardiac monitor and defibrillator;

D. All standard intravenous fluids and administration devices and intravenous catheters; and

E. Drugs and supplies necessary for pediatric emergency care, including length-weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight;

(7) Documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R, PC-R)

(C) **Radiological capabilities** for pediatric trauma center designation including a mechanism for timely interpretation to aid in patient management shall include:

1. There shall be X-ray capability with twenty-four (24)-hour coverage by in-house technicians (I-R, II-R, PC-R).

2. Angiography, including general, peripheral, and cerebrovascular, with interventional capability available twenty-four (24) hours a day with a one (1)-hour maximum response time from time of notification—(I-R, II-R);

3. Sonography available twenty-four (24) hours a day with a thirty (30)-minute maximum response time—(I-R, PI-R, PC-R);

4. In-house computerized tomography. (I-R, II-R, PC-R);
5. Computerized tomography technician—(I-R/IH, II-R/IA, PC-R/IA).
6. Nuclear Scanning- (I-R/PA)
7. Resuscitation equipment available to the radiology department—(I-R, II-R, PC-R);
8. Adequate physician and nursing personnel shall be present with monitoring equipment to fully support the trauma patient and provide documentation of care during the time that the patient is physically present in the radiology department and during transportation to and from the radiology department. Nurses providing care for the trauma patients that are not accompanied by a trauma nurse while in the radiology department during initial evaluation and resuscitation shall maintain the same credentialing required of emergency department nursing personnel—I-R, II-R, PC-R;
9. Documentation that all equipment is checked according to the hospital preventive maintenance schedule. (I-R, II-R, PC-R)

(D) The hospital shall meet **pediatric intensive care unit** standards for trauma center designation (I-R, II-R).

1. Level I and II pediatric trauma centers shall have a dedicated pediatric intensive care unit. (I-R, II-R)
2. The medical director for the pediatric intensive care unit (PICU) shall be board-certified or board-eligible in pediatric critical care or in pediatric surgery and surgical critical care. (I-R, II-R)
3. A physician (pediatrician or senior pediatric resident) who is not the emergency department physician or the on-call trauma surgeon shall be on duty in the ICU and immediately available or available in-house twenty-four (24) hours a day. This physician shall maintain a current PALS certification. (I-IH, II-IA)
4. The PICU patient shall have nursing care by a registered nurse who is regularly assigned to pediatric intensive care. (I-R, II-R)
5. The PICU shall utilize a patient classification system which defines the severity of injury and indicates the number of registered nurses needed to staff the unit. The minimum registered nurse/trauma patient ratio used shall be one to two (1:2). (I-R, II-R)
6. All registered nurses regularly assigned to the PICU shall document a minimum of eight (8) hours per year of continuing nursing education on care of the pediatric trauma patient. Registered nurses shall be credentialed in trauma care within one (1) year of assignment documenting a minimum of eight (8) hours of trauma-related continuing nursing education per year. (I-R, II-R.) At the time of the initial review, nurses assigned to PICU shall have successfully completed or be registered for a provider PALS and ACLS course. The requirement for ACLS may be waived in pediatric centers where policy exists diverting injured adults to an adult trauma center and where an adult trauma center is adjacent to the affected pediatric facilities, and a performance improvement filter reviewing any adult trauma patients seen is maintained. In pediatric trauma centers that provide care for injured adults, the ICU shall have at least one person certified in ACLS assigned 24 hours a day 7 days a week. (I-R, II-R).
7. Nursing care documentation shall be on a patient flow sheet approved by the trauma medical director and program manager. (I-R, II-R)
8. There shall be beds for trauma patients or comparable level of care provided until space is available in PICU. (I-R, II-R).

9. There shall be immediate access to clinical laboratory services. (I-R, II-R)
10. Equipment for resuscitation and to provide life support for the critically or seriously injured shall be available for the pediatric intensive care unit. This equipment shall include, but not be limited to: (I-R, II-R)
- A. Airway control and ventilation equipment for all size patients including laryngoscopes, assorted blades, endotracheal tubes, bag-mask resuscitator, end tidal carbon dioxide monitor and mechanical ventilator;
 - B. Oxygen source with concentration controls and suction devices;
 - C. Cardiac emergency cart, including medications
 - D. Electrocardiograph, cardiac monitor and defibrillator, including internal and external pediatric paddles;
 - E. Patient weighing devices;
 - F. Electronic pressure monitoring and pulse oximetry
 - G. Apparatus to establish invasive hemodynamic monitoring and pulse oximetry;
 - H. All standard intravenous fluids and administration devices, including intravenous catheters designed for delivering IV fluids and medications at rates and in amounts appropriate for pediatric patients;
 - I. Gastric lavage equipment;
 - J. Drugs and supplies necessary for emergency care, including length-weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight;
 - K. Temporary transvenous pacemaker;
 - L. Pulmonary function measuring devices;
 - M. Temperature control devices for the patient, parenteral fluids and blood;
 - N. Intracranial pressure monitoring devices;
 - O. Appropriate emergency surgical trays; and
 - P. Blood pressure cuffs, chest tubes, nasogastric tubes and urinary drainage apparatus for the pediatric patient.
12. There shall be documentation that all equipment is checked according to the hospital preventive maintenance schedule.

(E) The hospital shall meet post-anesthesia recovery room (PAR) standards for pediatric trauma center designation. Unless the hospital uses PICU to recover pediatric trauma patients, the following PAR standards apply:

- 1. The post-anesthesia recovery room shall be staffed with registered nurses regularly assigned to pediatric care and other essential personnel on call and available twenty-four (24) hours a day; registered nurses and other essential personnel who are not on duty shall be on call and available within sixty (60) minutes. (I-R, II-R, PC-R) and
- 2. Equipment to be accessible for resuscitation and to provide life support for the critically or seriously injured pediatric patient shall include, but not be limited to:
 - A. Airway control and ventilation equipment for all size patients including laryngoscopes, assorted blades, airways, endotracheal tubes, bag-mask resuscitator, and mechanical ventilator; (I-R, II-R, PC-R)
 - B. Oxygen, end-tidal carbon dioxide monitor, and suction devices; (I-R, II-R, PC-R)
 - C. Electrocardiograph, cardiac monitor and defibrillator at level I, II, and PC centers, including internal pediatric paddles at level I and II centers;

- D. Apparatus to establish and maintain hemodynamic monitoring at level I, II, and PC centers, including central venous pressure monitoring;
- E. All standard intravenous fluids and administration devices, including intravenous and intraosseous catheters designed for delivering IV fluids and medications at rates and in amounts appropriate for pediatric patients; (I-R, II-R, PC-R)
- F. Sterile surgical sets for emergency procedures; (I-R, II-R PC-R)
- G. Drugs and supplies necessary for emergency care, including length-weight based tape or appropriate reference material for pediatric equipment sizing and drug dosing based on estimated or known weight; (I-R, II-R, PC-R)
- H. Temperature control devices for the patient, parenteral fluids and blood; (I-R, II-R, PC-R)
- I. Temporary transvenous pacemaker; (I-R, II-R)
- J. Electronic pressure monitoring; (I-R, II-R) and
- K. Pulmonary function measuring devices—I-R, II-R.

(F) The **operating room** personnel, equipment, and procedures of a trauma center shall include, but not be limited to (I-R, II-R, PC-R)

1. Adequately staffed and available twenty- four (24) hours a day with a back-up operating room staff on call and promptly available. (I-R-IH, II-R-PA, PC-R-PA)
 2. Equipment for resuscitation and to provide life support for the critically or seriously injured pediatric patient shall include, but not be limited to:
 3. Operating microscope (I-R, II-R);
 4. Thermal control equipment for patient, parenteral fluids and blood (I-R, II-R, PC-R);
 5. Endoscopic capabilities, all varieties (I-R, II-R);
 6. Instruments necessary to perform an open craniotomy (I-R, II-R);
 7. Invasive and noninvasive hemodynamic monitoring equipment (I-R, II-R, PC-R);
 8. Pediatric anesthesia equipment (I-R, II-R);
 9. Defibrillator and monitor at level I, II and PC, including internal pediatric paddles at level I and II; and
 10. Blood pressure cuffs, chest tubes, nasogastric tubes and urinary drainage apparatus for the pediatric patient (I-R, II-R, PC-R);
 11. X-ray capability (I-R, II-R, PC-R)
 12. ICP Monitoring equipment (I-R, II-R)
 13. Intraosseus catheters designed for delivering IV fluids and medications at rates and in amounts appropriate for pediatric patients (I-R, II-R, PC-R)
3. Documentation that all equipment is checked according to the hospital preventive maintenance schedule—I-R, II-R, PC-R.

(G) **Clinical laboratory** services shall be available twenty-four (24) hours a day. There shall be a comprehensive blood bank and access to a community central blood bank and adequate hospital storage facilities. There shall be provisions to provide and receive the following laboratory test results twenty-four (24) hours a day: (I-R, II-R, PC-R)

1. Microbiology;
2. Standard analyses of blood, urine and other body fluids;
3. Blood typing and cross-matching;
4. Coagulation studies;

- 5. Blood gases and pH determinations;
- 6. Serum and urine osmolality; and
- 7. Drug and alcohol screening.
- 9. A written protocol for prioritization of the trauma patient with other time critical patients —I-R, II-R, PC-R.

(H) The pediatric trauma center shall have acute hemodialysis capability or a written transfer agreement. (I-R, II-R, PC-R)

(I) The pediatric trauma center shall have a physician-directed, organized burn care unit or a written transfer agreement. (I-R, II-R, PC-R)

(J) The pediatric trauma center shall have OB-GYN capability or a written transfer agreement for the pregnant pediatric trauma patient. (PC-R)

(K) There shall be documentation of adequate support services including social work in assisting the patient's family from the time of entry into the facility to the time of discharge. (I-R, II-R, PC-R)

(L) Level I pediatric trauma centers shall provide child life services for pediatric trauma patients and their families (I-R)

(M) Hospital diversion information must be maintained to include date, length of time, and reason for diversion. This must be monitored as a part of the Performance Improvement and Patient Safety program, and available when the hospital is site reviewed. (I-R, II-R, PC-R)

(N) Each trauma center shall have a disaster plan. A copy of this disaster plan must be maintained within the trauma center policies and procedures and should document the trauma services role in planning and response. (I-R, II-R, PC-R)

(4) Standards for Programs in Performance Improvement and Patient Safety, Outreach, Public Education and Training for Pediatric Trauma Center Designation.

(A) There shall be an ongoing pediatric trauma performance improvement and patient safety program (PIPS) designed to objectively and systematically monitor, review, and evaluate the quality and appropriateness of patient care, pursue opportunities to improve patient care, and resolve identified problems. (I-R, II-R, PC-R).

(B) The following additional performance improvement and patient safety measures shall be required:

1. Regular reviews of all trauma-related deaths; There shall be a mechanism in place to review all deaths and identify primary admitted patients versus transferred patients. Transferred patients shall be further identified as transferred after stabilizing treatment or direct admission after prolonged treatment. —I-R, II-R, PC-R;
2. A regular morbidity and mortality review, at least quarterly—I-R, II-R, PC-R;

3. A regular multidisciplinary trauma conference that includes representation of all members of the trauma team, with minutes of the conferences to include attendance, individual cases reviewed and findings—I-R, II-R, PC-R;
 4. The receiving hospital shall provide, monitor and document bidirectional timely feedback to and from the EMS providers and referring hospital, if involved. This feedback shall include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within seventy-two (72) hours of admission or arrival of the trauma patient at the hospital if not admitted. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame does not apply.—I-R, II-R, PC-R
 4. Regular reviews of the reports generated by the Department of Health and Senior Services from the Missouri trauma registry and the head and spinal cord injury registry—I-R, II-R, PC-R;
 5. Regular reviews of pre-hospital trauma care including inter-facility transfers and all adult patients seen in pediatric centers—IR, II-R, PC-R;
 6. Participation in reviews of regional systems of trauma care as established by the Department of Health and Senior Services—I-R, II-R, PC-R; and
 7. Trauma patients remaining greater than sixty (60) minutes prior to transfer will be reviewed as a part of the performance improvement and patient safety program—I-R, II-R, PC-R
 8. Pediatric trauma centers receiving patients from non-pediatric trauma centers and non-trauma hospitals shall review all pediatric transfers requiring admission that had a length of stay greater than 60 minutes. (I-R, II-R)
- (C) There shall be an outreach program that provides twenty-four (24)-hour availability of telephone consultation with physicians in the outlying areas. (I-R, II-R)
- (D) The hospital shall demonstrate leadership in injury prevention in infants and children. A public education program shall be established to promote injury prevention and trauma care and to resolve problems confronting the public, medical profession, and hospitals regarding optimal care for the injured. These must address major trauma issues as identified in that program's performance improvement and patient safety process. (I-R, II-R, PC-R)
- (E) The hospital and its staff shall document a research program in pediatric trauma (I-R).
- (F) There shall be formal continuing education programs in pediatric trauma and rehabilitation provided by the hospital for staff physicians and nurses. (I-R, II-R, PC-R)
- (G) The hospital shall provide programs in continuing education for the area physicians, registered nurses and emergency medical service providers concerning the treatment of the pediatric trauma patient. (I-R, II-R)
- (H) The hospital shall be actively involved in local and regional emergency medical services systems by providing training and clinical resources. (I-R, II-R, PC-R)

(I) There shall be a hospital-approved procedure for credentialing nurses in trauma care. (I-R, II-R, PC-R)

1. All nurses providing care to severely injured patients and assigned to the emergency department shall complete the minimum trauma nursing courses described in section 3A7b to become credentialed in trauma care within one (1) year of assignment and maintain 8 (eight) hours trauma continuing education per year thereafter. (I-R, II-R, PC-R-)

2. The content and format of any trauma nursing courses developed and offered by a hospital in place of the courses listed in section 3A7b shall be developed in cooperation with the trauma medical director. This course must provide 16 (sixteen) hours of CEU's from an accrediting body recognized by a national accrediting organization. A copy of the course curriculum used shall be filed with the department. (I-R, II-R, PC-R)

3. Trauma nursing courses offered by level I and II centers or courses such as the Advanced Trauma Care for Nurses, Emergency Nursing Pediatric Course, or the Trauma Nurse Core Curriculum may be used to fulfill this requirement. To receive credit for this course, a nurse shall obtain advance approval for the course from the trauma medical director and trauma nurse coordinator/trauma program manager and shall present evidence of satisfactory completion of the course. (I-R, II-R, PC-R)

(5) Standards for the Programs in Trauma Rehabilitation for Pediatric Trauma Center Designation.

(A) The pediatric trauma center shall have injury rehabilitation and spinal cord injury management and rehabilitation capability or a written transfer agreement with a rehabilitation center which is specifically equipped for the care of children. (I-R, II-R, PC-R)

(B) The hospital shall have a written transfer agreement with a rehabilitation center which is specifically equipped for the care of children. (PC-R)

(C) The pediatric trauma rehabilitation team shall develop and implement a procedure for discharge planning for the pediatric trauma patient. (I-R, II-R)

(D) The pediatric trauma rehabilitation plan developed for the pediatric trauma patient shall be under the direction of a physiatrist or a physician with experience in pediatric trauma rehabilitation. (I-R, II-R)

(E) The hospital shall develop a plan to document that there is adequate post-discharge follow-up on pediatric trauma patients, including rehabilitation results where applicable. This shall include identification of members of the rehabilitation team where applicable, discharge summary of trauma care to the patient's private physician and documentation in the patient's medical record of the post-discharge plan. (I-R, II-R, PC-R)

(6) Standards for the Programs in Trauma Research for Trauma Center Designation.

(A) The hospital and its staff shall support a research program in trauma as evidenced by any of the following: 1. Publications in peer reviewed journals—I-R;
2. Reports of findings presented at regional or national meetings—I-R;
3. Receipt of grants for study of trauma care—I-R; and
4. Production of evidence-based reviews—I-R.

(B) The hospital shall agree to cooperate and participate with the EMS Bureau in conducting epidemiological studies and individual case studies for the purpose of developing injury control and prevention programs. I-R, II-R, PC-R,

*AUTHORITY: sections 190.185 and 190.241, RSMo Supp. 1998. * Emergency rule filed Aug. 28, 1998, effective Sept. 7, 1998, expired March 5, 1999. Original rule filed Sept. 1, 1998, effective Feb. 28, 1999. *Original authority: 190.185, RSMo 1973, amended 1989, 1993, 1995, 1998 and 190.241, RSMo 1987, amended 1998.*

DRAFT

Title 19 - DEPARTMENT OF HEALTH AND SENIOR SERVICES
Division 30 - Division of Regulation and Licensure
Chapter 40 – Comprehensive Emergency Medical Services Systems Regulations

PROPOSED AMENDMENT
April 21, 2011 TTF Meeting DRAFT

19 CSR 30-40.410 Trauma Center Definitions. The department is amending section (1).

PURPOSE: This amendment defines Level IV trauma centers.

(1) The following definitions and abbreviations shall be used in the interpretation of the rules in 19 CSR 30-40.400 to 19 CSR 30-40.450:

(A) Advanced cardiac life support (ACLS) certified means that an individual has successfully completed a course of training in advanced cardiac life-support techniques certified by the American Heart Association and that certification is maintained;

(B) Anesthesiologist assistant (AA) means a person who meets each of the following conditions:

1. Has graduated from an anesthesiologist assistant program accredited by the American Medical Association's Committee on Allied Health Education and Accreditation or by its successor agency;

2. Has passed the certifying examination administered by the National Commission on Certification of Anesthesiologist Assistants;

3. Has active certification by the National Commission on Certification of Anesthesiologist Assistants;

4. Is currently licensed as an anesthesiologist assistant in the state of Missouri; and

5. Provides health care services delegated by a licensed anesthesiologist. For the purposes of subsection (1)(B), the licensed anesthesiologist shall be "immediately available" as this term is defined in section 334.400, RSMo.

(C) APLS course means advanced pediatric life support;

(D) ATCN course means advanced trauma care for nurse's course;

(E) ATLS course means the advanced trauma life support course approved by the American College of Surgeons when required, certification shall be maintained;

[K] (F) BEMS Bureau means the Missouri Department of Health and Senior Services Bureau of Emergency Medical Services;

(G) Board-admissible means that a physician has applied to a specialty board of the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada and has received a ruling that s/he has fulfilled the requirements to take the examinations. Board certification must be obtained within five (5) years of the first appointment;

(H) Board-certified means that a physician has fulfilled all requirements, has satisfactorily completed the written and oral examinations, and has been awarded a board diploma in a specialty field by the American Board of Medical Specialties, the Bureau of Osteopathic Specialties and Boards of Certification, or the Royal College of Physicians and Surgeons of Canada;

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(I) Certified registered nurse anesthetist (CRNA) means a registered nurse who has graduated from a school of nurse anesthesia accredited by the Council on Accreditation of Educational Programs of Nurse Anesthesia or its predecessor and who has been certified as a nurse anesthetist by the Council on Certification of Nurse Anesthetists;

(J) CME means continuing medical education and refers to the highest level of continuing education approved by the Missouri State Medical Association, the Missouri Association of Osteopathic Physicians and Surgeons, The American Osteopathic Association, or the Accreditation Council for Continuing Medical Education;

(K) Continuing nursing education means education approved or recognized by a national and/or state professional organization and/or trauma medical director;

(L) Credentialed or credentialing is a hospital-specific system of documenting and recognizing the qualifications of medical staff and nurses and authorizing the performance of certain procedures and establishing clinical privileges in the hospital setting;

(M) Department is the department of health and senior services in the state of Missouri;

(N) Director is the director of the department of health and senior services or the director's duly authorized representative;

(O) Emergency department trauma call roster is a hospital-specific list of licensed trauma care providers assigned to trauma care, including date(s) of coverage and back-up licensed trauma care providers when indicated;

(P) ENPC course means emergency nursing pediatric course;

[L] (Q) Glasgow coma scale is a scoring system for assessing a patient's level of consciousness utilizing a point system which measures eye opening, verbal response, and motor response. The higher the total score, the better the patient's neurological status;

(R) Hospital is an establishment as defined in the hospital licensing law, subsection 2 of section 197.030, RSMo, or a hospital operated by the state;

[M] (S) Immediately available (IA) means being present at bedside at the time of the patient's arrival at the hospital when prior notification is possible and no more than twenty (20) minutes from the hospital under normal driving and weather conditions;

[N] (T) In-house (IH) means being on the hospital premises twenty-four (24) hours a day;

[O] (U) Liaison means one (1) physician representative from each of the following areas: Emergency Medicine, Neurosurgery, Orthopedics, and Anesthesia who is selected to attend the Performance Improvement and Patient Safety Committee and to disseminate information to the other physicians within his/her specialty taking trauma call;

[P] (V) Missouri trauma registry is a statewide data collection system to compile and maintain statistics on mortality and morbidity of trauma victims, using a reporting method provided by the Missouri Department of Health and Senior Services;

[Q] (W) Multidisciplinary trauma conference means a meeting of members of the trauma team and other appropriate hospital personnel to review the care of trauma patients at the hospital;

[S] (X) PALS means Pediatric Advanced Life Support, ENPC means Emergency Nurses Pediatric Course, and APLS means Advanced Pediatrics Life Support; when required, certification shall be maintained;

(Y) Patient is an individual who is sick, injured, wounded, diseased, or otherwise incapacitated or helpless, or dead, excluding deceased individuals being transported

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from or between private or public institutions, homes or cemeteries, and individuals declared dead prior to the time an ambulance is called for assistance;

(Z) Pediatric Trauma Center is a children's hospital, which may be a freestanding children's hospital or a separate administrative entity within a larger general hospital organization, such as a children's hospital within a hospital or a full service general hospital with comprehensive pediatric inpatient subspecialty services similar to those found in a freestanding children's hospital or a children's hospital within a hospital Adult Hospitals that pursue verification as pediatric trauma centers must meet the same resource requirements as adult trauma centers, in addition to pediatric resource requirements. A pediatric trauma center should have sufficient volume of institutional experience with major pediatric injuries to maintain the clinical skills of pediatric trauma team members.

1. A level I pediatric trauma center must annually admit 200 or more injured children younger than 15 years.

2. A level II pediatric trauma center must annually admit 100 or more injured children younger than 15 years.

3. A pediatric capable center is a current adult trauma center that admits injured children younger than 15 year or a non-designated center that is seeking adult trauma center designation concurrently with pediatric trauma center designation. The pediatric capable trauma center shall evaluate and transfer as appropriate to higher level trauma center according to department or department approved community or regional plan. The pediatric capable trauma center shall assess, treat, and release or observe all other injured patients as appropriate

(AA) Physician is a person licensed as a physician pursuant to chapter 334, RSMo;

[T] **(BB)** Physician advisory group is two (2) or more physicians who collectively assume the role of a medical advisor;

[U] **(CC)** Promptly available (PA) means arrival at the patient's bedside within thirty (30) minutes after notification of *[a patient's arrival at the hospital under normal driving and weather conditions]* **the patient;**

(DD) Protocol is a predetermined, written medical care guideline, which may include standing orders;

(EE) Qualified individual is a trauma care provider who demonstrates administrative ability and shows evidence of educational preparation and clinical experience in the care of injured patients.

[V] **(FF)** R is a symbol to indicate that a standard is a requirement for trauma center designation at a particular level;

[W] **(GG)** Review is the inspection of hospitals to determine compliance with the rules of this chapter. There are four (4) types of reviews: the initial review of hospitals never before designated as trauma centers or hospitals never before reviewed for compliance with the rules of this chapter or hospitals applying for a new level of trauma center designation; the verification review to evaluate the correction of any deficiencies noted in a previous review; and the validation review, which shall occur every five (5) years to assure continued compliance with the rules of this chapter, and a focus review to allow review of substantial deficiencies by a review team;

[X] **(HH)** Revised trauma score (RTS) is a numerical methodology for categorizing the physiological status of trauma patients;

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(II) Rural places is defined by the U.S. Census Bureau as any incorporated place or census designated place with fewer than 2,500 inhabitants that is located outside of an urbanized area.

[Y] **(JJ)** Senior trauma surgery resident is a physician in at least the third post-graduate year of study;

[Z] **(KK)** Severely injured adult patient is an injured patient with a glasgow coma score (GCS) less than fourteen (14) or a systolic blood pressure less than ninety (90) millimeters of mercury or respirations less than ten (10) per minute or more than twenty-nine (29) per minute;

[AA] **(LL)** Severely injured child is defined as a patient fourteen (14) years of age or less having a GCS less than fourteen (14), shock following injury, pediatric trauma score less than eight (8), or with any of the following conditions: unable to establish or maintain an airway; ineffective respiratory effort; penetrating injury to head, neck, chest, abdomen, or extremity proximal to elbow or knee; burns greater than ten percent (10%) of the body surface area or involving inhalation injury; two (2) or more proximal long bone fractures or pelvic fracture; open or depressed skull fracture; suspected spinal cord injury and/or paralysis; amputation proximal to wrist or ankle; facial or tracheal injury with airway compromise; pre-existing medical conditions; or respiratory or cardiopulmonary arrest after injury;

[BB] **(MM)** Surgical trauma call roster is a hospital-specific list of surgeons **in Level I, II and III trauma centers** assigned to trauma care, including date(s) of coverage and back-up surgeons when indicated;

[CC] **(NN)** **Trauma care providers are physicians, registered nurses, nurse practitioners or physician assistants who have been credentialed by the hospital to provide trauma care and shall be able to establish and manage an airway and respiratory and circulatory compromise.**

(OO) Trauma center is a hospital that has been designated in accordance with the rules in this chapter to provide systematized medical and nursing care to trauma patients. Level I is a receiving center staffed and equipped to provide total care for every aspect of trauma care, including care for those patients with complications, it functions as a resource center for the hospitals within that region, and conducts research. Level II is a receiving center staffed and equipped to provide care for a large number of trauma patients within the region; Level III centers provide prompt assessment, indicated resuscitation and appropriate emergency intervention for trauma patients to stabilize and arrange timely transfer to a higher level trauma center, as needed. Level IV is a referral center in an area considered rural or where there are insufficient hospital resources to serve the patient population requiring trauma care. The Level IV center provides prompt assessment, indicated resuscitation, appropriate emergency intervention, and arranges and expedites transfer to a higher level trauma center as needed in accordance with state and/or approved local regional plan.

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[DD](PP) Trauma medical director is a board certified or eligible surgeon designated by the hospital **in Level I, II and III trauma centers**, who is responsible for the trauma service and performance improvement and patient safety programs related to trauma care. **In a Level IV trauma center, the trauma medical director is a board certified or eligible physician designated by the hospital who is responsible for the trauma service and performance improvement and patient safety programs related to trauma care**; In a Level I and II pediatric trauma center, the trauma medical director is a board-certified or board eligible pediatric surgeon **designated by the hospital who is responsible for the trauma service and performance improvement and patient safety programs related to trauma care**; and In a Pediatric Capable trauma center, the trauma medical director is a board-certified or board eligible general surgeon **designated by the hospital who is responsible for the trauma service and performance improvement and patient safety programs related to trauma care**

[EE] (QQ) Trauma nurse coordinator/trauma program manager is a registered nurse or other qualified individual designated by the hospital with responsibility for monitoring and evaluating the care of trauma patients and the coordination of performance improvement and patient safety programs for the trauma center in conjunction with the trauma medical director;

TNCC course means

[FF] (RR) Trauma nursing course is an education program in nursing care of trauma patients;

(SS) Trauma patient is a person who has acquired injuries and/or wounds brought on by either an outside force or an outside energy.

[GG] (TT) Trauma service is an organizational component of the hospital specializing in the care of injured patients;

(TT) Urbanized area is a densely settled territory included in an urbanized area or urban cluster as defined by the US Census Bureau.

[HH] (UU) Trauma team **in Level I, II and III trauma centers** is a team consisting of the emergency physician, physicians on the surgical trauma call roster, appropriate anesthesiology staff, nursing and other support staff as needed. **In a Level IV trauma center, the trauma team is a team consisting of the emergency physician, licensed trauma care providers on the emergency trauma call roster, nursing and other support staff as needed**;

[II] (VV) Trauma team activation protocol is a hospital document outlining the criteria used to identify severely injured patients and the procedures for notification of trauma team members and indicating surgical and non-surgical specialty response times acceptable for treating major trauma patients; and

[JJ] (WW) Trauma triage is an estimation of injury severity at the scene of an accident.

AUTHORITY: section 190.185, RSMo Supp. 200[7]8 and section 190.241, HB 1790, 94th General Assembly, Second Regular Session, 2008. Emergency rule filed Aug. 28, 1998, effective Sept. 7, 1998, expired March 5, 1999. Original rule filed Sept. 1, 1998, effective Feb. 28, 1999. Amended: Filed Jan. 16, 2007, effective Aug. 30, 2007. Amended: Filed May 19, 2008, effective Jan. 30, 2009.*

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**Original authority: 190.185, RSMo 1973, amended 1989, 1993, 1995, 1998, 2002 and 190.241, RSMo 1987, amended 1998, 2008.*

PUBLIC COST: This proposed amendment will not cost state agencies or political subdivisions more than five hundred dollars (\$500) in the aggregate.

PRIVATE COST: This proposed amendment will not cost private entities more than five hundred dollars (\$500) in the aggregate.

*NOTICE TO SUBMIT COMMENTS: Anyone may file a statement in support of or in opposition to this proposed with Teresa Generous, Director, Department of Health and Senior Services, Division of Regulation and Licensure, PO Box 570, Jefferson City, MO 65102. To be considered, comments must be received within thirty (30) days after publication of this notice in the **Missouri Register**. No public hearing is scheduled.*

DRAFT

Section 2:

Transport Protocols

Proposed Missouri Adult Trauma Field Triage and Transport Protocol (Trauma Task Force FINAL DRAFT)

Step One

Step One: Assess life threatening conditions
 Unmanageable Airway or Respiratory Compromise or Impending Arrest

Transport to **the closest trauma center or hospital emergency department capable of managing the condition**

Step Two and Step Three

Step Two: Assess Level of Consciousness and Vital Signs

- GCS < 14
- Systolic Blood Pressure < 90
 - **And/ Or Clinical Signs of Shock**
- Respiratory Rate < 10 or > 29

Transport to level I or II trauma center according to local and regional plan via ground and/or air. Special circumstances may exist that necessitate transport to a level III trauma center or closest appropriate ED relative to patient condition. Continue to reassess patient; loop back through protocol and follow according to patient condition.

Step Three: Assess Anatomy of Injury

- All penetrating injuries to head, neck, torso, and extremities (boxer short and T-shirt areas) proximal to elbow and knee
- Flail chest, airway compromise or obstruction, hemo- or pneumothorax, or patients intubated on scene
- Two or more proximal long-bone fractures
- Extremity trauma with loss of distal pulse
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fractures
- Paralysis or signs of spinal cord or cranial nerve injury
- Uncontrolled hemorrhage
- Severe Burns with associated trauma: triage to trauma center according to field triage protocol
- ISOLATED Severe Burns: triage to burn facility

Step Four

Step Four: Assess Biomechanics of Injury and Evidence of High-Energy Impact

- High-risk auto crash
 - Intrusion, including roof: > 12 in occupant site; > 18 inches in any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with high risk of injury
- Pedestrian, Cycle, ATV Crash
 - Auto v. Pedestrian/bicyclist thrown, run over, or with significant impact, ≥ 20 mph
 - Motorcycle or ATV crash ≥ 20 mph [with separation of rider or rollover]
- Falls: ADULTS ≥ 20 ft (one story = 10 ft.)
- Crushed, degloved or mangled extremity
- All open fractures
- Femur fracture with evidence of high energy impact
- Trauma with prolonged Loss of Consciousness
- Pregnancy with acute abdominal pain and traumatic mechanism

Transport to Level I, II, or III trauma center according to local and regional plan via ground and/or air.

- Special circumstances may exist that necessitate transport to another appropriate center relative to patient condition.
- Continue to reassess patient; loop back through protocol and follow according to patient condition

Step Five

Step Five: Assess other risk factors/special patient or system considerations

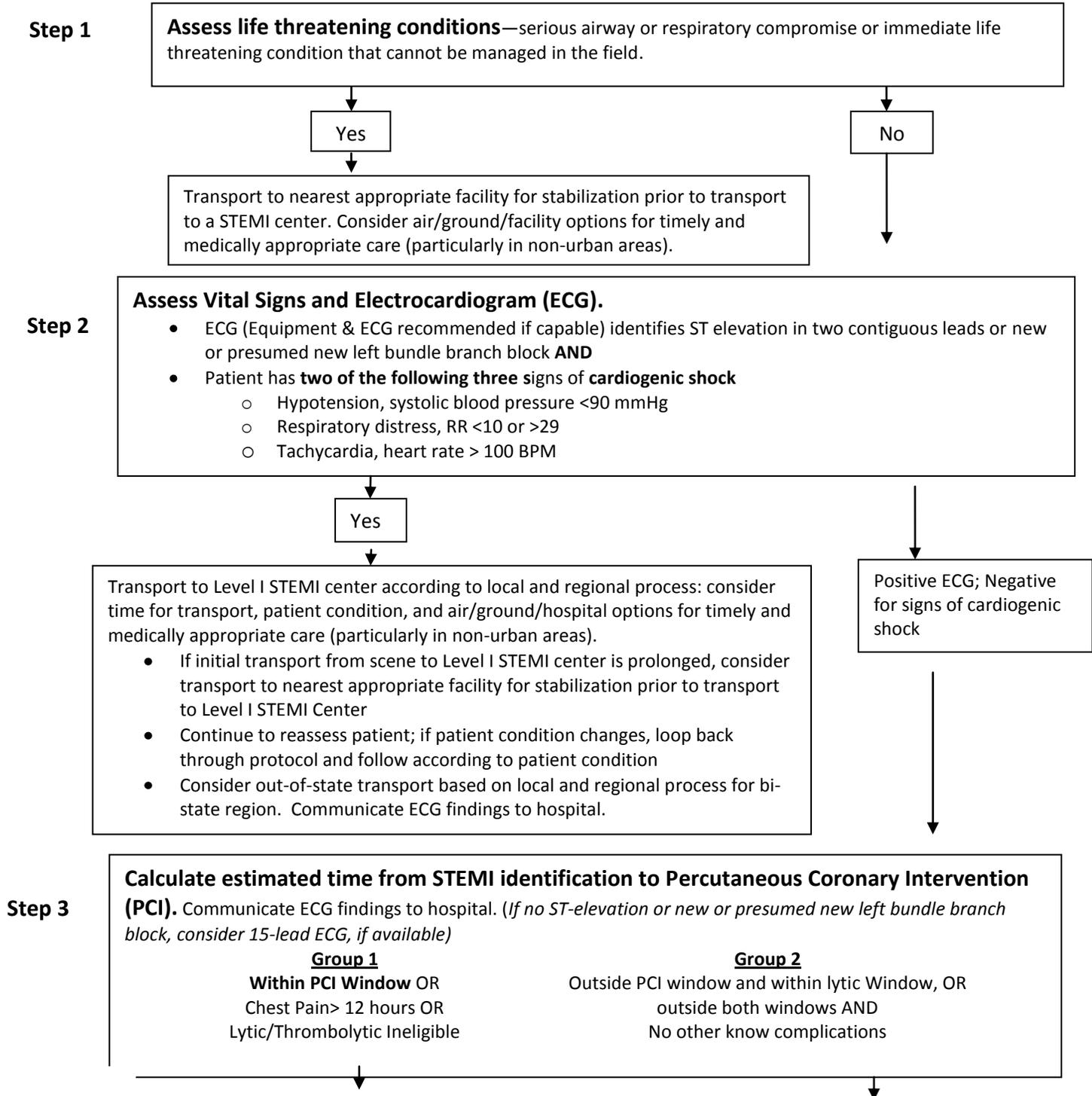
- Age—OLDER ADULTS: > age 55
- Falls: 5-20 Feet
- Lower-risk Crash
- Medical Co-Morbidity
 - Anticoagulation and bleeding disorder
 - All pregnant patients involved in traumatic event
- Less Severe Burns
- Amputation distal to wrist or ankle of two or more digits
- Near drowning/ Near hanging
- EMS provider judgment

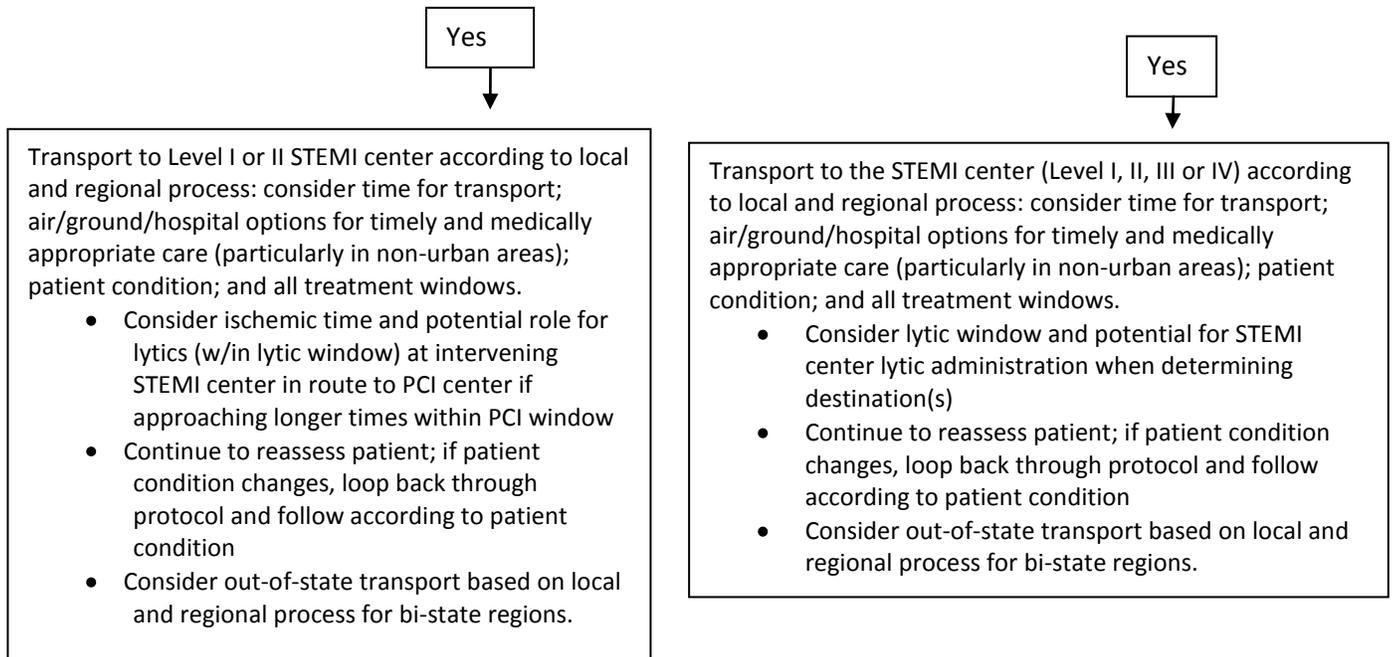
Transport to trauma center level I-IV or a specific resource hospital according to local and regional plan. Continue to reassess patient; loop back through protocol and follow according to patient condition

Transport according to local or regional protocol

(2) All ground and air ambulances shall use the following state transport protocol for suspected STEMI patients except in those circumstances listed in sections (3), (4) and (5) of this algorithm:

STEMI TRANSPORT PROTOCOL





- (3) When initial transport from the scene of illness or injury to a STEMI or stroke center would be prolonged, the STEMI or stroke patient may be transported to the nearest appropriate facility for stabilization prior to transport to a STEMI or stroke center.
- (4) Nothing in this rule shall restrict an individual patient's right to refuse transport to a recommended destination. All ground and air ambulances shall have a written process in place to address patient competency and refusal of transport to the recommended destination.
- (5) Ground and air ambulances are not required to use the state transport protocols when the ambulance is using a community-based or regional plan that has been approved by the department pursuant to section 190.200.3, RSMo that waives the requirements of 19 CSR 30-40.790. Copies of flow charts of this algorithm depicting the stroke and STEMI state transport protocols are available at the Health Standards and Licensure (HSL) office, online at the department's website www.health.mo.gov or may be obtained by mailing a written request to the Missouri Department of Health and Senior Services, HSL, PO Box 570, Jefferson City, MO 65102-0570 or by calling (573) 751-6400.

Title 19—DEPARTMENT OF HEALTH AND SENIOR SERVICES
Division 30- Division of Regulation and Licensure
Chapter 40-Comprehensive Emergency Medical Services Systems Regulations

PROPOSED RULE

19 CSR 30-40.790 Transport Protocol for Stroke and ST Segment Elevation Myocardial Infarction (STEMI) Patients.

PURPOSE: This rule establishes protocols for transporting suspected STEMI patients by severity and time of onset to the STEMI center where resources exist to provide appropriate care, and suspected stroke patients by severity and time of onset to the stroke center where resources exist to provide appropriate care.

- (1) All ground and air ambulances shall use the following state transport protocol for suspected stroke patients except in those circumstances listed in sections (3), (4) and (5) of this rule:
- (A) Step 1-Assess for life threatening conditions (serious airway or respiratory compromise or immediate life threatening conditions that cannot be managed in the field).
 1. If there are life threatening conditions, transport the patient to the nearest appropriate facility for stabilization prior to transport to a stroke center. Consider air/ground/facility options for timely and medically appropriate care (particularly in non-urban areas).
 2. If there are no life threatening conditions, go to step 2 below in (B).
 - (B) Step 2- Assess the duration of onset of symptoms (time last known well).
 1. Group 1- If the patient is within the lytic/therapeutic window then transport to a Level I, II or III stroke center according to local and regional process. Consider the time for transport, the patient's condition, air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas), and the treatment windows. Continue to reassess the patient. If the patient's condition changes then start back with (A) and follow the state stroke protocol outlined in (1) starting from (1)(A) and on according to the patient's condition. Consider out-of-state transport based on local and regional process for bi-state regions.
 2. Group 2- If the patient is within the potential therapeutic window then transport to a Level I stroke center or transport to a Level I, II, or III stroke center according to local and regional process. Consider the time for transport, the patient's condition, air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas), and the

- treatment windows. Continue to reassess the patient. If the patient's condition changes then start back with (A) and follow the state stroke protocol outlined in (1) starting from (1)(A) and on according to the patient's condition. Consider out-of-state transport based on local and regional process for bi-state regions.
3. Group 3- If the patient is out of the lytic/therapeutic and potential therapeutic windows then transport to a Level I, II, III or IV stroke center according to local and regional process. Consider the time for transport, the patient's condition, air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas), and the treatment windows. Continue to reassess the patient. If the patient's condition changes then start back with (A) and follow the state stroke protocol outlined in (1) starting from (1)(A) and on according to the patient's condition. Consider out-of-state transport based on local and regional process for bi-state regions.
- (2) All ground and air ambulances shall use the following state transport protocol for suspected STEMI patients except in those circumstances listed in sections (3), (4) and (5) of this rule:
- (A) Step 1- Assess for life threatening conditions (serious airway or respiratory compromise or immediate life threatening conditions that cannot be managed in the field).
 1. If there are life threatening conditions then transport the patient to the nearest appropriate facility for stabilization prior to transport to a STEMI center. Consider air/ground/facility options for timely and medically appropriate care (particularly in non-urban areas).
 2. If there are no life threatening conditions then go on to step 2 below in (2)(B) and assess vital signs and perform an electrocardiogram (ECG) if the ground or air ambulance has that capability. An electrocardiogram and electrocardiogram equipment are recommended.
 - (B) Step 2- Determine if the patient's vital signs and the electrocardiogram identifies the following:
 1. ST elevation in two (2) contiguous leads or new or presumed new left bundle branch block; and
 2. The patient has two (2) of the following three (3) signs of cardiogenic shock:
 - (A) Hypotension where systolic blood pressure is less than ninety (90) mmHG;
 - (B) Respiratory distress where respirations are less than ten (10) or greater than twenty-nine (29) per minute; or
 - (C) Tachycardia where the heart rate is greater than one hundred (100) beats per minute (BPM).

3. If the patient has an electrocardiogram with ST elevation in two (2) contiguous leads or new or presumed new left bundle branch block AND two (2) of the three (3) signs of cardiogenic shock then transport to a Level I STEMI center according to local and regional process. Consider the time for transport, the patient's condition and the air/ground/hospital options for timely and medical appropriate care (particularly in non-urban areas).
4. If initial transport from the scene to a Level I STEMI center is prolonged then consider transporting to the nearest appropriate facility for stabilization prior to transport to a Level I STEMI center.
5. Continue to reassess the patient. If the patient's condition changes then start back at (2)(A) above and follow the state STEMI protocol outlined in (2) starting from (2)(A) and on according to the patient's condition.
6. Consider out-of-state transport based on local and regional process for the bi-state region.
7. Communicate electrocardiogram findings to the hospital.
8. If the patient has a positive electrocardiogram but is negative for signs of cardiogenic shock then go to step 3 in (2)(C) below.

- (C) Step 3- Calculate the estimated time from STEMI identification with the patient to expected percutaneous coronary intervention (PCI) with the patient in order to determine whether the patient is within the percutaneous coronary intervention window. Communicate electrocardiogram findings to the hospital. If no ST-elevation or new or presumed new left bundle branch block then consider a fifteen (15)-lead electrocardiogram, if available.
1. Group 1- If the patient is within the PCI window or the patient has had chest pain greater than twelve (12) hours or the patient is lytic/thrombolytic ineligible then transport to a Level I or Level II STEMI center according to local and regional process. Consider the time for transport; the air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas); the patient's condition; and all treatment windows. Consider the ischemic time and the potential role for lytics (within the lytic window) at an intervening STEMI center in route to the percutaneous coronary intervention center if approaching longer times within the percutaneous coronary intervention window. Continue to reassess the patient. If the patient's condition changes then start back at (2)(A) and follow the state STEMI protocol outlined in (2) starting from (2)(A) and on according

- to the patient's condition. Consider out-of-state transport based on local and regional process for bi-state regions.
2. Group 2- If the patient is outside the percutaneous coronary intervention window and within the lytic/therapeutic window, or outside both windows and the patient has no other known complications then transport to the STEMI center (Level I, II, III or IV) according to local and regional process. Consider the time for transport, air/ground/hospital options for timely and medically appropriate care (particularly in non-urban areas), the patient's condition and all the treatment windows. Consider the lytic window and the potential for STEMI center lytic administration when determining the destination(s). Continue to reassess the patient. If the patient's condition changes then start back at (2)(A) above and follow the state STEMI protocol outlined in (2) starting from (2)(A) and on according to the patient's condition. Consider out of state transport based on local and regional process for bi-state regions.
 - (3) When initial transport from the scene of illness or injury to a STEMI or stroke center would be prolonged, the STEMI or stroke patient may be transported to the nearest appropriate facility for stabilization prior to transport to a STEMI or stroke center.
 - (4) Nothing in this rule shall restrict an individual patient's right to refuse transport to a recommended destination. All ground and air ambulances shall have a written process in place to address patient competency and refusal of transport to the recommended destination.
 - (5) Ground and air ambulances are not required to use the state transport protocols in this rule when the ambulance is using a community-based or regional plan that has been approved by the department pursuant to section 190.200.3, RSMo that waives the requirements of this rule. Copies of flow charts of an algorithm depicting the stroke and STEMI state transport protocols are available at the Health Standards and Licensure (HSL) office, online at the department's website www.health.mo.gov or may be obtained by mailing a written request to the Missouri Department of Health and Senior Services, HSL, PO Box 570, Jefferson City, MO 65102-0570 or by calling (573) 751-6400.

AUTHORITY: sections 190.185 and 190.241, RSMo Supp 2011.

PUBLIC COST: This proposed rule will not cost state agencies or political subdivisions more than (\$500.00) in the aggregate.

PRIVATE COST: This proposed rule will not cost private entities more than (\$500.00) in the aggregate.

*NOTICE TO SUBMIT COMMENTS: Anyone may file a statement in support of or in opposition to this proposed rule with Teresa Generous, Director, Department of Health and Senior Services, Division of Regulation and Licensure, PO Box 570, Jefferson City, MO 65102. To be considered, comments must be received within thirty (30) days after publication of this notice in the **Missouri Register**. No public hearing is scheduled.*

Title 19—DEPARTMENT OF HEALTH AND SENIOR SERVICES
Division 30- Division of Regulation and Licensure
Chapter 40-Comprehensive Emergency Medical Services Systems Regulations

PROPOSED RULE

19 CSR 30-40.780 Definitions and Abbreviations Relating to the Transport Protocol for Stroke and the Transport Protocol for ST Segment Elevation Myocardial Infarction (STEMI) Patients.

PURPOSE: This rule defines terminology related to the state transport protocol for stroke and the state transport protocol for STEMI.

- (1) The following definitions and abbreviations shall be used in the interpretation of the rule in 19 CSR 30-40.790.
 - (A) Field is the specific area or location, outside of the hospital, where an injury, accident or medical emergency occurs requiring immediate assistance of medical personnel for the purpose of treating or transporting the sick or injured to another location for treatment;
 - (B) Local and regional process is the process that has been established and agreed upon specifically pertaining to a local city, town or small district or a combination of localities forming a regional area. This is not the community-based or regional plan;
 - (C) Lytics are thrombolytic drugs, including recombinant tissue plasminogen activator, used to dissolve clots blocking flow in a blood vessel. These lytic/thrombolytic drugs are used in the treatment of acute ischemic stroke and acute myocardial infarction;
 - (D) Lytic/therapeutic window is the period of time during which lytics can be administered following the onset of symptoms in order to reduce brain or heart injury;
 - (E) Lytic therapy (fibrinolysis/thrombolysis) is drug therapy used to dissolve clots blocking flow in a blood vessel. It refers to drugs used for that purpose, including recombinant tissue plasminogen activator. This type of therapy can be used in the treatment of acute ischemic stroke and acute myocardial infarction;
 - (F) Lytic/thrombolytic ineligible patients are those patients identified as ineligible for lytic/thrombolytic therapy due to specific contraindications. An appropriate course of treatment will be utilized when lytic/thrombolytic therapy is contraindicated;
 - (G) Out of the lytic/therapeutic or potential therapeutic window is the period of time following the accepted time (lytic/therapeutic window and potential therapeutic window) frames for specific therapies for a patient suffering an ischemic stroke;
 - (H) Outside of the Percutaneous Coronary Intervention (PCI) window is the period of time following the accepted timeframe in which PCI is most advantageous and recommended;

- (I) Percutaneous Coronary Intervention (PCI) is a procedure used to open or widen narrowed or blocked blood vessels to restore blood flow supplying the heart;
- (J) Percutaneous Coronary Intervention (PCI) window is a timeframe in which PCI is most advantageous and recommended;
- (K) Potential therapeutic window is the period of time after the accepted window for lytic therapy has expired in which interventional therapy may be beneficial in restoring blood flow during an ischemic stroke; and
- (L) Recombinant tissue plasminogen activator (t-PA also known as rt-PA) is a thrombolytic (clot-dissolving) agent the goal of which is to destroy the thrombus (clot) within the blood vessel by stimulating fibrinolysis (clot breakdown) to allow restoration of blood flow.

AUTHORITY: sections 190.185 and 190.241, RSMo Supp 2011.

PUBLIC COST: This proposed rule will not cost state agencies or political subdivisions more than (\$500.00) in the aggregate.

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Section 3:

TCD Task Force Resources and Recommendations

Time Critical Diagnosis System Resource

TCD Trauma Task Force Recommendations

Adult Trauma Patient Classification/Prioritization Information for
Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: A resource for distinguishing adult trauma patients by the severity of symptoms in order to assist the transport to the appropriate designated trauma center.

Emergent Group

Immediate life threat: Transport to **the closest trauma center or hospital emergency department capable of managing the condition**

Trauma I: Treatment Window Goal- Within 60 minutes from time of injury to appropriate trauma center.

Destination transport decision, including mode, should consider time for transport, patient condition, and treatment window, with the goal to secure the appropriate treatment for the patient as expeditiously as possible; plan for bi-state regions accounts for out-of-state transport when appropriate. Special circumstances that might necessitate transport to a level III trauma center or closest appropriate ED relative to patient condition may include but not be limited to poor weather conditions, distance, changes in patient condition, resource requirements, and specialty availability.

Includes vital sign and anatomy of injury as below:

- Glasgow Coma Scale < 14 at time of report
- Systolic Blood Pressure: <90 at any time
 - and/or clinical evidence of shock
 - for example altered mental status; pallor; cool, clammy or mottled skin; shallow breathing
 - Heart Rate: >120
- Respiratory rate: < 10 or > 29

If any of the above present, and especially if two or more of the above present, suspicion should be high for serious injury and shock.

CDC and MO. Anatomic criteria:

- All penetrating injuries to head, neck, torso, and extremities (boxer short and T-shirt areas) proximal to elbow and knee
- Flail chest, airway compromise or obstruction, hemo- or pneumothorax, or patients intubated on scene
- Two or more proximal long-bone fractures
- *Extremity trauma with loss of distal pulse*
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fractures
- Paralysis or signs of spinal cord or cranial nerve injury
- Active or uncontrolled hemorrhage: for example, significant arterial or venous bleeding relatively controlled with direct pressure but still active or only controlled by tourniquette
- *Severe Burns with Associated Trauma: 2nd/3rd degree burns >20% BSA (> 10% BSA in over 50) or any signs of inhalation injury*
 - *If trauma presents the greater immediate risk, triage to trauma center according to triage protocol.*
 - *If the burn injury poses the greatest risk for morbidity and mortality, patient should be transferred to burn facility. follow burn guidelines and local and regional plan*
- *Isolated Severe Burns: 2nd/3rd degree burns >20% BSA (> 10% BSA in over 50) or any signs of inhalation injury*

- *Triage to burn facility [peds: 2nd/3rd degree >10% BSA ages <10 or >20% BSA or any signs of inhalation injury] follow burn guidelines and local and regional plan]]*
- Medical Director/Medical Control Discretion: ambulance medical director or receiving hospital medical control according to local or regional plan

Trauma II: Treatment Window Goal- Within 90 minutes from time of injury to appropriate trauma center.

Destination transport decision, including mode, should consider time for transport, patient condition, and treatment window, with the goal to secure the appropriate treatment for the patient within the treatment window, via ground and/or air; plan for bi-state regions accounts for out-of-state transport when appropriate. Special circumstances that might necessitate transport to another appropriate center relative to patient condition may include but not be limited to poor weather conditions, distance, changes in patient condition, resource requirements, and specialty availability.

Includes Biomechanics of injury and evidence of high energy transfer:

- High-risk auto crash: Considered as > 40 mph or highway speeds
 - Intrusion, including roof: > 12 in occupant site; > 18 inches in any site; refers to interior compartment intrusion
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with high risk of injury or highway speed
- High-risk Pedestrian, Cycle, ATV Crash
 - Auto v. Pedestrian/bicyclist thrown, run over, or with significant (> or = 20 mph) impact
 - Motorcycle or ATV crash > or = 20 mph with separation of rider or with rollover
- Falls > or = 20 ft (one story = 10 ft.)
- *Crush, degloved, or mangled extremity*
- *All open fractures*
- Consider Femur fracture: long bone fracture; DOES NOT including hip fracture
- Trauma with prolonged Loss of Consciousness: this includes the patient who had a witnessed LOC but is conscious on EMS arrival or who cannot recall events from a point in time preceding the event
- Pregnancy with acute abdominal pain associated with traumatic event; **Traumatic Event:** one in which an individual can acquire injuries and/or wounds brought on by either an outside force or an outside energy. These injuries and/or wounds may affect one or more body systems by blunt, penetrating or burn injuries. These injuries may be life altering, life threatening or ultimately fatal wounds. DOES NOT include pain associated with routine pregnancy pain or discomfort

Also consider

- Penetrating injuries distal to T-shirt and boxer area to wrist or ankle

Trauma III: Treatment Window Goal- 120 minutes from time of injury to appropriate trauma center.

Destination transport decision, including mode, should consider time for transport, patient condition, and treatment window, with the goal to secure the appropriate treatment for the patient within the treatment window; plan for bi-state regions accounts for out-of-state transport when appropriate.

- Age: Older Adults > age 55
- Falls: 5-20 Feet
- Lower-risk Crash: considered as
 - MVC < 40 MPH or UNK speed,
 - Auto v. Pedestrian/bicyclist with <20 mph impact
 - Motorcycle or ATV crash < 20 mph with separation of rider or rollover
- Medical Co-Morbidity
 - Anticoagulation and bleeding disorder
 - All pregnant patients involved in traumatic event. **Traumatic Event:** one in which an individual can acquire injuries and/or wounds brought on by either an outside force or an outside energy. These injuries and/or wounds may affect one or more body systems by blunt, penetrating or burn injuries. These injuries may be life altering, life threatening or ultimately fatal wounds.

- *Less Severe Burns 10% (<50 years of age) to 20% 2nd or 3rd degree*
 - *With trauma:*
 - *If trauma presents the greater immediate risk, triage to trauma center according to triage protocol.*
 - *If the burn injury poses the greatest risk for morbidity and mortality, patient should be transferred to burn facility. follow burn guidelines and local and regional plan*
 - *Without trauma: triage to burn facility*
- *Amputation distal to wrist or ankle of two or more digits (follow replant guidelines and local regional plan)*
- **Near drowning/ Near hanging**
- EMS provider judgment

Also consider:

- Penetrating injury distal to wrist or ankle
- Assault without Loss of Consciousness
- Suspected elder physical abuse
- Suspected domestic violence

Section 190.142.4, RSMo, mandates emergency medical technicians shall, among other things, perform only patient care that is ordered by a physician or set forth in protocols approved by the medical director. This document is not intended to allow emergency medical technicians to perform patient care other than what is ordered by a physician or set forth in protocols approved by the medical director as set forth in section 190.142.4, RSMo.

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Time Critical Diagnosis System Resource

TCD Trauma Task Force Recommendations
Burn Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide information for the care of burn patients by emergency medical personnel.

1. Ensure that Airway, Breathing, and Circulation are addressed. **Protect Airway, refer to 7f below for further information.**
2. Treatment
 - a) Eliminate source of burn.
 - b) Estimate percent of body surface area (BSA) and depth.
 - c) Treat associated trauma.
 - d) Dress wounds appropriately with Dry, Sterile Dressings
3. DO NOT GIVE ANYTHING BY MOUTH.
4. DO NOT PLACE ICE OR ICE PACKS ON ANY PEDIATRIC PATIENTS OR ADULT PATIENTS WITH BURNS GREATER THAN 5% TOTAL BODY SURFACE AREA.
5. Keep patient warm.
6. Patients presenting with altered mental status or nausea with vomiting, seizures, loss of consciousness or marked dyspnea in the face of suspected carbon monoxide or toxic inhalation with or without minor burns should be placed on high flow oxygen, 100% O₂. Patients in closed space incidents are more likely to manifest these symptoms. Consider intubation as patients may require emergent airway management.
[Address Hyperbarics as part of inter-facility transfer resource and information]
7. Indications for Transport to a Center Specializing in Burn
 - a. Second and third degree burns greater than 10% body surface area (BSA) in patients under 10 or over 50 years of age
 - b. Second and third degree burns greater than 20% body surface area (BSA) in any patient
 - c. Burns of the face, hands, feet, genitalia, perineum, or major joints
 - d. Electrical burns, including lightning or contact with high voltage (220 volts or greater)
 - e. Chemical burns
 - f. Suspected inhalation injury: Assess airway for direct thermal injury as noted by singed nasal hairs, facial burns, and soot in mouth. Patients with suspected inhalation injury may need emergent airway management.
 - g. Circumferential burns
 - h. Burn injury in patients with preexisting medical conditions that could complicate management, prolong recovery, or affect mortality (COT)

8. Patients with burns and trauma should be referred to the nearest appropriate trauma center, not a burn center, according to the following:
- If trauma presents the greater immediate risk, triage to trauma center according to triage destination protocol.*
 - If the burn injury poses the greatest risk for morbidity and mortality, patient should be transferred to burn facility. follow burn procedures and local and regional plan*

[Children who meet burn inclusive criteria who have not reached their 15th birthday should be transported to a center that can manage pediatric burns . Move to an interfacility transfer information and resource document.]

9. Initiate IV/IO access in unburned area, if possible. Otherwise initiate an IV/IO access in an area of burn per local regional protocol or after discussion with on-line medical control, if unable to obtain an IV in unburned area. Secure IV/IO access.
- If age-related vital signs and patient's condition indicate hypo perfusion (0-28 days < 60 mmHg, 1-12 months < 70 mmHg, 1-10 years <70+2 times age in years, > 10 years <90mmHg) administer initial fluid bolus of 20 mL/kg isotonic crystalloid IV/IO, Lactated Ringers preferable. If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg isotonic crystalloid IV/IO. For children <5 years of age, call on-line medical control prior to administering a second fluid bolus.
 - Consider additional fluid administration
 - Titrate to a systolic pressure appropriate for age and injury pattern. Maximum Fluid Dose:
 - ADULTS: 2,000mL, including all boluses, without on-line medical control
 - PEDIATRICS: 40 ml/kg with a maximum fluid dose of 2000 ml, including all boluses, without on-line medical control
 - Call medical control for persistent signs and/or symptoms of hypoperfusion.
10. Consider narcotic administration per regional/local protocol for pain management.
11. Continue general patient care.

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Reference:

Adapted from *the Maryland Medical Protocols for Emergency Medical Services Providers, Effective July 1, 2009 Maryland Institute for Emergency Medical Services Systems and Pre-Hospital Treatment Protocols, Seventh Edition, Effective 6/6/08, Massachusetts Department of Public Health-Emergency Medical Services*

Burn Center Guidelines

The committee on Trauma of the American College of Surgeons (ACS) and the American Burn Association (ABA) have identified that **the following injuries generally require referral to a burn center.**

1. Partial thickness burns greater than 10% total body surface area (TBSA)
2. Burns that involve the face, hands, feet, genitalia, perineum, or major joints
3. Third-degree burns in any age group
4. Electrical burns, including lightning injury
5. Chemical burns
6. Inhalation injury
7. Burn injury in patients with preexisting medical disorders that could complicate management, prolong recovery, or affect mortality Burns in any patients with concomitant trauma (such as fractures) in which the burn injury poses the greatest risk of morbidity or mortality. In such cases, if the trauma poses a greater immediate risk than the burns, it may be necessary to stabilize the patient in a trauma center before being transferred to a burn unit. Physician judgment is necessary in such situations and should be in concert with established triage protocols.
8. Burns in children being cared for in hospitals without qualified personnel or equipment for the care of children
9. Burn injury in patients who will require special social, emotional, or long-term rehabilitative intervention.

American Burn Association Categorization of Burns

MAJOR BURN

- 25% of BSA or greater
- Functionally significant involvement of hands, face, feet, or perineum
- Electrical or Inhalation Injury
- Concomitant Injury or severe pre-existing medical problems

MODERATE BURN

- 15-25% BSA
- No complications or involvement of hands, face, feet, or perineum
- No electrical injury, inhalation injury, concomitant injury
- No severe pre-existing medical problem

MINOR BURN

- 5% or less BSA
- No involvement of hands, face, feet, or perineum.
- No electrical burns, inhalation injury, severe pre-existing medical problems, or complications

Time Critical Diagnosis System Resource

TCD Trauma Task Force Recommendations
Traumatic Brain Injury (TBI) Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide information for the pre-hospital management of Traumatic Brain injuries (TBI) in both adults and children.

1. Identify mechanism of injury
2. Stabilize/secure airway, breathing, circulation
3. Neuro exam
 - a. Assess pupils
 - i. Asymmetric, difference > 1 mm+
 - ii. Unilateral or bilateral dilated and fixed pupils
 - b. Assess gaze
 - c. Assess posturing (extension/flexion)
 - d. Assess GCS, preferably prior to administration of sedative or paralyzing agents or after these drugs have been metabolized
 - i. Use standard GCS protocol for adults and children > 2 years of age
 - ii. Use P-GCS protocol for children < 2 years of age

Transportation

4. Go to an age appropriate neurosurgical capable trauma center per local/regional plan with immediately available CT, ability to monitor intracranial pressure, and ability to treat intracranial hypertension if patient demonstrates one or more of the following:
 - a. GCS \leq 8
 - b. Progressive loss of two 2 points in GCS starting at initial score \leq 13
 - c. Unilateral or bilateral dilated and fixed pupils
 - d. Posturing

Treatment

5. Assess oxygenation and systolic BP at least every 5 minutes
 - a. Keep O2 sats > 90%
 - b. Keep SBP > 60 mmHg 0-28 days of age, >70 mmHg 1-12 months of age, > 70+2 times age in years 1-10 years, > 90mmHg in children > 10 years of age, and > 90 mmHg in adults using isotonic crystalloid
 - c. Maximum dose 2,000 mL or 40 ml/kg for pediatric patients without on-line medical control
 - d. Maximum dose 2,000 mL in adults without on-line medical control
 - e. Call medical control for persistent signs and symptoms of hypoperfusion
6. Either ETCO₂ or Capnography (Continuous or Waveform): Goal ETCO₂ 35-40 mmHg

7. Analgesia/sedation: Avoid long acting agents if possible and use short acting Neuromuscular Blockers, benzodiazepines, etc according to local regional plan. If neuromuscular blocker used, short acting sedative agents, repeated as needed, are recommended.
8. Hyperventilation should only be used in patient's exhibiting signs of herniation, such as extensor posturing or no response, dilated and unreactive pupils, or progressive neurologic deterioration (decrease in GCS >2 points from patient's prior best score in patients with initial GCS <9), and only while exhibiting those signs
 1. hyperventilate at 20 breaths/minute in adults,
 2. 25 breaths per minute in children, and
 3. 25-30 breaths/minute in infant < 12 months.
 4. Goal ETCO₂ 30-35 mmHg
9. Mannitol in the field is NOT recommended for direct scene transports.

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Time Critical Diagnosis System Resource

TCD Trauma Task Force Recommendations
Replantation Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide information for the pre-hospital management of amputations of the extremities and other body parts that can be replanted.

I. Introduction:

This information focuses on the pre-hospital management of amputations of the extremities (i.e. digits, upper and lower extremities) and other body parts that can be replanted (e.g. scalp, ear, penis). **Appropriate transport of the patient per field triage protocol and local regional plan to a facility that is capable of managing potential replant candidates at the time of transport is essential.**

II. Pre-Hospital Communication

Only the receiving surgeon should make the determination of whether an amputation can be replanted or not. The receiving surgeon is the most knowledgeable person to make the determination about whether an amputated part can be replanted or not, so others should refrain from counseling the patient.

In communicating with the receiving surgical team, the following information should be relayed to the would-be replantation team:

- a. Patient age
- b. Hand dominance (if hand/upper extremity injury)
- c. Occupation
- d. Current tobacco use
- e. Amputation site(s)
- f. Mechanism of injury
- g. Time of injury
- h. Location/Setting (at home, factory, farm, etc.) of injury
- i. Condition of the patient, including associated injuries and medical co-morbidities if known
- j. Condition of the amputated part(s)
- k. Estimated transport time to the facility

III. Management of the Patient

- a. Standard ITLS or PHTLS protocol should be applied to ensure that Airway, Breathing, and Circulation are addressed.
- b. If the amputation stump is bleeding, pressure should be applied with gauze bandages. The extremity should be elevated.
- c. Tourniquets should be avoided if at all possible unless hemorrhage is uncontrollable by direct pressure or hemostatic dressing.
- d. Blind attempts to control bleeding using hemostats or other instruments should be avoided, given the potential for damage to nerves or other important structures in the vicinity of the bleeding vessel.
- e. If possible, two large-bore IVs should be placed, in extremities other than that which is injured.

IV. Management of the Amputated Part

- a. **Always** retrieve and transport the amputated part if it can be found.
- b. Briefly irrigate the part with normal saline or lactated Ringer's solution.
- c. Wrap the part in a moist (not soaking wet) saline or Ringer's-soaked gauze and then put into a zip-top resealable plastic bag or other similar container that can be sealed. This bag or container should then be put into a separate larger container of ice or an ice-saline slush. **The part should never be placed directly on ice or in ice water, and dry ice should never be used.**
- d. Expediently transport the patient and part to a facility that can provide definitive care. This is essential as ischemia time is very limited, which is especially true for amputations that involve a significant amount of muscle tissue (e.g. arm, leg).

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Reference:

Adapted from the Division of Plastic Surgery, University of Missouri-Columbia Hospitals and Clinics, resource document 2008

Time Critical Diagnosis Resource System Resource

TCD Trauma Task Force Recommendations
Spinal Cord Injury Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide information for the pre-hospital management of traumatic spinal cord injuries for both adults and children by emergency medical services personnel.

Adults:

1. Ensure that Airway, Breathing, and Circulation are addressed. **Protect Airway**
2. Spinal motion restriction and protect entire head, neck, and spine.
3. Initiate IV/IO isotonic crystalloid fluid therapy.
4. Titrate to a systolic pressure of 90 mm Hg.
5. Consider additional fluid administration
 - a. Maximum dose 2,000 mL without on-line medical control
6. Indications for transfer to a Level I or II Trauma Center:
 - a. Paralysis or signs of spinal cord or cranial nerve injury- from field triage doc.

Pediatrics: less than 15 years of age

1. Ensure that Airway, Breathing, and Circulation are addressed. **Protect Airway**
2. Spinal motion restriction and protect entire head, neck and spine.
3. Initiate IV/IO isotonic crystalloid.
 - a. If age-related vital signs and patient's condition indicate hypoperfusion (0-28 days < 60 mmHg, 1-12 months < 70 mmHg, 1-10 years <70+2 times age in years, > 10 years <90 mmHg) administer initial fluid challenge of 20 mL/kg isotonic crystalloid IV/IO. If patient's condition does not improve, administer the second bolus of fluid at 20 mL/kg isotonic crystalloid IV/IO.
 - i. Consider additional fluid administration
 - ii. Titrate to a systolic pressure appropriate for age and injury pattern
 - iii. Maximum dose 2,000 mL or 40 ml/kg for pediatric patients without on-line medical control
 - iv. Call medical control for persistent signs and/or symptoms of hypoperfusion.
4. Consult with nearest level I or II Trauma Center and, when possible, a Pediatric Trauma Center.

5. Indications for Referral to a Trauma Center with pediatric spine capability:
 - a) Paralysis or signs of spinal cord or cranial nerve injury.
6. Continue General Patient Care.

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Reference:

Adapted from *the Maryland Medical Protocols for Emergency Medical Services Providers, Effective July 1, 2009, Maryland Institute for Emergency Medical Services Systems* and *Pre-Hospital Treatment Protocols, Seventh Edition, Effective 6/6/08, Massachusetts Department of Public Health-Emergency Medical Services*.

Time Critical Diagnosis System Resource

TCD Trauma Task Force Recommendations

Pediatric Trauma Inter-Facility Transfer Resource Information for the Severely Injured Patient for Pre-Hospital and Hospital Emergency Medical Services.

This document is intended to be a living document and will be updated once the new Pediatric Trauma Regulations are approved to reflect the new Level 1 Pediatric Trauma, Level 2 Pediatric Trauma, and Pediatric Capable Center Designations.

I. Goal:

Guide the expedient and appropriate inter-facility transfer of severely injured pediatric patients from the first facility providing care to definitive care at a Level 1 Pediatric Trauma Center.

II. Definition:

A pediatric patient is anyone who has not reached their 15th birthday or anyone with an injury requiring specific pediatric expertise.

III. Criteria for Appropriate/Recommended Transfer: (The below list is not all inclusive)

Physiologic Criteria (as referenced in the ATLS manual and curricula)

1. Decreased or deteriorating neurologic status GCS < 14
2. Respiratory distress or failure
3. Endotracheal intubation and/or ventilatory support and children requiring anesthesia
4. Shock of any type, compensated or uncompensated
5. Injuries requiring blood transfusion
6. Care requiring any one of the following:
 - a. Invasive monitoring (arterial and/or central venous pressure)
 - b. Intracranial pressure monitoring
 - c. Vasoactive medications

Anatomic Criteria

1. Fractures and penetrating injuries to an extremity which may be complicated by neurovascular and/or compartment injury
2. Fracture of two or more long bones (femur, humerus, tibia/fibula)
3. Suspected Injury to the axial skeleton or spinal cord
4. Traumatic amputation and crush injuries
5. Significant head injury with any of the following either suspected or documented (No need to validate with imaging studies prior to transfer.):
 - a. Basilar skull fractures with potential for cerebrospinal fluid leaks
e.g., hemotympanum
 - b. Open and/or penetrating head injuries
 - c. Depressed skull fractures
 - d. Decreased level of consciousness

- e.g., GCS < 14
- e. Intracranial hemorrhage or contusion
- f. Suspected concussion syndrome with persistent symptoms (emesis, confusion and/or headache)
- 6. Penetrating (into the subcutaneous tissue) wounds to the head, neck, thorax, abdomen, pelvis or proximal extremity
- 7. Pelvic fracture
- 8. Blunt injury to the chest or abdomen
- 9. Ocular injuries
- 10. Degloving injuries especially with possible tendon injury
- 11. Suspected child abuse
- 12. Burns: (ABA Burn Center Referral Criteria)
 - a. partial thickness burns greater than 10% TBSA
 - b. Burns that involve the face, hands, feet, genitalia, perineum, or major joints.
 - c. Third degree burns
 - d. All burns with associated trauma

IV Resources for transfer

- A. Hospital resources: If the child's known or suspected injuries exceed resources available at an institution, the patient should be transferred expeditiously to a Level 1 Pediatric trauma center with the goal of having the patient moved on thru the system within 60 minutes. Do not delay the transfer for diagnostic procedures that do not change the immediate plan of care.

Within 15 minutes of patient arrival:

1. Primary survey with life saving measures (airway management, fluids, hemorrhage control)
2. Contact receiving facility and identify patient as a trauma transfer
3. The accepting MD will discuss appropriate care and transfer. This will include:
 - i. Name, age, and weight of patient
 - ii. Mechanism of injury
 - iii. Time of injury
 - iv. GCS
 - v. Suspected injuries
 - vi. Hemodynamic stability
 - vii. Proposed mode of transfer
 - viii. Discussion should include treatments provided, including any diagnostic exams.

Within 30 minutes of patient arrival

1. Collaborate with receiving facility regarding the specific mode of transportation and patient care requirements during transfer
2. Transfer facility responsibilities:
 - i. The sending facility will identify the accepting MD and complete the EMTALA form. In addition, copies of the MR will be included, these are:
 - ii. 2 Face Sheet (name, address, etc)
 - iii. EMS Run sheet (if available)-based on regional plan
 - iv. ED record to include physician, nursing documentation, medication administration, and fluid status (intake/output)
 - v. Copies of lab/diagnostic results and dictations

Template for an Inter-facility Transfer Check-list

Items to send with patient and transfer crew:

- (2) Face Sheet (name, address, etc)
- EMS Run Sheet (if available)-based on regional plan
- ED Physician Notes (H&P or other document)
- Copies and interpretation of any diagnostic and lab work.
-)
- Copy of ECG (if applicable)
- Copy of medication administration record
- Intake and output record
- (2) Copies of ED record
- Copy of signed transport transfer consent
- Discharge Dictation (if applicable)
- Medical necessity

Name of pt: _____ Age: _____

Suspected
injury: _____

Transfer to: _____

Accepting Physician: _____

Transferring Hospital _____

Transferring Physician _____

<p><u>Transfer Level of care:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> BLS/ALS <input type="checkbox"/> Adult Critical Care Transport <input type="checkbox"/> Pediatric Critical Care Transport 	<p><u>Method of transfer:</u></p> <ul style="list-style-type: none"> <input type="checkbox"/> Ground ambulance Name of Service: _____ <input type="checkbox"/> Rotary Wing (helicopter) Name of Service: _____ <input type="checkbox"/> Fixed Wing (airplane) Name of Service: _____
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- Family given written directions to facility
- Family given phone number of receiving unit or receiving Emergency Dept
- Family given patient belongings
- Family contact phone number: _____

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Time Critical Diagnosis System Resource

TCD Task Force Stroke Recommendations
Stroke Patient Classification Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE:

To distinguish suspected stroke patients by the onset of symptoms in order to assist the transport to the appropriate designated stroke center for timely and medically appropriate care. The local and regional process determines appropriate process for delivering patient to designated level of care in transport protocol, i.e. primary and secondary triage and transfer, ground vs. air, etc.

Goal: to secure the appropriate treatment for the patient within the treatment window.

Emergent Group:

Immediate life threat

Otherwise categorize patients based on the following **times last known well:**

Group I: Lytic/Therapeutic Window:

< 3 hours

Group II: Potential Therapeutic Window:

3-6 hours

Group III: Out-of-Lytic/Therapeutic and Potential Therapeutic Window:

>6 hours

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Time Critical Diagnosis System Resource

TCD Task Force Stroke Recommendations

Stroke Information for Pre-Hospital Emergency Medical Services

PURPOSE: To provide information on the treatment of patients experiencing a suspected stroke. Stroke should be treated as a time critical emergency.

ON SCENE Recommendations

1. ABCs. Maintain oxygen saturation $>$ or $=$ 94%. If oxygen saturation falls below 93%, administer low flow oxygen at 2-4 LPM. Do not routinely administer high flow oxygen to stroke patients. If the patient has shortness of breath, oxygen saturation less than 93%, or decreased level of consciousness, increase oxygen as needed.
2. Obtain blood glucose level. Treat hypoglycemia according to local regional plan.
3. Obtain vital signs including 12-lead ECG and a brief history (time last known well). Make sure to get a phone number where someone knowledgeable of the patient's current condition and health history can be contacted immediately (preferably a cell phone).
4. Perform a basic stroke exam using the Cincinnati Prehospital Stroke Scale or other regionally accepted validated stroke scale. The stroke exam used must be consistent across the region.
5. Do not delay transport. Transport urgently to a stroke center (on scene time of 10 minutes or less). Determine if patient should be transported by ground or air.
6. Patient can sign an 'Against Medical Advice' form if they insist on alternate location.

EN ROUTE Recommendations

1. Contact receiving facility and notify of suspected stroke patient as soon as possible.
2. Establish an IV on unaffected side if possible, preferably AC, 18ga.
3. Perform an expanded stroke exam if time and patient condition will allow (see reference below).
4. Do not treat hypertension without specific approval from the receiving facility. Contact receiving facility for instructions if hypertension present.
5. Patient should be transported with head elevated no more than 20 degrees, unless risk of

aspiration is present.

6. Patient handoff at the hospital should include:
- ✓ patient assessment and condition upon arrival, including time last known well;
 - ✓ care provided;
 - ✓ changes in condition following treatment;
 - ✓ specific immediate family contact and/or person with knowledge of the patient's condition or witness to event information;
 - ✓ Time and type (pre-hospital or clinic/hospital provider) first medical contact
 - ✓ Time for dispatch and on scene
 - ✓ Contraindication to lytic
 - ✓ History of kidney dysfunction/ bleeding
 - ✓ When call came into dispatch

References: MNDS Miami Neurologic Deficit Scale, NIHSS, LA SS, Cincinnati SS

Acronyms:

- ABC- Airway, Breathing, Circulation
- AC- Antecubital
- ECG-Electrocardiogram
- EMS-Emergency Medical Services
- Ga-Gauge
- IV- Intravenous
- LPM- Liters per Minute
- Mg/dl-miligrams per deciliter
- TCD-Time Critical Diagnosis

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Time Critical Diagnosis System Resource

TCD Task Force Stroke Recommendations
Inter-Facility Transfer Information for Stroke Patients Not on Lytics for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide clear information for the transport of a Stroke patient from one facility to another. This usually occurs in an effort to move the Stroke patient to a higher level of care where necessary resources optimize recovery. This information is specific to a Stroke patient that is not receiving any lytics at the time of the transfer.

Patient Care Communication Hand-off Information

It is recommended that the referring hospital provide EMS staff and the receiving hospital the following information which is beneficial for patient care:

1. A phone number where a family member or care provider knowledgeable of the patient's current condition and health history can be contacted immediately (preferably a cell phone).
2. Documentation (patient assessment and condition upon arrival, including time last known well; medical records, available lab results, medication and dose and time given) hand-off to EMS or by fax to receiving hospital)
3. Ongoing transport orders
4. Contact information for the ED physician at both the referring and receiving facilities
5. CT films or CD with patient (CT films or CD should always be sent with patient; however, do not delay transport if not readily available).
6. Report on neurologic status or NIH Stroke Scale (recommended) if available.
7. Specific location destination at receiving hospital (i.e. room, department).

The referring hospital should provide EMS staff the following time documentation:

1. Last known well/normal
2. Arrival time at referral hospital
3. Time EMS called for transport
4. CT (when completed and when read/reviewed)
5. Time of departure

The TCD Task Force recommends that during transport EMS should:

1. Contact receiving hospital for medical control if condition deteriorates or there is a significant change in blood pressure (BP) during transport
 - a. If blood pressure > 180/105

- b. If patient develops hypotension
2. Document GCS, neuro checks with Cincinnati or other validated Stroke scale, and vital signs every 15 minutes.
3. Transport patient with head elevated no more than 20 degrees.
4. Not give any anti-platelets or anti-coagulants.
5. Maintain strict NPO.
6. Maintain O2 saturation above > or = 94% during transport.
7. Call receiving hospital at least 10 minutes prior to arrival.

Upon Arrival:

EMS staff should turn over the documented information sent from the referring hospital as well as the following to the receiving hospital:

1. Care provided by EMS
2. Changes in condition following treatment

Acronyms: AC- Antecubital
 ASA- acetylsalicylic acid
 CT- Computed Tomography
 EMS-Emergency Medical Services
 EMT-Emergency Medical Technician
 INR- International Normalized Ratio
 IV- Intravenous
 NPO-nothing by mouth
 NS- Normal Saline

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Time Critical Diagnosis System Resource

TCD Task Force Stroke Recommendations
Inter-Facility Transfer Information for Stroke Patients Receiving Lytics for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide clear information for the transport of a stroke patient from one facility to another. This usually occurs in an effort to move the stroke patient to a higher level of care where necessary resources optimize recovery. This information is specific to a stroke patient that is receiving lytics at the time of the transfer.

Patient Care Communication Hand-off Information

It is recommended that the referring hospital provide EMS staff and the receiving hospital the following information which is beneficial for patient care:

1. A phone number where someone knowledgeable of the patient's current condition and health history can be contacted immediately (preferably a cell phone).
2. Documentation (patient assessment including mental status and condition upon arrival, including time of onset; medical records, available lab results, medication and dose and time given) hand-off to EMS or by fax to receiving hospital
3. Ongoing transport orders
4. Contact information for the clinician at both the referring and receiving facilities
5. CT films or CD with patient (CT films or CD should always be sent with patient; however, do not delay transport if not readily available)
6. Report on neurologic status or NIH Stroke Scale (recommended) if available
7. Specific destination location (i.e. room, department)
8. Confirm 2 peripheral IVs (preferably 18ga AC)
9. The exact tPA dose that the patient is to receive during transport
 - a. The referring hospital is to dispose of any excess amount of tPA above what patient is to receive.
 - b. Standard FDA approved dosing is 0.9 mg/kg, with 10% given as bolus and the remainder dripped over one (1) hour. Maximum dose of 90 mg.
 - c. Referring hospital to discuss tPA administration with receiving hospital prior to administration.
 - d. Or "If IV tPA dose administration will continue en route, verify estimated time of completion. Verify with the sending hospital that the excess tPA has been withdrawn from the tPA bottle and wasted, so that the tPA bottle will be empty when the full dose is finished infusing. For example, if the total dose is 70 mg, then there would be an

extra 30 ml that has been withdrawn and wasted since a 100mg bottle of tPA contains 100 ml of fluid when reconstituted. In addition, the sending hospital should apply a label to the bottle with the number of ml's of fluid that should be in the bottle (so if there is a problem with the pump en route, the correct dosage is noted). (MA transport guideline)

10. Verify that blood pressure (BP) less than 180/105 prior to transport
 - a. If higher, referring hospital to discuss with receiving hospital prior to transport

The referring hospital should provide EMS staff the following time documentation:

1. Last known well/normal
2. Arrival time at referral hospital
3. Time EMS called for transport
4. CT (when completed and when read/reviewed)
5. Documentation and review with transport team: lytics bolus, infusion, and expected completion time.
6. Documentation of neuro checks and vital signs every 15 minutes.
7. Time of departure.

The TCD Task Force recommends that during transport EMS should:

1. Discontinue lytics and contact receiving hospital for medical control if condition deteriorates.
2. Contact receiving hospital medical control if there is a significant change in blood pressure (BP) during transport
 - a. If blood pressure > 180/105
 - b. If patient develops hypotension
3. Document GCS, neuro checks with Cincinnati or other validated stroke scale, and vital signs every 15 minutes.
4. Transport patient with head elevated no more than 20 degrees.
5. Maintain strict NPO
6. Maintain O2 saturation > or = 94% during transport.
7. Do not give any anti-platelets or anti-coagulants.
8. Call receiving hospital at least 10 minutes prior to arrival.

Upon Arrival

EMS staff should turn over the documented information sent from the referring hospital as well as the following to the receiving hospital:

1. Care provided by EMS
2. Status of lytics: total dose patient to receive and is to receive and/or time of completed infusion or remainder to be infused

3. Changes in condition following treatment

Acronyms:	AC- Antecubital
	ASA- acetylsalicylic acid
	CD- Compact Disc
	CT- Computed Tomography
	EMS-Emergency Medical Services
	EMT-Emergency Medical Technician
	INR- International Normalized Ratio
	IV- Intravenous
	NIH-National Institutes of Health
	NPO-nothing by mouth
	NS- Normal Saline
	PIVs-Peripheral IVs
	tPA-recombinant tissue Plasminogen Activator

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Time Critical Diagnosis System Resource

TCD Task Force STEMI Recommendations
STEMI Patient Classification Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE:

To distinguish STEMI patients by the severity of symptoms in order to assist the transport to the appropriate designated STEMI center for timely and medically appropriate care. The local and regional process determines appropriate process for delivering patient to designated level of care in transport protocol, i.e. primary and secondary triage and transfer, ground vs. air, etc.

Emergent Group

Immediate life threat

Cardiogenic Shock Group

Elevated ST or new or presumed new left bundle branch block on ECG **AND** Exhibit two of the following additional signs for **cardiogenic shock**:

- Hypotension, Systolic Blood Pressure < 90
- Respiratory Distress, <10 or >29
- Tachycardia, Heart Rate > 100

Goal: to secure the appropriate treatment for the patient as expeditiously as possible.

Group I Includes:

- Elevated ST or new or presumed new left bundle branch block on ECG
- Symptoms of acute coronary syndrome
- Within PCI Window **OR** Chest Pain >12 hours **OR** Lytic/Thrombolytic ineligible
- **No cardiogenic shock**

Goal: to secure the appropriate treatment for the patient within the treatment window. Consider ischemic time, patient condition, transport time and lytic window and potential for lytic administration on the way to Level I or II center in destination(s) determination. Lytic administration prior to end destination (Level I or II STEMI Center) may be a consideration, in particular in non-urban areas of the state, if exceeding the 60 to 90 minute mark within the PCI window before PCI achievable.

Group II Includes:

- Elevated ST or new or presumed new left bundle branch block on ECG
- Symptoms of acute coronary syndrome
- Out of PCI Window
- In Lytic/Therapeutic window: **Consider transport for lytics if within lytic window**
- **No cardiogenic shock/no other complications**

Goal: to secure the appropriate treatment for the patient within the treatment window

Definitions:

- 1. PCI Window: PCI administered within 120 minutes of STEMI identification**
- 2. Out-of-PCI Window: PCI not achievable within 120 minutes of STEMI identification**
- 3. Lytic/Therapeutic Window: Lytics administered within 30 minutes of STEMI identification**

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Time Critical Diagnosis System Resource

TCD Task Force STEMI Recommendations
STEMI Information for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide treatment information regarding patients experiencing a suspected STEMI. STEMI should be treated as a time critical emergency.

In the first 30 minutes of patient contact, the following should be considered:

1. ABCs; administer oxygen; obtain vital signs, SAMPLE history/medication and allergy information; apply ECG and continuously monitor.
2. Obtain a 12-Lead ECG within 5 minutes of patient contact and transmit/communicate ECG findings as early as possible to the appropriate receiving center. If time permits, obtain serial 12 leads during transport. Obtain 15 lead ECG if available and time permits.
3. If STEMI identified by EMS and confirmed by STEMI center
 - a) Determine whether patient is within time window for PCI or lytics
 - i. If part of local/service practice determine lytic eligibility
 - b) determine destination
 - c) activate STEMI/cath lab team.
 - d) Determine if patient should be transported by ground or air.
4. Patient can sign an 'Against Medical Advice' form if they insist on alternate location.
5. Begin transport urgently to the appropriate STEMI center following either approved community plan or state plan for STEMI patients.
6. Unless already administered in relation to the event, or contraindicated, administer aspirin (consider dosing per AHA guidelines).
7. Consider other anti-platelet agents based on STEMI receiving center guideline.
8. If part of local/service practice, consider lytic administration in field if patient is eligible without contraindications.
9. Maintain oxygen saturation > 92%.
10. Establish IV, large bore if possible, (preferably in left arm).

11. If SBP > 110 mmHg and patient has active chest pain or discomfort, administer *Nitro* per regional guideline.

Avoid Nitro if

- a) If RV infarct identified
- b) Patient is taking an erectile dysfunction drug.

12. If chest pain or discomfort persists despite repeated Nitro and/or Nitro contraindicated and SBP >110 mmHg, consider administration of narcotics according to local/regional guideline.

13. If SBP < 90 mmHg and patient is not in acute pulmonary edema or having RV infarct, administer a fluid challenge of 250 to 500 ml with continued monitoring of oxygen saturation and lung sounds.

14. Contact Medical Control for further orders as soon as possible.

15. EMS staff should provide the receiving hospital with the following patient handoff information:

- ✓ patient assessment and condition upon arrival, including time of symptom onset, time on scene
- ✓ copies of 12-lead ECG;
- ✓ care provided (Run sheet);
- ✓ changes in condition following treatment; and
- ✓ immediate family contact information as available.
- ✓ Times for dispatch and on scene
- ✓ Contraindication to lytic
- ✓ History of kidney function/ bleeding
- ✓ When call came into dispatch
- ✓ Time and type (pre-hospital or clinic/hospital provider) of First Medical Contact

16. This and other treatment may be decided by regional committees/ consensus, where discussion on this information extends into further treatments (such as anti-platelets, anti-coagulation, beta blockers) beyond the information as outlined above.

Acronyms:

- A, B, C's- Airway, Breathing, Circulation
- BP-Blood Pressure
- ECG-Electrocardiogram
- EMS-Emergency Medical Services
- IV-Intravenous
- PCI-Percutaneous Coronary Intervention
- RV- Right Ventricle
- STEMI-ST-Elevation Myocardial Infarction

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Time Critical Diagnosis System Resource

TCD Task Force STEMI Recommendations
Information for Inter-Facility Transfer for STEMI Patients Not on Lytics for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide clear information for the transport of a STEMI patient from one facility to another. This usually occurs in an effort to move the STEMI patient to a higher level of care where necessary resources optimize recovery. This information is specific to a STEMI patient that has not received any lytics prior to or during transfer.

Patient Care Communication Hand-off Information

It is recommended that the referring hospital provide EMS staff and the receiving hospital the following information which is beneficial for patient care:

1. A phone number where a family member or care provider knowledgeable of the patient's current condition and health history can be contacted immediately (preferably a cell phone).
2. Documentation (patient assessment including mental status and condition upon arrival, including time of onset; medical records, available lab results, medication and dose and time given) hand-off to EMS or by fax to receiving hospital
3. Ongoing transport orders specific to patient
4. Contact information for the ED physician at both the referring and receiving facilities
5. ECG sent with patient.
6. Specific location destination at receiving hospital (i.e. room, department).
7. If the following are present the referring hospital to discuss with receiving hospital prior to transport:
 - a. Heart failure
 - b. RV infarct
 - c. Arrhythmia
 - d. Extremes of BP

The referring hospital should provide EMS staff the following time documentation:

1. Time of symptom onset
2. Time and type of first medical contact (pre-hospital or clinic/hospital provider)
3. ECG(when completed)/Time of ECG STEMI diagnosis
4. Arrival time at referral hospital
5. Time EMS called for transport
6. Time of departure

The TCD Task Force recommends that during transport EMS should:

1. Contact receiving hospital for medical control if condition deteriorates (for example, develop signs/symptoms of heart failure; RV infarct; arrhythmia; extremes of BP)
2. Document ECG/rhythm strip and vital signs every 15 minutes.
3. Maintain strict NPO.
4. Maintain O2 saturation above 92% during transport.
5. Call receiving hospital at least 10 minutes prior to arrival.

Upon Arrival

EMS staff should turn over the documented information sent from the referring hospital as well as the following to the receiving hospital:

1. Care provided by EMS
2. Changes in condition following treatment

Acronyms:	AC-
	ASA-
	CT-
	EMS-Emergency Medical Services
	EMT-Emergency Medical Technician
	INR-
	IV-
	NPO-nothing by mouth
	NS-

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Time Critical Diagnosis System Resource

TCD Task Force STEMI Recommendations
Information for Inter-Facility Transfer for STEMI Patients On Lytics for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide clear information for the transport of a STEMI patient on lytics from one facility to another. This usually occurs in an effort to move the STEMI patient to a higher level of care where necessary resources optimize recovery. This information is specific to a STEMI patient that is receiving or has received any lytics prior to or at the time of transfer.

Patient Care Communication Hand-off Information

It is recommended that the referring hospital provide EMS staff and the receiving hospital the following information which is beneficial for patient care:

1. A phone number where a family member or care provider knowledgeable of the patient's current condition and health history can be contacted immediately (preferably a cell phone).
2. Documentation (patient assessment including mental status and condition upon arrival, including time of onset; medical records, available lab results, medication and dose and time given) hand-off to EMS or by fax to receiving hospital
3. Ongoing transport orders specific to the patient
4. Contact information for the ED physician at both the referring and receiving facilities
5. ECG sent with patient.
6. Information on lytics administered
 - a. Type of lytic and route
 - b. Dose and time of administration
 - c. Specify antiplatelet and anticoagulant agents given (type and dose and time of administration)
7. The referring hospital should provide specific direction for management of the patient receiving lytics during transport, including specific instruction regarding dosing and administration of any ongoing treatment, including contingency planning for interruption.
8. Specific location destination at receiving hospital (room, department).
9. If the following are present the referring hospital to discuss with receiving hospital prior to transport:
 - a. Heart failure
 - b. RV infarct
 - c. Arrhythmia
 - d. Extremes of BP

The referring hospital should provide EMS staff the following time documentation:

1. Time of symptom onset
2. Time and type of first medical contact (pre-hospital or clinic/hospital provider)
3. ECG(when completed)/Time of ECG STEMI diagnosis

4. Arrival time at referral hospital
5. Time EMS called for transport
6. Time lytics given
7. Time of departure

The TCD Task Force recommends that during transport EMS should:

1. Contact receiving hospital for medical control if condition deteriorates (for example, stroke symptoms; signs/symptoms of bleeding; extremes of BP; signs/symptoms of heart failure/RV infarct; arrhythmia).
2. Document ECG/rhythm strip and vital signs every 15 minutes.
3. Maintain strict NPO.
4. Maintain O2 saturation above 92% during transport.
5. Call receiving hospital at least 10 minutes prior to arrival.

Upon Arrival

EMS staff should turn over the documented information sent from the referring hospital as well as the following to the receiving hospital:

1. Care provided by EMS
2. Status of lytics: total dose patient received and is to receive and/or time of completed infusion or remainder to be infused
3. Changes in condition following treatment

Acronyms:

- AC-
- ASA-
- CT-
- EMS-Emergency Medical Services
- EMT-Emergency Medical Technician
- INR-
- IV-
- NPO-nothing by mouth
- NS-

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Time Critical Diagnosis System Resource

TCD Task Force Recommendations
Information for Helicopter Use for Time Critical Diagnosis Patients for Pre-Hospital and Hospital Emergency Medical Services

PURPOSE: To provide information on when to request an air ambulance response for transport of a time critical diagnosis patient. An air ambulance should be considered when it will assist the **Time Critical Diagnosis patient** in arriving at the appropriate facility for a potential time critical intervention.

Destination transport decision for trauma, stroke, and STEMI patients, including mode of transport, should consider:

1. The circumstances below in Section I “a” through “e”
2. The patient presentations (below, Section II) included in the state’s transport protocol and classification information and their prioritization of these time critical patients, including the respective destination determination for each presentation type and recommendations for air and/or ground transport
3. and/or the approved community plan (19 CSR 30-40.770); plan for bi-state regions accounts for out-of-state transport when appropriate.

This information does not preclude provider judgment or consideration of patient presentation not included here.

Section I: The following circumstances should be taken into consideration when determining mode of transport for a Time Critical Diagnosis patient:

- a) the patient has a significant potential to require a time-critical intervention for a time critical condition and an air medical helicopter will deliver the patient to an appropriate facility faster than ground transport
- b) the patient requires a high level of Advanced Life Support not available by ground transport
- c) the patient is located in a geographically isolated area which would make ground transport impossible or greatly delayed
- d) utilization of ground ambulance would leave the local community without adequate ambulance coverage
- e. provider judgment

Section II. Patient Presentations:

A. Trauma and Burn Patient:

Types of Patients that may have severe injury include but are not limited to:

Level of Consciousness and Vital Signs

- GCS < 14
- Systolic Blood Pressure < 90
 - AND/OR Clinical Evidence of Shock
- Respiratory Rate <10 or >29

Anatomy of Injury

- All penetrating injuries to head, neck, torso, and extremities (boxer short and T-shirt areas) proximal to elbow and knee
- Flail chest, airway compromise or obstruction, hemo- or pneumothorax, or patients intubated on scene
- Two or more proximal long-bone fractures

- Extremity trauma with loss of distal pulse*
- Amputation proximal to wrist or ankle
- Pelvic fractures
- Open or depressed skull fractures
- Paralysis or signs of spinal cord or cranial nerve injury
- Uncontrolled hemorrhage
- *Severe Burns with associated trauma: triage to trauma center according to risk from each*
- ISOLATED Severe Burns: triage to burn facility*

Biomechanics of Injury and Evidence of High-Energy Impact

- High-risk auto crash
 - Intrusion, including roof: > 12 in occupant site; > 18 inches in any site
 - Ejection (partial or complete) from automobile
 - Death in same passenger compartment
 - Vehicle telemetry data consistent with high risk of injury
- Pedestrian, Cycle, ATV Crash
 - Auto v. Pedestrian/bicyclist thrown, run over, or with significant impact, ≥ 20 mph
 - Motorcycle or ATV crash ≥ 20 mph [with separation of rider or rollover]

Falls: ADULTS ≥ 20 ft (one story = 10 ft.)

Crushed, degloved or mangled extremity

All open fractures

Femur fracture (long bone, NOT hip) with evidence of high energy impact

Trauma with prolonged Loss of Consciousness

Pregnancy with acute abdominal pain and traumatic mechanism

B. Suspected Stroke and STEMI

Ground EMS determines that helicopter transfer to a designated stroke or STEMI center will result in arrival at a facility that can provide treatment within the recommended time window and ground EMS cannot (19 CSR 30-40.790).

1. Suspected Stroke: Air medical activation for the suspected stroke patient is reasonable when ground transport to the stroke center is greater than one (1) hour away.

“Air transport service is particularly useful to facilitate stroke care in remote areas. As part of regional stroke systems of care, air medical activation for stroke is reasonable when ground transport to the nearest stroke capable hospital is more than 1 hour away.⁵ Local stroke hospitals may provide expertise to help create activation protocols and in-flight stroke management protocols to ensure safe and appropriate patient transports.^{36, 37”} (need reference)

Patient presentations INCLUDE:

- (A) life threatening conditions (serious airway or respiratory compromise or immediate life threatening conditions that cannot be managed in the field).
- (B) duration of onset of symptoms (based on time last known well).
 1. Group 1- the patient is within the lytic/therapeutic window
 2. Group 2- the patient is within the potential therapeutic window
 3. Group 3- the patient is within the out-of-lytic/therapeutic and out of the potential therapeutic window
- (C) Neurologic deterioration; field to hospital or hospital to hospital (to be further defined via email work group)
 - Criteria for neurologic deterioration include:
 1. Deterioration in NIHSS
 2. Deterioration in Cincinnati Stroke Scale

3. Deterioration in GCS

2. STEMI patient: Patient presentations INCLUDE:

- (A) life threatening conditions (serious airway or respiratory compromise or immediate life threatening conditions that cannot be managed in the field).
- (B) vital signs and the electrocardiogram identifies Cardiogenic Shock with the following:
 - 1. ST elevation in two contiguous leads or new or presumed new left bundle branch block; and
 - 2. The patient has two of the following three signs of cardiogenic shock:
 - (A) Hypotension where systolic blood pressure is less than 90 mmHG;
 - (B) Respiratory distress where respirations are less than ten (10) or greater than 29 per minute; or
 - (C) Tachycardia where the heart rate is greater than 100 beats per minute (BPM).
- (C) Estimated time from STEMI identification with the patient to expected percutaneous coronary intervention (PCI)
 - 1. Group 1- the patient is within the PCI window or the patient has had chest pain greater than twelve (12) hours or the patient is lytic/thrombolytic ineligible
 - 2. Group 2- the patient is outside the PCI window and within the lytic/therapeutic window, OR outside both windows, and the patient has no other known complications.

Ground EMS and/or the STEMI center confirms a STEMI and **transport from scene to STEMI center (Level I or II) is greater than 60 minutes by ground or if anticipated time from EMS first contact to reperfusion by ground is greater than 90 minutes.**

If a Level III or IV STEMI center is within 30 minutes of scene EMS first contact, patient should be taken there by ground.

Section III: Other Considerations

- A. Early Activation (AAMS Position Statement 2006): Early Activation is a method of activation for an air ambulance available to dispatch, on scene public safety or EMS, and hospitals for transport from scene or for inter-facility transport. The examples of circumstances and patient presentations noted above may be amenable to an early activation process.
- B. Working Knowledge of TCD System and local/regional processes: It is recommended that dispatch, pre-hospital, and hospital personnel familiarize themselves with the components of the TCD System and local and regional processes.

Acronyms:

- ATV-All terrain vehicle
- BSA-Body surface area
- EMS-Emergency Medical Services
- EMD-Emergency Medical Dispatchers
- HELP-Helicopter Early Launch Process
- PEDS-Pediatric, under xx years of age
- STEMI-ST-Elevation Myocardial Infarction

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Reference 36, 37

36 Svenson JE, O'Connor JE, Lindsay MB. Is air transport faster? A comparison of air versus ground transport times for interfacility transfers in a regional referral system. *Air Med J*. 2006;25:170-172.

37. Chalela JA, Kasner SE, Jauch EC, Pancioli AM. Safety of air medical transportation after tissue plasminogen activator administration in acute ischemic stroke. *Stroke*. 1999;30:2366-2368.

AAMS Position Statement (2006):

"AAMS defines "***Early Activation***" as departing for the requested scene prior to arrival of the first responders, based on a high index of suspicion that specialty services will be necessary. This is initiated by the request of the first responders."

Section 4:

Performance Improvement

Pre-Hospital Performance Improvement

MARS Active Data Elements

You may follow the link below to access the list of active data elements.

<http://health.mo.gov/living/healthcondiseases/chronic/tcdsystem/pdf/marsactivedataelements.pdf>

TCD Trauma Task Force Trauma Data Dictionary*

2011

***These are recommendations developed by the TCD Trauma Task Force and not part of the trauma regulations.**

The Missouri Trauma Data Dictionary is for use in addition to the National Trauma Data Dictionary. The goal of this addition is to further clarify and or define specific data elements to optimize the consistency and validity of data collected within the state of Missouri and in accordance with national guidelines. "A designated trauma registrar is critical to the success of a registry." (Resources for Optimal Care of the Injured Patient, 2006)

Missouri State Trauma Data Dictionary- 2011

The National Trauma Data Standard Data Dictionary (NTDS), by Missouri State Regulation 19 CSR 30-40.430, is the primary guide for trauma data collection with additional state specific definition and guidance added to optimize the value of Missouri aggregate trauma data. If a notation specific to a data element is not made it is assumed to be adequately defined by the NTDS Data Dictionary guidance alone. If there is any lack of clarity, guidance from the state should be requested rather than relying on personal or facility interpretation.

Definitions- MO state clarifications

1. Hospital admission will include any patient admitted to the hospital through the ED or by direct admission who meets the National Trauma Database (NTDB®) criteria. This would include an observation situation if the patient is actually transferred out of the ED and onto a floor for a period of time greater than 6 hours. In the case of a patient that comes into the ED with a traumatic injury, requires surgical treatment but does not require further hospitalization after the procedure, the OR visit is considered an admission. This will help provide more accurate capture of trauma injury incidence and resource utilization. In the case of retention within the ED department for observation, an encounter would be deemed an admission if the patient encounter were greater than 6 hours.

The “greater than 6 hour time frame” provides for the inclusion of those patients that need medical supervision or treatment with the intention of excluding those patients simply waiting for diagnostic results or consultation. This definition will also allow for the inclusion of those patients who are admitted but boarded in the ED waiting for a hospital bed.

Hospital admission will include any patient admitted to the hospital through the ED or by direct admission who meets the National Trauma Data Bank (NTDB®) criteria. This would include an observation situation when the patient is actually transferred out of the ED and onto a floor and would also include retained patients housed in the ED for an extended period of time with the intent to admit, but would not include those patients just waiting for a consult or diagnostic results then discharged. This would allow more accurate capture of trauma injury incidence and resource utilization.

2. Traumatic Injury inclusion time frame: The NTDB does not have a time frame of injury occurrence attached to patient inclusion however in the state of Missouri; a patient who is admitted to a facility within 48 hours of the initial injury event or within 48 hours of the time of injury discovery will meet inclusion criteria. There are exceptional circumstances in which the patient is in some manner prevented from being admitted within the 48 hour time frame but presents for **initial** care of traumatic injury upon discovery. Burn patients with injury severe

enough to require hospital admission will evolve within the 48 hours. A patient trapped or found down and presenting for **initial** trauma care outside the 48 hour time parameter would also meet criteria. Rationale: Lengthy pre-admission time frames allow for the development of complications and late effects not reflective of patient care measures. Chronic or accumulated injury is more likely to be represented in a “no time frame” inclusion criteria and therefore not to be included. However the incidence of child abuse, entrapment, and repeated falls by the elderly resulting in acute injury are examples where the “within 48 hours of time of discovery” allows inclusion.

The NTDB® does not have a time frame of injury occurrence attached to patient inclusion however in the state of Missouri: a patient who is admitted to a facility **for acute care of an initial injury event** or upon discovery of traumatic injury will meet inclusion criteria. Discovery describes those exceptional circumstances in which the patient is in some manner delayed in presentation for **initial acute care of traumatic injury** and is admitted upon discovery of such injury (burns, child or adult abuse, entrapments) in which case these patients would also meet inclusion criteria.

When an injury is recognized as chronic or having accumulated over an extended period of time with no acute injury at presentation for treatment, the patient would not be deemed a patient appropriate for state trauma registry inclusion, however a facility may choose to enter this patient into their own facility registry.

3. Pt Inclusion: All patients with **traumatic** injuries (traumatic MOI) that are within the NTDB inclusion codes without regard to age or multiplicity of injuries are included by Missouri state definition in the registry.

4. Pathological fractures: Patients with osteogenesis imperfecta, osteopenia, osteoporosis, and other conditions which can contribute to spontaneous fracture are included in the trauma registry when there is a **traumatic mechanism** causing the injury that meets criteria. Documentation in the medical record by the physician stating the fracture is pathological is most definitive but not always present. When “pathological fracture” is not stated but there is clear documentation “the patient heard a pop then fell” the fracture can be considered pathological not traumatic. **The best source when in doubt is to ask the physician for clarification. Contributing medical conditions should be captured as co morbidities.**

The case of peri prosthetic fractures needs to be specifically addressed here. According to appropriate coding periprosthetic fractures due to traumatic MOI are to be included.

6. Transferred patient: “In order to be a transfer, the patient must arrive by ground or air emergency medical service from the initial acute care facility. If a patient comes from an initial facility to a higher level facility by other than EMS transport mode and they meet inclusion

criteria they are considered an admission not a transfer”(NTDB). In the state of Missouri, patients who are transferred **to or from a facility with physician intervention** according to state protocol, but the mode of transportation is other than ground or air medical service, i.e. private vehicle, will still be considered a transfer patient and can be entered in the trauma registry as such. **If a patient comes to your facility as a transfer, whether they are admitted or discharged from your ED, based on that transfer status they meet inclusion criteria.**

National Trauma Data Standard Data Elements: The NTDS definitions are considered clearly defined and to be followed as stated with the exception of the following data elements which are more specifically defined for use in Missouri trauma data collection.

Demographics

D_012 Sex: The sex of a patient in the case of sex reassignment is the sex assigned when the patient is admitted for care as a result of a traumatic injury. This could possibly be a problem with logic if gender specific anatomy is included in traumatic injury so some adjustment or notation may be required.

Injury

I_01 Date and Time of Injury: Estimates of date and time of injury can be based on time reported by patient, family, witness, friend, or healthcare provider but **should not** be based on proxy measures i.e. EMS/911 call time. If unknown it should be recorded as such. If more than one time of incident occurrence is documented, the most reliable source is the source closest to the event. (example first responder as opposed to ED trauma flow sheet)

I_03 Work related: This data element refers to paid employment only not work done as a volunteer or in an illegal manner.

I_06 Primary E code: The primary E code is selected as the external cause or mechanism of injury for that injury which required hospital admission and treatment. In a case where two injuries resulting each from a different MOI, the most severe injury would be used to determine the primary E code. Example: A person has a minor MVC with only a laceration and contusion to their forehead but when exiting the vehicle falls down an embankment and severely fractures their leg. The primary E code would be the fall and the secondary E code the MVC. A mass casualty situation would require a mass casualty E code be primary. The AIS code severity digits can be used to determine which injury, in a multiple injury situation with different mechanisms, is considered more severe. When no determination can be made independently, ask the physician for clarification. Cataclysmic events take priority except for abuse. For Example; struck by flying board as a direct result of a tornado, projectile due to tornado would have primary Ecode for tornado 908.1 with secondary E code for the struck by E 917.9

I_07 Location of Injury: The location E code should be chosen based on the actual physical location where the injury occurred. This code does not reflect the activity of the person injured. A person working in a store as employee of that store, shopping in a store, or building a shelf in a store as employee of maintenance company are all in a public building.

I_09 Injury Zip code: If at all possible the zip code of the injury location should be determined and entered. In rural situations or where this is not exactly known, the zip code of the city or township nearest the injury location to which the EMS unit responded may be entered as defined in I_13. The internet can provide zip codes through various websites. When no determination of zip code can be made, enter “unknown” and complete the other fields by entering the city, county, and state fields as known.(See Trauma Registry Manual)

I_14 Protective Devices: If there are **no protective devices in use at the time of injury** the correct null value is “none” regardless of whether a specific profession commonly uses protective devices. “Lap belt only” is the default when “restrained” is used and no further indication of 3 point restraint or model year of vehicle.

I_16 Air Bag Deployment: “Air bag not deployed: is the appropriate entry when there is the presence of an airbag documented, observed or known and it did not deploy. When there is no presence of an air bag documented the air bag selection under protective devices would **not** be selected. “Air bag deployed front” is the default when air bag deployment is documented but not further specified as to which air bag.

Pre Hospital

P_01 – P_06 Note: Some software allows the entry of both an initial scene EMS transport and also a facility to facility EMS transport time and service. If only one EMS entry is possible in the case of a transfer, the initial facility becomes the scene with the transferring EMS service and times entered. This still allows the correct location and time of injury to be entered in the injury location fields.

P_08 Other Transport mode: When EMS times etc for only one mode of transport is allowed by your software, other modes of transport used during the patient event may be captured in this field. Example; Pt hurt in farm field, went to urgent care by private vehicle, EMS ground transported to facility. Private vehicle can be entered into this field as other transport mode. The injury location/scene, although not the EMS pickup point, remains the farm field.

P_09-P_17: Initial vital sign values in the field are to be entered for the primary initial evaluation. Any missing VSs if documented within 5 minutes of the initial recording can be used. Any other missing VSs or those documented outside the 5 minute box are entered as “unknown” or “not recorded” if you have a not recorded option. The oxygen saturation should

be that assessed and recorded before the administration of any supplemental oxygen. Follow GCS entry guidelines closely as written. **Initial GCS even if not evaluated at the same time as the other VS should be entered as initial assessment.**

The time period after first responder arrival and when the INITIAL set of vital signs (VS) can be taken and recorded can vary according to scene and patient conditions. The INITIAL set of VS are to be entered as the primary evaluation. For any missing INITIAL vital signs, a vital sign can be entered as INITIAL if documented within 5 minutes of the initial set of VS recorded. Any other missing VS or those documented outside the 5 minute box are entered as “unknown” or “not recorded” if you have a not recorded option. The oxygen saturation should be that assessed and recorded before the administration of any supplemental oxygen if possible, however in any case the initial oxygen saturation should be recorded if known.

****The directions for field VSs applies to initial ED/hospital VS and GCS as well. ED_03- ED_13.**

Emergency Department Information

ED_02_ED Arrival Time: At those facilities which have a hybrid medical record where documentation on the paper Nurse Trauma Flow Sheets can differ in documentation of time of arrival with the electronic documentation, the facility can determine which is the most accurate capture of patient arrival time and should be entered.

ED_06 - ED_07 Respiratory Rate with and without assistance: When a patient does not have assisted respirations enter the unassisted value in appropriate field and in the assisted rate field enter “N/A”. When a pt has assisted respirations the value in the unassisted field should be “0”. Assisted respirations are defined as – mechanical or external support of respirations ie. Bagged, ventilated, mouth to mouth resuscitation. If a patient has an airway in place it follows that their respirations are assisted.

ED_15 Alcohol Use Indicator: It is important to enter values for this field appropriately to show if the patient was tested. “N/A” indicates pt was not tested, the values beginning with “0” indicate the patient was tested. If no mention of testing is documented and no results found it is assumed no testing was done. If a legal draw was documented and no results found enter “unknown”.

E_16 Drug Use Indicator: The drug use indicator field’s purpose is to capture use by the patient of prescription and/or illegal drugs and not reflect any drugs administered by health care personnel. A patient may receive medication at an originating facility in the case of transfer or en route in which case those medications would not be recorded as positive in a drug screen. (Refer to the table of common medications for intubation and pain relief in the Trauma Manual and the Drug Tables).

E_17 ED Discharge Disposition: A patient is **not admitted** to the hospital when they are transferred out, discharged from, or died in the ED. The date and time of the ED discharge/Death is entered but no admission occurred. If the patient transferred in, they would meet NTDB® criteria for inclusion even if they were discharge from or died in the ED since they were a transfer. A trauma patient who comes directly to your facility for care and is not admitted but discharged from the ED would not meet NTDB® or state criteria for inclusion but may meet facility criteria in which case the patient can be entered in the facility registry but would not be uploaded to the NTDB® or state. **Any expiration in the ED due to traumatic mechanism of injury meets NTDB® criteria for inclusion.**

ED_18 Signs of Life: This field replaced the ED Death data fields and is well defined. May be mapped.

Hospital Procedures – 2011 revised list posted 2-15-2011

HP_01 Hospital Procedures: The NTDS has provided a list of procedures which should be entered as a minimum as well as any operative or essential procedures occurring during the patient encounter in **your facility only**. Those procedures done at other facilities or en route by EMS are not appropriately entered here. Note those procedures “*” that even if done multiple times need only be entered once. If your facility chooses to enter multiple like procedures for their own purposes keep in mind there is a limit of **200** procedure entries available. . **When two or more surgeons from different services are involved as primary surgeon for a procedure during one operative encounter the same surgery encounter number is used with each surgeon’s procedures assigned specifically to the appropriate surgeon.(One operative/anesthesia encounter)**

Procedure Time: When the actual time of a procedure has not been documented but there is undeniable evidence a procedure was done, i.e. post reduction film or documented presence of a chest tube, it is acceptable to capture the procedure time according to the time stamp of the evidence.

Diagnoses and Co Morbid Conditions:

DG_01 Co-Morbid Conditions: The NTDS has provided definitions for each of the co morbid conditions which include only those conditions diagnosed and present **before** the injury occurred. DNR status must be documented as in effect pre injury by an Advanced Directive and related to a co morbid condition. When only a non NTDB co morbid exists then the appropriate entry is 1“Other” meaning there is no NTDB co morbid documented, and then enter the non NTDB co morbid that is documented. When there are **NO co-morbid conditions at all** the appropriate entry is “**N/A**” meaning this list is not appropriate to collect for this patient.

DG_02 Injury Diagnoses: Maximum number entered 50: Injury diagnoses are entered using the ICD 9 CM codes. Some software allows text and /or code entry and maps the text to ICD 9 and AIS codes. In any case the registrar needs to monitor and edit when necessary the code mapping to see that it is correct. When entering diagnoses the most severe injury as indicated by the AIS severity digit should be entered first and then in descending order of severity; this allows the registrar to capture the most severe injuries when querying the database with limited injury data points. When all injury codes are entered and there is a specific need to capture a medical non traumatic condition relative to the

encounter, the ICD 9 codes for those appropriate conditions can be entered after all injury coding is complete. These non trauma codes cannot be mapped to AIS or text but can be captured this way. Examples: cases where a stroke precipitated a fall with a fracture or an MI preceded a MVC etc.

The ICD 9 codes field is a national element field: ICD 9 codes are used by the NTDB for injury identification and categorization. Auditing of the ICD 9 codes for assurance of correct mapping should occur if the code selection process begins with AIS coding the injuries which are then auto mapped by the software system to a corresponding ICD 9 code. Correct ICD 9 codes are of primary importance.

Injury Severity Information

IS_01 – IS_05 AIS code fields: Although the AIS codes are not national element fields, this anatomical injury coding system is used extensively in both the US and internationally to classify severity of injury. The post dot digit of the AIS code is used in the calculation of an ISS score which is a national element. Correct assignment and/or mapping of the AIS code is important for accurate severity capture of the trauma case load.

AIS Version: The NTDB accepts different versions of AIS coding but do not mix the coding selections within one record. Code all injury for any specific record by the definitions and code choices of just one version of AIS, there are differences in each version that when mixed would affect the integrity of the ISS.

Outcome Information

O_01 Total ICU Length of Stay: The NTDB directions are to count a partial day in the ICU as a full day value. At times the total ICU days can exceed the Hospital LOS which auto calculates. Value entry can be made to capture both the hospital LOS and NTDB count of ICU days accurately. The total of ICU days includes all episodes if a patient spends intermittent days in the ICU; all are counted in one value. If a patient spent no days in the ICU the appropriate value is “N/A”. In this way a pt with no time in the ICU will not factor into ICU statistics.(Refer to Trauma Manual)

O_02 Total Vent Days: Follow the same directions as ICU days.

General Directions

- **Note: Your facility’s trauma registry data fields which are national elements and common to both the NTDB and state are to be populated according to**

the NTDB values and guidelines and with any state clarification or guidance in mind. Any data fields custom to your facility may be populated as your facility describes.

- It is highly recommended that each trauma registry maintain a change log to capture the evolution of their trauma registry and as a record of the data elements captured and by what definition at any given time.
- It is also highly recommended that scheduled inter rater reliability checks and database validation processes be developed and implemented with necessary corrections and changes made. Validating 10% of your monthly caseload with 90% or greater accuracy is the standard recommended by the American College of Surgeons.
- The ACS guidelines indicate 80% of the Trauma registry records should be closed within 60 days after pt discharge for a registry to be considered current.
- Refer to the Missouri Trauma Registry Manual for resource and process information. Reference tables and resource websites are included.
- Each trauma patient record should be examined completely and in a systematic manner for comprehensive accurate abstraction.

State Trauma Registry

“State trauma registries are a valuable component of an effective and efficient trauma system. They are created through the aggregation of registry data from participating trauma centers and hospitals. The state trauma registry can be used for trauma system performance improvement, needs assessment, epidemiological purposes, and statewide research projects.”(Resources for Optimal Care of the Injured Patient, 2006)

TCD Trauma Task Force and TRAM Trauma Registry Manual*

2011

***These are recommendations developed by the TRAM group in partnership with the TCD Trauma Task Force and not part of the trauma regulations.**

The purpose of the Missouri State Trauma Registry Manual is to provide guidance and process direction for trauma registrars in order to protect and promote the integrity of trauma registry data. The value of trauma data is directly related to the knowledge and skill of the trauma registrar and provides the basis of many process improvement activities which directly affect care of the injured. "A designated trauma registrar is critical to the success of the trauma registry."(Resources for the Optimal Care of the Injured Patient 2006)

Missouri State Trauma Registry Manual- 2011

A primary purpose for aggregating trauma related data across the nation and within a state is to have documented evidence to direct and improve treatment and maximize outcome for the trauma population. In order to preserve data integrity each data element must be collected by the same definition and according to the same guidelines by each facility that contributes to the state database. To enhance data integrity across the state, the Missouri State Trauma Manual has been developed based primarily and by regulation on the National Trauma Data Dictionary.

According to Missouri State Regulation 19 CSR 30-40.430, the National Trauma Data Set will be the minimum state data set with the opportunity to add additional state and facility defined data elements. The Missouri State Trauma Registry inclusion criteria are the same as the NTDB® with some additional definition and clarification for state data consistency. The Missouri State Trauma Registry Data Manual will be updated annually or as necessary to continually improve and expand as a reference and resource for the Trauma Registrar.

The integrity and value of data entered in the state database will be directly affected by the training and expertise of the Trauma Registrars. The American Trauma Society provides the Trauma Register Course (the basic and advanced courses are now combined) that should be considered the minimum trauma registry training necessary. Knowledge of medical terminology and Human Anatomy are also important especially in light of the implementation of ICD 10 CM. The focus of this manual is to provide clarity of definition, references, and process guidance as the NTDB® national elements are entered into facility trauma registries for uploading into the state and national databases. Once the data has been entered in a facility trauma registry, the data will have to upload directly or be mapped to the corresponding fields at the state and national level therefore monitoring data mapping and working with the software providers will be a necessary function of each trauma department.

It is the responsibility of each trauma registrar to understand and follow the NTDB® data dictionary definitions of data elements, co morbidities, complications and guidelines. The NTDB® data dictionary can be found online at:

www.ntdsdictionary.org/dataElements/datasetDictionary.html

The NTDB® has left some data definitions up to a facility or state to define and in order to provide consistent state data, the following references and guidance can be utilized along with the state data dictionary. Other references and resources that can assist the Trauma Registrar are as follows:

1. Current Copy and/or online access to the **National Trauma Data Standard Data Dictionary** with accompanying change log, glossary, and appendices (a paper copy is recommended).

2. **ICD-9-CM or as of October 1, 2013 an ICD-10-CM codebook** (minimum- a current hard copy available in the trauma department)

3. **Human Anatomy** Book or Online resource

4. **“Resources for the Optimal Care of the Injured Patient”**: American College of Surgeons publication detailing requirements for trauma systems.(current version, the “Greenbook”)

5. **AIS Dictionary** current to the version being used by the registry for data entry. The most consistent injury coding will be possible when all facilities are using the same version of the AIS dictionary.

6. **TRAM** Trauma Registry Association of Missouri- This is a voluntary group of Missouri Trauma Registrars, Trauma Coordinators, Program Managers, and QA/PI Specialists who have joined together to work closely with the state in an effort to further trauma system education and development. TRAM also functions as a support group and resource for any facility and trauma department in the state of Missouri. TRAM, when possible, provides an annual Trauma Registry Conference to assist in keeping trauma registrars current and to provide the ongoing needs for continuing education. For those facilities with ACS, American College of Surgeons, verification, there is mandatory annual Trauma Registrar continuing education requirements. At present the ACS required CEUs are 4 CEUs per year.

TRAM has monthly teleconferences open to all trauma system and state personnel to address any issues in need of discussion, to provide and advertise educational opportunities, and provide a networking and communication tool within the state of Missouri.

The state contact at present is Shirley Gastler Shirley.Gastler@health.mo.gov

7. **Mentors**: Sometimes it is necessary to place a person with little to no medical education or training in a trauma registry position. In this situation it would be very advantageous to have an experienced trauma registrar act as a mentor, especially from the beginning, if only minimal on the job training is provided. A mentor with experience at a facility with the same or higher level of trauma center verification would be most appropriate.

8. **Registry Resource Groups**: There are times when a trauma registrar will need assistance in a particular area ie. PI/QI data gathering, management, or representation, coding issues, or software problems. It would be of benefit to all if those state registrars with exceptional ability or training in each of these specific areas could form a resource group to provide guidance or solutions which could be available to all. This would optimize the consistency and validity of data in the state of Missouri. The resource group participation would be voluntary and contact could be managed through TRAM or by the state office.

Processes – Good Practices

1. **Written Procedures:** It is good practice and necessary for consistency to have written procedures for data entry, record closing, and any other function of the trauma registrar. Not only will written procedures assist in the consistency and accuracy of the registry data but it will provide a basic training tool for any new trauma registrars. Written procedures also act as a record and reference for the developing trauma registry. As procedures are updated and changed the date of such should be part of the entry. Good written procedure is detailed to the extent a person unfamiliar with a procedure will be able to execute the function described successfully.

2. **Change Log:** It is important to keep a current log of any data element or process changes so that data can be entered and accessed accurately. When a data element is retired, new data elements added or changed, or data processes altered, it is important to note the date of implementation. Example: a request for the average time a Level 1 patient spends in the ICU could only be answered if a registry was capturing the ICU days data element for the time frame of the requested data. If the ICU days were only captured as of 2008 and not previously then only data from 2008 on would be available.

The Change Log can also be a reference for how a specific data field is being answered at your facility which should be according to state and/or national guidelines. If a field response is changed according to recommended guidelines, the change log will be the reference for how the field was entered at any specific time. It sometimes will occur that a field response will not change but the software mapping will change to maintain consistency with NTDB® in which case it is important to know how your software provider manages the NTDB® guideline changes.

3. **Communication with Software Provider:** There are at present two software providers for the state trauma registry data. It is important to maintain ongoing communication with your provider and to have an understanding of how your provider maps and manages your data in light of the state and national guidelines. Changes made by your provider should be made after input and consensus from users as to how any change will affect their data and if the change will have positive results for the state registry.

4. **Data reports and representation:** It is good practice when querying the database for information to run any report more than one way. Patient subsets can be described in

more than one manner and querying according to different definition can expose an error not obvious otherwise.

Example: A request for all Level 1 trauma patients that are female. One would write the query for all female Level 1 patients for a given time frame and get the answer of 52 out of 100 patients. It could be assumed the rest were male but unless one queried for male and the results was 48 you could not be sure you captured all the female patients. Any record that mistakenly had unknown entered would make your results invalid. By querying for both female and male separately you validate your results or discover an error that can be addressed. It is important to be sure you provide accurate data that can be validated.

- 5. Injury Coding:** Accurate coding for injury requires a thorough understanding of ICD-9-CM or as of October 1, 2013 ICD-10-CM and the Abbreviated Injury Scaling codes. It is highly recommended at least one trauma registrar at a facility take the AIS course offered by AAAM, American Automotive Association. Coding for traumatic injury does not follow all the same rules as coding for payment so it is important the trauma registrar is familiar with the injury coding guidelines. It is **not** good practice to use HIM, health information management, coding as your entry data unless you are assured the coders providing the codes are aware of and using trauma injury coding guidelines or the trauma registrar audits and adjusts the codes provided as necessary. If your registry requires the input of HIM coders as your coding source it would be good practice to provide trauma injury code training for the HIM coders. The severity value, a national element, is dependent on accurate injury coding and will impact the accurate depiction of trauma caseload at a facility and for each trauma surgeon.

Coding resources: Some facility Health Information Departments have stand alone encoders available to their HIM coders which, depending on user agreements, can also be available online for trauma registrars. The encoder is user friendly and can assist in appropriate code choice for diagnosis and procedure coding. If the use of an encoder is not available, then having a coder or group of coders in the HIM department willing to be a coding resource is valuable when difficult scenarios arise. The specific coding guidelines for trauma injury should still be followed.

There are resource books that deal specifically with diagnosis or procedure coding which can be a real asset to the trauma registrar.

Auditing of injury code mapping is necessary whether you enter text to code, enter ICD-9 which maps to AIS, or enter AIS codes which map to ICD-9, to assure the codes that are auto mapped are correct. If necessary manually edit the code to be correct or more specific if possible.

- 6. Procedure Coding:** It is important to capture all procedures indicated by the NTDB® list as well as any specific to your facility. Entering the procedures in reasonable chronological order is desirable even if your software program has filter options. Accurate procedure coding can be difficult so consulting with coding specialists, making coding reference sheets for researched commonly used codes, or using online coding references can greatly assist the trauma registrar in code selection. In some cases procedure coding will differ from coding for payment in order to provide better data for trauma inquiry purposes.

Example: When coding for payment and a splenectomy is done, the opening of the abdomen (exploratory laparotomy) is not coded only the splenectomy and the opening of the abdomen is considered the approach therefore not coded separately. In coding for trauma purposes your trauma department coders may choose to code the exploratory laparotomy **and** the splenectomy to better represent what was done and also to be able, when requested, to provide data on exploratory laparotomies separate from splenectomies and other abdominal procedures. The importance of coding consistency rests with the trauma registrars in your department and the need for aggregate data.

7. Validation:

- a. Inter-rater reliability:** It is important for consistency of data in a facility registry that all trauma registrars are following the same guidelines for data entry and have adequate knowledge to enter valid data. It is presently recommended by the ACS that 5-10% of a trauma registry database records are re abstracted on a monthly basis. ACS does not indicate, but it is suggested, that a 90-95% or greater abstraction consensus be maintained to assure consistency and accuracy of the data entered; the greater the consensus the greater data reliability.
- b. Database validation:** Validating database elements and logic in the entry of related data elements is important for maintenance of database integrity. Various data elements should be selected and reports run on a regular basis to expose logic errors, data absence errors, out of range errors, etc which can then be addressed and corrected. Consistent errors discovered can then be the subject of registrar training. A rotating schedule of defined sets of data elements

for one person responsible of validation, or assignment of different data element subsets to different registrars are two ways of accomplishing database validation. It is best to validate the database on a regular, at least monthly basis, especially before uploading data to the state or NTDB® or you may discover you have issues to be addressed in a time limited manner before your data can be accepted.

8. **Benchmarking:** Benchmarking is the process of measuring an organization's internal processes against those of organizations of the same class in order to identify, understand, and improve performance and outcomes. A positive result of consistent accurate data collection across the state of Missouri is the ability to benchmark practices and outcomes with other like facilities to optimize the efficiency and advancement of good practice in trauma patient care and trauma system function.
9. **State Reports:** The aggregation of trauma data across the state following the state regulations and guidelines will allow state benchmarking to be possible. Defining the appropriate reports to be made available and establishing state benchmarks will provide a tool illustrating in what areas a facility needs to improve, is doing well, and how they are performing in relationship to other comparable facilities within the state and nationally.
10. **Use of Unknown:** It is better to enter “unknown” in a data field than to have bad data that has been entered in a field as an unfounded estimate or guess. If there is a definitive basis for an estimate as in the case of “time of occurrence of an incident” based on a documented statement “2 hours ago” with the time of the statement documented, then the estimated time is appropriate. However, guessing a zip code based on the EMS unit at the scene or estimating the time of an incident just because it occurred within the city limits with the assumption that surely someone would have called 911 right away would be incorrect entries. Unknown is the appropriate entry when there is no documentation. There is a hierarchy of sources listed in the NTDB® dictionary for each data element that provides guidance as to which source would be most reliable when there is conflicting documentation within the same record.
11. **Data Presentation:** There are many ways to represent data which can assist in relaying the intended information to the viewer. Dashboards and scoreboards can be used for clear “at a glance” data on ongoing PI issues being addressed with results tracked regularly. Spreadsheets with accompanying charts and graphs are excellent ways to inform administrators as well as illustrate the value of your trauma registry. It is

important to validate that the presentation of data is as accurate as the data itself and reflects the data values accurately. It is important to keep a record of any data source used for data presented only in graph or chart form, as a reference and the ability to illustrate how the data was queried and validated.

References

1. Zip Codes:

a. **When** you have longitude and latitude or street intersections and need the zip code go to: www.worldatlas.com/aatlas/latitude_and_longitude_finder.htm

Enter the latitude and longitude separated by a comma and hit submit. You can also enter street intersections then use the zip code for the city indicated.

b. Google accident sites ie. buildings, parks etc.

2. State Highway Crash Reports: www.mshp.dps.mo.gov/HP68/search/jsp

3. EMS reports: If the EMS, Emergency Medical Service, report is not available at record entry, the registrar can call, email, or fax a request for the report if the agency is known. If a report is faxed it should be to a secure location, preferably to the trauma department. Best practice for emailing of reports is by encryption of the email so access is controlled. In any event if there is a medical relationship between the two parties it is allowed by HIPAA to exchange information in a secure manner. EMS reports that are entered into the MOSTRA system may not appear online until up to three months after the incident due to the present quarterly state reporting requirement.

4. Atlas: An atlas of the state of Missouri detailed enough to see county lines and roads can help determine incident locations when a state highway report lists road intersects and mile markers. An atlas can be purchased in a convenience store, drugstore, or map store.

5. Google and Ask.com: The internet search engines are excellent resources for locations, anatomy, medical devices, injury description, procedure definitions etc.

6. NTDB® Google user group: The NTDB® Google user group is monitored by ATS, ACS, AIS, software companies, and trauma registrars, trauma coordinators, and program managers from all over the United States. Questions are posted and discussion threads followed concerning all facets of the trauma system in particular registry issues. When posting a request for assistance or a question one must take into consideration the source of answering posts and validate answers or guidance received. Usually the person posting also posts their

credentials and position or by what authority they are posting. This is not a social network and is not intended for one on one conversation but is supposed to be a venue providing professional information of value to the entire audience. There are several levels of participation that can be selected. Questions of a specific nature can be posted to the attention of those with expertise in a particular area of the trauma. Application to join can be made at the following website: www.ntdsdictionary.org

Drugs Used with Endotracheal Intubation (RSI) RSI is accomplished in stages the first being pretreatment then induction and paralysis, later post intubation. Each stage requires medications with specific pharmacological effects. These effects include sedation, analgesia, amnesic effects, anesthesia, anticholinergic effects to control secretions, and paralysis.
 Stage One Pretreatment: Oxygenation, use of Lidocaine, Fentanyl, Esmolol, and Atropine
 Stage Two Induction: Etomidate, Versed, Ketamine, Propofol, Thiopental, and Methohexital
 Stage Three Paralysis: Succinylcholine, Rocuronium, Mivacurium, and Pancuronium.

These are some of the drugs when given enroute by EMS or at a previous facility **would not be recorded as positive** if appearing as a positive result in a drug screen. The pain medications are prescription drugs that can also be used in a non prescribed abusive manner. (Some of the most commonly used are in **bold type**). This is not a complete list.

Table 1. Drugs Used in RSI

Sedatives	Paralytics	Barbiturates	Opiate Pain Medications
Etomidate (Amidate)	Vecuronium (Norcuron)	Thiopental	Oxycodone
	Recuronium (Zemuron)	Methohexital	Oxycontin
Ketamine (PCP)(Ketalar)	Succinylcholine (Anectine)		Morphine
Propofol (Diprivan)	Atracurium		Fentanyl
	Pancuronium		Codeine
Benzodiazepine Versed			Hydrocodone (Vicodin)
			Propoxyphene (Darvon)
			Hydromorphone (Dilaudid)
Local Anesthetic	<u>Beta Blocker</u>		Meperidine (Demerol)
Lidocaine	Esmolol		Sufentanil
			Alfentanil

Common Name Drug Categories

1. **Amphetamines/Methamphetamines**: Amphetamines, Methamphetamines, Phentermine, Ephedrine/Pseudoephedrine, Ecstasy (MDMA), MDA, and Phenylpropanolamine, Speed

MDA- Methylenedioxymethamphetamine

2. **Barbiturates**: Ambarbital, Butabarbital, Butalbital, Pentobarbital, Phenobarbital, Secobarbital

3. **Benzodiazapines**: Ativan, Librium, Xanax, Valium, Restoril, Versed

4. **Cannabinoids**: Marijuana (medical Marijuana with prescription would not be considered drug abuse with a positive drug screen, notation in record should be made)

5. **Cocaine Metabolites**: Cocaine

6. **Opiates and Opiate Combination Drugs**: 6-acetylmorphine, Codeine, Dihydrocodeine, **Heroin**, Hydrocodone, Hydromorphone, Morphine, Norcodeine, Oxymorphone, Oxycodone/Oxycontin, Darvocet, Demerol, Dilaudid, Fentanyl, Lorcet/Lortab, Methadone, Percocet/Percodan, Vicodin

7. **Phencyclidine**: PCP, Angel Dust

****Refer to the Missouri Drug Table for Drug Screen Drug Categories**

Missouri State Drug Tables for Trauma Registry Drug Screen Results-2011*				
Drug Category				
1 Cannabis	Marijuana, Dronabinaol, Marinol			
2 Cocaine	Cocaine			
3 PCP	Dextromethorphan(false positive)	Ketamine (false positive)		
4 Benzodiazepines	Alprazolam	Clonazepam	Midazolam	
	Amytriptyline	Clorazepate	Oxazepam	
	Librax	Chlordiazepoxide	Quazepam	
	Librium	Diazepam	Serax	
	Restoril	Doral	Temazepam	
	Valium	Estazolam	Tranxene	
	Xanax	Flurazepam	Triazolam	
	Clidinium	Halcion		
	Clobazam	Lorazepam		
5 Barbituates	Alagesic LQ	Butisol Sodium	Nembutal	Secobarbital
	Amobarbital	Cephadyn	Orbivan	Seconal
	Amytal	Dolgic Plus	Pentobarbital	Sedapap
	Anolor 300	Esgic and Esgic-Plus	Pentothal	Thiopental
	Ascomp with Codeine	Floracet or with Codeine	Phenobarbital	Zebutal
	Brevital	Florinal or with Codeine	Phrenilin	
	Bupap	Margesic	Phrenilin Forte	
	Butabarbital	Mephobarbital	Primodone	
	Butalbital combination with codeine	Methohexital	Promacet	
	Acetaminophen, Caffeine, Aspirin	Mysoline	Repan	
6 Amphetamines	Adderall and Adderall XR	Bupropion (false positive)		
	Amphetamine	Wellbutrin SR & XL (false positive)		
	Dextroamphetamine	Zyban (false positive)		
	Aplenzin (false positive)			
	Budeprion XL & SR (false positive)			
	Buproban (false positive)			
7	Opioids/ Narcotics			
Abstral	Fentanyl	Pentazocine		
Acetaminphen & Codeine or Tramadol		Pentazocine & Naloxone		
Actiq	Fentora	Percocet	Tylox	
Alfenta	Hydrocodone with other meds	Percodan	Ultiva	
Alfentanil	Hydromorphone	Phenylhistine DH	Ultracet	
Astramorph/PF	Ibudone	Primlev	Ultram	
Avinza	Infumorph 200 and 500	Promethazine and combo	Vicoprofen	
Buprenex	Kadian	Propoxyphene	Zutripo	
Buprenorphine	Buprenorphine and Naloxone	Pseudoephedrine, Dihydrocodeine, and Chlorpheniramine		
Butorphanol	Lazanda	Ratio-Cotridin		
Butrans	Capital and Codeine	Remifentanil		
Chlorpheniramine, Pseudoephedrine, and Codeine		Reprexain		
CoActifed	Levorphanol	Roxicet		
Codeine, Dihydrocodeine, Aspirin and Caffeine		Roxicodone		
Coldcough	Meperidine	Rybix ODT		
Coldcough PD	Methadone (will not show in USD)	Ryzolt		
Conzip	Methadose	Sublimaze		
Covan	Morphine	Suboxone		
Darvocet	Morphine and Naltrexone	Subutex		
Darvon	NS Contin	Sufenta		
Demerol	Nalbuphine	Sufentanil		
Dihydrocodeine, Chlorpheniramine, and Phenylephrine		Synalgos-DC		
DiHydro-CP	Novahistine DH	Talwin		
DiHydro-PE	Nucynta	Tapentadol		
Dilaudid	Onsolis	Tramadol		
Dolophine	Opana	Triprolidine, Pseudoephedrine, and Codeine		
Duragesic	Opium Tincture	Tusscough DHC		
Duramorph	Oramorph SR	TussiCaps		
Embeda	Oxycodone and combinations	Tussionex		
Endocet	Oxycontin	Tylenol with Codeine #3		
Endodan	Oxymorphone	Tylenol with Codeine #4		
Exalgo	Paregoric			
*Source - Barnes-Jewish Hospital Pharmacists				

Time Critical Diagnosis Stroke Center Registry Data Elements

The following data elements shall be entered into the stroke registry by Level I, II, III and IV stroke centers pursuant to 19 CSR 30-40.730. On pages two (2) through four (4), the bullet symbol is inserted into the columns (Levels I, II, III and/or IV) for the stroke centers that are required to enter that specific patient related data.

Level I and II Stroke Centers	Level III and IV Stroke Centers
Demographics	
First, middle and last name	First, middle and last name
Date of Birth	Date of Birth
Social Security Number	Social Security Number
Social Security Number Not Available	Social Security Number Not Available
Patient Zip Code	Patient Zip Code
Zip Code Not Available	Zip Code Not Available
Race	Race
Hispanic or Latino Ethnicity	Hispanic or Latino Ethnicity
Gender	Gender
Admission	
Level of Stroke Center for First Facility	Level of Stroke Center for First Facility
Symptom Onset Date/Time	Symptom Onset Date/Time
Symptom Time Estimated	Symptom Time Estimated
First Medical Contact Date and Time	First Medical Contact Date and Time
First Medical Contact Estimated	First Medical Contact Estimated
Means of Transport to First Facility	Means of Transport to First Facility
Date and Time of Arrival at First Facility	Date and Time of Arrival at First Facility
Admit Diagnosis	Admit Diagnosis
International Classification of Diseases, Ninth Revision (ICD-9) Principal Diagnosis	International Classification of Diseases, Ninth Revision (ICD-9) Principal Diagnosis
Discharge Diagnosis	Discharge Diagnosis
International Classification of Diseases, Ninth Revision (ICD-9) Other Diagnosis	International Classification of Disease, Ninth Revision (ICD-9) Other Diagnosis
Destination /Transferred To	Destination /Transferred To
Stroke Center Level	
Patient Arrival Date/Time at a Level I or II Stroke Center	Patient Arrival Date/Time at a Level III or IV Stroke Center
Patient Received From	
Patient Transferred from Outside Facility Date/Time	
Emergency Medical Service (EMS) Service	
Estimated Transfer Time of Patient	

	Missouri State Designation for each facility Participating in the patient's care Level I Stroke Center Level II Stroke Center Level III Stroke Center Level IV Stroke Center Non-participating Center			
Patient Specific Stroke Elements to Measure	I	II	III	IV
1. Documented Initial National Institutes of Health Stroke Scale (NIHSS) score within one (1) hour of hospital arrival	•			
2. Ischemic stroke	•	•	•	•
3. Hemorrhagic stroke	•	•	•	•
4. Thirty (30) day (greater than (>) twenty-one (21) days and less than (<) thirty-seven (37) days) Modified Rankin Scale (mRS) obtained via telephone or in-person and documented if ischemic stroke and received intravenous (IV) thrombolytic (t-PA) or endovascular recanalization procedure	•			
5. If an ischemic stroke, was intravenous (IV) thrombolytic given?	•			
6. If an ischemic stroke, was Intra-arterial (IA) pharmacologic thrombolytic given?	•			
7. If an ischemic stroke, was endovascular recanalization procedure done?	•			
8. Severity score documented for Subarachnoid Hemorrhage Stroke and Intracranial Hemorrhage Stroke within one (1) hour of hospital arrival	•			
9. Subarachnoid Hemorrhage Stroke	•			
10. Intracranial Hemorrhage Stroke	•			
11. If Intracranial Hemorrhage Stroke, was treatment to reverse International Normalized Ratio (INR) with procoagulant (e.g. fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates) initiated within two (2) hours (120 minutes) of hospital arrival?	•			
12. If Intracranial Hemorrhage stroke, was Intracranial Hemorrhage Stroke (INR) greater than (>) four (4)?	•			
13. Symptomatic intracranial hemorrhage (clinical deterioration greater than (>) four (4) point increase on National Institutes of Health Stroke Scale (NIHSS) and finding of parenchymal hematoma on Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) scan) within thirty-six (36) hours of onset of treatment with intravenous (IV) or Intra-arterial (IA) thrombolytic therapy, or endovascular reperfusion procedure	•			
14. Ruptured Aneurysmal Subarachnoid Hemorrhage	•			
15. If ruptured aneurysmal Subarachnoid Hemorrhage, was nimodipine treatment within twenty-four (24) hours of arrival at hospital?	•			
16. Was stroke or death within seven (7) days or discharge (if earlier) of comprehensive stroke procedure?	•			
17. Was selected comprehensive stroke procedure done?	•			
18. If ischemic or hemorrhagic stroke, was Venous Thromboembolism (VTE) prophylaxis given or documentation made why not given on the day of or the day after hospital admission?	•	•	•	•
19. Was ischemic stroke, antithrombotic therapy prescribed at discharge?	•	•	•	•

20. If ischemic stroke with atrial fibrillation/flutter, was anticoagulation therapy prescribed at discharge?	•	•	•	•
21. Ischemic stroke with documented atrial fibrillation/flutter	•	•	•	•
22. If acute ischemic stroke, was arrival at hospital within two (2) hours of time last known well and intravenous (IV) t-PA started within three (3) hours of time last known well?	•	•	•	•
23. If acute ischemic stroke, was arrival at hospital within two (2) hours (less than or equal to one hundred twenty (120) minutes) of time last known well?	•	•	•	•
24. If ischemic stroke, was antithrombotic therapy given by end of hospital day two (2)?	•	•	•	•
25. If ischemic stroke, is Low-density Lipoprotein (LDL) greater than (>) or equal to (=) one hundred (100) mg/dL?	•	•	•	•
26. If ischemic stroke, was patient on lipid-lowering medication prior to hospitalization?	•	•	•	•
27. If ischemic stroke patient, was Low-density Lipoprotein (LDL) not measured?	•	•	•	•
28. If ischemic stroke, was the patient prescribed statin medication therapy at discharge?	•	•	•	•
29. If ischemic or hemorrhagic stroke, was the patient discharged to home, homecare, or court/law enforcement?	•	•	•	•
30. If ischemic or hemorrhagic stroke patient, was documentation made that patient or caregiver was given educational material addressing activation of emergency medical system, follow-up after discharge, medications prescribed at discharge, risk factors for stroke, and warning signs and symptoms of stroke?	•	•	•	•
31. If ischemic or hemorrhagic stroke, was patient assessed for or received rehabilitative services?	•	•	•	•
32. If acute ischemic or hemorrhagic stroke patient arrived at Emergency Department (ED) within two (2) hours of time last known well, was head Computed Tomography (CT) or Magnetic Resonance Imaging (MRI) ordered?	•	•	•	
33. If acute ischemic or hemorrhagic stroke patient arrived at Emergency Department (ED) within two (2) hours of time last known well, was the time from Emergency Department (ED) arrival to head Computed Tomography (CT) interpretation within forty-five (45) minutes of arrival?	•	•	•	
34. If inter-hospital stroke patient transfer, was the patient admitted?	•	•		
35. Did the patient come following a request for transfer from an outside facility?	•	•		
36. If suspected stroke and arrival at hospital within two (2) hours of time last known well, was patient transferred to higher level hospital within sixty (60) minutes of Emergency Department (ED) arrival?				•
37. If ischemic stroke, is the patient eligible for thrombolytic?	•	•	•	
38. If suspected stroke, was patient arrival at hospital within two (2) hours of time last known well?				•
39. If ischemic stroke patient, did they present within the treatment window?	•	•	•	
40. If eligible ischemic stroke patient, were they treated with thrombolytics?	•	•	•	
41. Door to needle time	•	•	•	

42. If suspected acute stroke patient arrived within two (2) hours of time last known well, the time from Emergency Department (ED) arrival to stroke team assessment.		•	•	•
43. If suspected acute stroke patient arrived within two (2) hours of time last known well, the time from Emergency Department (ED) arrival to first contact with higher level hospital.		•	•	•
44. If patient came following a request for transfer, the time from sending hospital's first request for transfer to time receiving hospital provided notification to initiate transfer.	•	•		
45. Time from arrival to femoral artery puncture for intra-arterial (IA) thrombolytic infusion and mechanical recanalization therapy	•			

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**Level I TCD Stroke Center
QA Measures***
(Final and Approved by TCD QA Stroke Workgroup 11/9/2011)

* The information reported to the TCD registry will be used to generate these measures. These measures are not part of the filed regulations.

**Demographics: Patient name; Date of Birth; Gender; Race; Social Security (last four digits); Date(s) of Service; EMS Service;
Destination/Transferred To (primary and secondary)**

1. National Institutes of Health Stroke Scale (NIHSS) Score on Arrival
(References: TJC comprehensive stroke draft measure CSTK-1, BAC Metric 1)

Description: Ischemic stroke patients for whom an initial NIHSS score is documented

Setting: Inpatient

Rationale: A neurological examination of all patients presenting to the hospital emergency department with warning signs and symptoms of stroke should be a top priority and performed in a timely fashion. Use of a standardized stroke scale or scoring tool ensures that the major components of the neurological examination are evaluated. Clinical practice guidelines from the American Heart Association/American Stroke Association recommend The National Institutes of Health Stroke Scale (NIHSS) as the preferred scoring tool for this purpose. Scores obtained aid in the initial diagnosis of the patient, facilitate communication between healthcare professionals, and identify patient eligibility for various interventions and the potential for complications.

In addition to an initial score, evaluation should be repeated several times during the hospital stay, such as 24 hours after acute interventions and at discharge. Changes in the NIHSS score are a strong predictor of stroke outcome.

Numerator: Ischemic stroke patients for whom a NIHSS score is documented within one hour (< 60 minutes) of arrival at this hospital

Included: As above

Excluded: None

Denominator: Ischemic stroke patients

Included: As above

Excluded:

- Patients less than 18 years of age
- Patients admitted for Elective Carotid Intervention
- Patients discharged or transferred to another hospital within one hour of arrival at this hospital
- Patients who expired within one hour of arrival at this hospital
- Patients without warning signs and symptoms of stroke on arrival at this hospital

2. Modified Rankin Score (mRS) at 30 Days
(Reference: TJC comprehensive stroke draft measure CSTK-2, BAC 9)

Description: Ischemic stroke patients treated with IV thrombolytic (t-PA) or who undergo an endovascular recanalization procedure for whom a 30 day (> 21 days and < 37 days) mRS is obtained via telephone or in-person and documented

Setting: Inpatient

Rationale: The Modified Rankin Scale (mRS) is the accepted standard for assessing recovery post-stroke. As such, it has become the most widely used clinical outcome measure for stroke clinical trials. Scores are used to measure the degree of disability or dependence in activities of daily living. Score reliability and reproducibility are improved through use of a structured interview by a trained evaluator. Interviews may be conducted in-person or over the phone. According to guideline recommendations from the American Heart Association/American Stroke Association, standardized interviews to obtain a mRS score should be conducted for acute ischemic stroke patients treated with intravenous thrombolysis or acute endovascular recanalization at 3 months (90 days); however, recovery may continue well beyond 3 months for many ischemic stroke patients. Since the primary objective is collection of a mRS score or the attempt to collect a score at some point after discharge, data collection at 30 days may be more feasible (i.e., to increase the probability of data capture).

Numerator: Ischemic stroke patients treated with IV thrombolytic (t-PA) or who undergo an endovascular recanalization procedure for whom a 30 day (> 21 days and < 37 days) mRS is obtained via telephone or in-person and documented

Included: As above

Excluded: None

Denominator: Ischemic stroke patients treated with IV thrombolytic (t-PA) or who undergo an endovascular recanalization procedure

Included: As above

Excluded:

- Patients less than 18 years of age

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- Patients with a documented mRS of 5 any time prior to this hospital admission

3. Severity Measurement on Arrival

(Reference: TJC comprehensive stroke draft measure CSTK-3, BAC 12)

Description: Subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH) patients for whom an initial severity score [Hunt and Hess Scale, World Federation of Neurological Surgeons Score (WFNS), or the ICH Score] is documented

Setting: Inpatient

Rationale: Subarachnoid hemorrhage (SAH) and intracerebral hemorrhage (ICH) are medical emergencies requiring rapid diagnosis and assessment. Early deterioration is common in the first few hours after onset, and associated with increased mortality rates of > 75% compared to 30-day mortality rates of 35%-52%. More than half of all deaths from these conditions occur within the first two days. According to the American Heart Association/American Stroke Association, the severity of SAHs should be documented with an accepted grading scale, such as the Hunt and Hess Scale or the World Federation of Neurological Surgeons Scale, and the severity of ICHs should be documented with the ICH Score to capture the clinical state of the patient. The severity of initial neurological injury should be determined and documented in the emergency department because it is a useful predictor of outcome and helpful in planning future care with family and physicians.

Numerator: SAH and ICH stroke patients for whom a severity score is documented within one hour (< 60 minutes) of arrival at this hospital

Included: As above

Excluded: None

Denominator: SAH and ICH stroke patients

Included: As above

Excluded:

- Patients less than 18 years of age
- Patients discharged or transferred to another hospital within one hour of arrival at this hospital
- Patients who expired within one hour of arrival at this hospital
- Patients with traumatic brain injury (TBI), unruptured arteriovenous malformation (AVM), and non-traumatic subdural hematoma

4. International Normalized Ratio (INR) Reversal

(Reference: TJC comprehensive stroke draft measure CSTK-4, BAC 19)

Description: ICH stroke patients with an international normalized ratio (INR) > 1.4 for whom treatment with a procoagulant (e.g., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates) was initiated within 2 hours (120 minutes) of arrival at this hospital

Setting: Inpatient

Rationale: Intracerebral hemorrhage (ICH) is a life-threatening disorder. Patients receiving oral anticoagulants (OACs), as well as those with an acquired or congenital coagulopathy, are at increased risk for ICH and hemorrhagic expansion with warfarin-associated bleeds comprising 12% to 15% of all spontaneous hemorrhages. Prompt INR reversal with intravenous infusions of vitamin K and fresh-frozen plasma (FFP) has been historically recommended; however, normalization with prothrombin complex concentrates (PCCs) are increasingly recommended because several studies have shown that these agents can rapidly normalize the INR within minutes. Due to a lack of large, well-controlled, randomized trials, the American Society of Hematology has recommended against the routine use of recombinant factor VIIa (rFVIIa) and prothrombin complex concentrates for warfarin reversal.

Current guidelines from the American Heart Association/American Stroke Association recommend that patients with ICH whose INR is elevated due to OACs should have their warfarin withheld, receive therapy to replace vitamin K-dependent factors and correct the INR, and receive intravenous vitamin K. Although the risk of thrombotic complications appears relatively low, VTE prophylaxis using intermittent pneumatic compression (IPC) devices in addition to elastic stockings are recommended for these patients. Patients should also be monitored for signs and symptoms of fluid overload secondary to FFP administration.

Numerator: ICH stroke patients for whom treatment to reverse the INR with a procoagulant e.g., fresh frozen plasma, recombinant factor VIIa, prothrombin complex concentrates) was initiated within 2 hours (120 minutes) of arrival at this hospital

Included: As above

Excluded: None

Denominator: ICH stroke patients with an INR > 1.4

Included: As above

Excluded:

- Patients less than 18 years of age
- Patients with Comfort Measures Only documented on day of or after hospital arrival
- Patients enrolled in clinical trials
- Patients with procoagulant therapy initiated prior to hospital arrival
- Patients who expired within two hours of arrival at this hospital

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5. Hemorrhagic Complication

(Reference: TJC comprehensive stroke draft measure CSTK-5, BAC 7)

Description: Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (clinical deterioration > 4 point increase on NIHSS and finding of parenchymal hematoma on C or MRI scan) within 36 hours of the onset of treatment with IV or IA pharmacologic thrombolytic therapy, or endovascular reperfusion procedure

Setting: Inpatient

Rationale: Intravenous thrombolytic therapy (IV tPA) for acute ischemic stroke was approved by the US Food and Drug Administration in 1996, following findings from the National Institute of Neurological Disorders and Stroke (NINDS) trial which demonstrated favorable outcomes in 31% to 50% of patients treated with recombinant tissue plasminogen activator (r-tPA), as compared to 20% to 38% of patients treated with placebo. Intra-arterial thrombolytic therapy has shown favorable results in the Prolyse in Acute Cerebral Thromboembolism 2 (PROACT 2) and other trials and its use in select circumstances is recommended in AHA/ASA national guidelines. Intracranial hemorrhage is the major risk of thrombolytic therapy with similar rates reported for both IV and IA routes. The NINDS trial found that 6.4% of patients treated with IV r- tPA experienced symptomatic bleeding. Findings from the PROACT 2 study found the intracranial hemorrhage with neurological deterioration within 24 hours occurred in 10% patients treated with IA recombinant prourokinase. In addition to these agents, other available thrombolytic drugs include: streptokinase, p-anisoylated lys-plasminogen-streptokinase activator, and urokinase. Intracranial hemorrhage with neurological deterioration has also occurred in 8-11% of patients in multicenter studies of FDA-cleared endovascular recanalization devices.

The risk of intracranial hemorrhage in patients with ischemic stroke is greater than the risk of bleeding in patients who receive thrombolytic drugs for management of myocardial ischemia and may be increased in the presence of uncontrolled hypertension. Therefore, thrombolytic therapy is not recommended for patients with a pretreatment systolic blood pressure greater than 185 mm Hg or diastolic blood pressure greater than 110 mm Hg.

Numerator: Ischemic stroke patients who develop a symptomatic intracranial hemorrhage (clinical deterioration > 4 point increase on NIHSS and finding of parenchymal hematoma on CT or MRI scan) within 36 hours of the onset of treatment with IV or IA thrombolytic therapy, or endovascular reperfusion procedure

Included: As above

Excluded:

Denominator: Ischemic stroke patients treated with IV or IA pharmacologic thrombolytic therapy or who undergo an endovascular reperfusion procedure

Included: As above

Excluded:

- Patients admitted for Elective Carotid Intervention
- Patients with onset of treatment > 36 hours prior to hemorrhage
- Patients with CT finding of hemorrhage prior to IV or IA thrombolytic therapy
- Patients transferred following treatment performed prior to arrival at this hospital
- Patients transferred without consultation with the comprehensive stroke center following initiation of treatment

6. Nimodipine Treatment Initiated

(Reference: TJC comprehensive stroke draft measure CSTK-6, BAC 15)

Description: Ruptured aneurysmal subarachnoid hemorrhage (SAH) patients for whom nimodipine treatment was initiated within 24 hours of arrival at this hospital

Setting: Inpatient

Rationale: Cerebral vasospasm is a serious complication following SAH, occurring in 30% to 70% of patients and accounting for nearly 50% of the deaths in patients surviving to treatment. Constriction of the arterial lumen results in diminished cerebral perfusion distal to the affected artery, which produces a delayed neurological deficit that may progress to cerebral infarction without early management of the ruptured aneurysm. The arterial narrowing that occurs in cerebral vasospasm is typically a transient or temporary event, lasting from a few days up to 3 weeks.

The main goal of current treatment is to prevent or limit the severity of cerebral vasospasm. Only two treatments are generally accepted as proven and valuable for the prevention of ischemic stroke and reduction of ischemic complications:

- Treatment with cerebroselective calcium channel blocker nimodipine-Nimotop (60mg po q4h for 21 days after hemorrhage or hospital discharge within 21 days);
- Aggressive hypervolemic - hypertensive therapy with pressor agents and volume expansion (colloids) while monitoring the central venous pressure (CVP) or pulmonary capillary wedge pressure (PCWP), following early clipping of the aneurysm.

Numerator: Ruptured aneurysmal SAH patients for whom nimodipine treatment was initiated within 24 hours of arrival at this hospital.

Included: As above

Excluded: None

Denominator: Ruptured aneurysmal SAH patients

Included: As above

Excluded:

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- Patients less than 18 years of age
- Patients with Comfort Measures Only documented on day of or after hospital arrival
- Patients enrolled in clinical trials
- Patients who expired within 24 hours of arrival at this hospital
- Patients with a documented reason for not initiating nimodipine treatment

7. Median Time to Recanalization Therapy

(Reference: TJC comprehensive stroke draft measure CSTK-7, BAC 2)

Description: Median time from arrival to femoral puncture for intra-arterial (IA) thrombolytic infusion and mechanical recanalization therapy in acute ischemic stroke patients.

Setting: Inpatient

Rationale: Timely recanalization of an occluded intracerebral artery is a strong predictor of improved functional outcome and reduced mortality in patients with an acute ischemic stroke. At this time, administration of intravenous tissue plasminogen activator (IV-tPA) within three hours of time last known well remains the recommended first-line approach. However, the short therapeutic window and low rates of recanalization with IV t-PA has prompted the investigation of alternative approaches via intra-arterial infusion of a thrombolytic drug or mechanical recanalization with a device such as a Merci or Penumbra catheter. Since "time is brain", the overall speed of the recanalization process is an important and appropriate measure. In multicenter clinical trials of catheter therapies, the probability of good outcome decreased as time to angiographic reperfusion increased. To that end, comprehensive stroke centers are encouraged to strive for a goal of 90 minutes similar to recommendations in current cardiology guidelines for door-to-angioplasty time for acute myocardial infarction.

Continuous Variable Statement: Time (in minutes) from hospital arrival to femoral puncture for intra-arterial (IA) thrombolytic infusion and mechanical recanalization therapy in patients with acute ischemic stroke.

Included: As above

Excluded:

- Patients less than 18 years of age
- Patients admitted for Elective Carotid Intervention
- Patients discharged or transferred to another hospital within 90 minutes of arrival at this hospital
- Patients who expired within 90 minutes of arrival at this hospital

8. Stroke or Death Within 7 Days or Discharge If Earlier of a Comprehensive Stroke Procedure (Overall Rate)

(Reference: TJC comprehensive stroke draft measure CSTK-8, BAC 23)

Description: Patients with stroke or death within 7 days or discharge (if earlier) of a comprehensive stroke procedure

Setting: Inpatient

Rationale: This morbidity and mortality measure complements the existing CSC process of care measures. Risk-standardized morbidity and mortality rates (RSMMRs) can provide important additional information about quality of care that is not currently captured by the process measures and is currently unavailable to hospitals. Variation in mortality, after adjusting for case mix, may reflect differences in hospitals' general environments (such as coordination of care, patient safety policies, and staffing) or variation in care processes not measured in the current core measure set. Outcome measures can focus attention on a broader set of healthcare activities that affect patients' well being. Moreover, improving outcomes is the ultimate goal of quality improvement, and so the inclusion of outcomes measures assists in attaining improvement goals.

This measure is constructed to capture data associated with factors affecting the outcome for patients undergoing carotid endarterectomy (CEA), carotid artery stenting (CAS), endovascular embolectomy, aneurysm clipping and aneurysm embolization procedures, and unruptured aneurysms. Risk factors for each procedure or condition included in the comprehensive stroke population vary, as do rates for neurological and other complications. For example, the risk of stroke or death for patients undergoing CEA is related mainly to the patient's preoperative clinical status with higher rates noted for symptomatic versus asymptomatic patients (OR1.62; P<0.0001), hemispheric versus retinal symptoms (OR 2.31; P<0.001), urgent versus non-urgent operation (OR 4.9; P<0.001), and reoperation versus primary surgery (OR 1.95; P<0.018). On the other hand, McPhee and associates found the stroke rate for asymptomatic octogenarians undergoing CAS to be two-fold higher than that for CEA (i.e., 3% compared to 1%) with similar, low mortality rates for both procedures.

Numerator: Patients with stroke or death within 7 days or discharge (if earlier) of a comprehensive stroke procedure

Included: As above

Excluded: None

Denominator: All patients undergoing selected comprehensive stroke center procedures.

Included: Patients discharged from the hospital < 24 hours; Patients < 18 years of age

Excluded:

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- Patients with inconsistent or unknown mortality status or other unreliable data (e.g. date of death precedes admission date)
- Patients who were transferred from another acute care hospital or VA hospital (because the death is attributed to the hospital where the patient was initially admitted)
- Patients enrolled in the Medicare Hospice program any time in the 12 months prior to the index hospitalization including the first day of the index admission (since it is likely these patients are continuing to seek comfort measures only)
- Patients who were discharged against medical advice (AMA) (because providers did not have the opportunity to deliver full care and prepare the patient for discharge)
- Patients with admissions that were not the first hospitalization in the 30 days prior to death.

Measures collected by both Level I and Level II with TJC reference

1. Venous Thromboembolism (VTE) Prophylaxis

(Reference: TJC Primary Stroke STK-1)

Description: Ischemic and hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission. (Day 2 = day after Admission).

Numerator Statement: Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined.

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

2. Discharged on Antithrombotic Therapy

(Reference: TJC Primary Stroke Center STK-2)

Description: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing antithrombotic therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

3. Anticoagulation Therapy for Atrial Fibrillation/Flutter

(Reference: TJC Primary Stroke Center STK-3)

Description: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients with documented atrial fibrillation/flutter.

Included Populations:

- Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.
- Patients with documented atrial fibrillation/flutter

Excluded Populations:

- Patients discharged/transferred to another hospital

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- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

4. Thrombolytic Therapy Administered

(Reference: TJC Primary Stroke Center STK-4)

Description: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Numerator Statement: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Denominator Statement: Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded Populations:

- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*
- Time Last Known Well to arrival in the emergency department greater than 2 hours
- Patients with a documented reason for not initiating IV thrombolytic

5. Antithrombotic Therapy by End of Hospital Day Two

(Reference: JC Primary Stroke Center STK-5)

Metrics

Numerator: Patients with ischemic stroke who receive antithrombotic therapy by end of hospital day two

Denominator: All patients with ischemic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Duration of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged prior to the end of hospital day 2
- Patients with *IV OR IA Thrombolytic (t-PA) Therapy Administered at This Hospital or Within 24 Hours Prior to Arrival*
- Patients with a documented *Reason For Not Administering Antithrombotic Therapy By End Of Hospital Day 2*

6. Discharged on a Statin Medication

(Reference: TJC Primary Stroke Center STK-6)

Metrics

Numerator: Patients who are prescribed statin medication therapy at hospital discharge

Denominator: All ischemic stroke patients with an LDL \geq 100 mg/dL OR who were on a lipid-lowering medication prior to hospitalization OR LDL not measured

Included Populations:

- Patients with a diagnosis of ischemic stroke
- Patients with LDL \geq 100 mg/dL
- Patients with LDL not measured

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- Patients who were on cholesterol reducing therapy prior to hospitalization

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a *Reason For Not Prescribing Statin Medication at Discharge*

7. Stroke Education

(Reference: TJC Primary Stroke Center STK-8)

Metrics**Numerator:** Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following:

- Activation of emergency medical system
- Follow-up after discharge
- Medications prescribed at discharge
- Risk factors for stroke
- Warning signs and symptoms of stroke

Denominator:

- Patients with diagnosis of ischemic or hemorrhagic stroke discharged to home, homecare, or to court/law enforcement

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*

8. Assessed for Rehabilitation

(Reference: TJC Primary Stroke Center STK-10)

Metrics**Numerator:** Ischemic or hemorrhagic stroke patients assessed for or who received rehabilitation services**Denominator:** Ischemic or hemorrhagic stroke patients**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a length of stay greater than 120 days
- Patients Comfort measures Only documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients admitted for the performance of Elective Carotid Intervention

Additionally: These measures are collected by both Level I and II

1. **Median time from ED arrival to first contact with higher level hospital for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well.**

Clarification: The intent of this metric is to monitor the time that it takes to perform the acute assessment and call a higher level of hospital.

5/21/2012

2. **Head CT or MRI scan results for acute ischemic stroke or hemorrhagic stroke patients who received head CT or MRI interpretation within 45 minutes of ED arrival**

(Reference: CMS Manual Version 5, OQR Specifications OP-23)

Include: Patients seen in ED over the age of 18 with ICD-9-CM Principal Diagnosis Code for Acute Ischemic Stroke or Hemorrhagic Stroke

Numerator: Emergency Department acute ischemic stroke or hemorrhagic stroke patients arriving at the ED within 2 hours of time last known well, with an order for head CT or MRI scan whose time from ED arrival to interpretation of Head CT scan is within 45 minutes of arrival.

Denominator: Emergency Department Acute Stroke or Hemorrhagic Stroke patients arriving at the ED within 2 hours of the time last known well with an order for head CT or MRI scan.

~~3. **Percent of requested inter-hospital transfers for stroke patients who are admitted to this receiving hospital**~~

~~**Numerator:** Number of intra-hospital transferred stroke patients who are admitted~~

~~**Denominator:** Number of requests for intra-hospital transfers for stroke patients~~ 5/21/12 This measure will go on hold, Per Dr Lee and Dr Muzaffar conference call with Image Trend

4. **Inter-hospital transfers: Median time from sending hospital's first request to transfer, to time this receiving hospital provided notification to initiate transport**

These measures are collected by Levels I, II, III

1. **Percent of patients presenting within treatment window**

Numerator: Number of ischemic stroke patients presenting within treatment window

Denominator: Total number of ischemic stroke patients

2. **Percent of eligible patients treated with thrombolytic**

Numerator: Number of eligible ischemic stroke patients who received thrombolytic

Denominator: Total number of ischemic stroke patients who were eligible for thrombolytic

2/17/2012

**Level II TCD Stroke Center
QA Measures***

(Final and Approved by TCD QA Stroke Workgroup 11/9/2011)

* The information reported to the TCD registry will be used to generate these measures. These measures are not part of the filed regulations.

Demographics: Patient name; Date of Birth; Gender; Race; Social Security (last four digits); Date(s) of Service; EMS Service; Destination/Transferred To (primary and secondary)

1. Venous Thromboembolism (VTE) Prophylaxis

(Reference: TJC Primary Stroke STK-1)

Description: Ischemic and hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission. (Day 2 = day after Admission).

Numerator Statement: Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined.

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

2. Discharged on Antithrombotic Therapy

(Reference: TJC Primary Stroke Center STK-2)

Description: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing antithrombotic therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

3. Anticoagulation Therapy for Atrial Fibrillation/Flutter

(Reference: TJC Primary Stroke Center STK-3)

Description: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients with documented atrial fibrillation/flutter.

Included Populations:

- Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.
- Patients with documented atrial fibrillation/flutter

Excluded Populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age

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- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

4. Thrombolytic Therapy Administered

(Reference: TJC Primary Stroke Center STK-4)

Description: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Numerator Statement: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Denominator Statement: Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded Populations:

- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*
- Time Last Known Well to arrival in the emergency department greater than 2 hours
- Patients with a documented reason for not initiating IV thrombolytic

5. Antithrombotic Therapy by End of Hospital Day Two

(Reference: JC Primary Stroke Center STK-5)

Metrics

Numerator: Patients with ischemic stroke who receive antithrombotic therapy by end of hospital day two

Denominator: All patients with ischemic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Duration of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged prior to the end of hospital day 2
- Patients with *IV OR IA Thrombolytic (t-PA) Therapy Administered at This Hospital or Within 24 Hours Prior to Arrival*
- Patients with a documented *Reason For Not Administering Antithrombotic Therapy By End Of Hospital Day 2*

6. Discharged on a Statin Medication

(Reference: JC Primary Stroke Center STK-6)

Metrics

Numerator: Patients who are prescribed statin medication therapy at hospital discharge

Denominator: All ischemic stroke patients with an LDL \geq 100 mg/dL OR who were on a lipid-lowering medication prior to hospitalization OR LDL not measured

Included Populations:

- Patients with a diagnosis of ischemic stroke
- Patients with LDL \geq 100 mg/dL
- Patients with LDL not measured
- Patients who were on cholesterol reducing therapy prior to hospitalization

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days

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- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a *Reason For Not Prescribing Statin Medication at Discharge*

7. Stroke Education

(Reference: JC Primary Stroke Center STK-8)

Metrics

Numerator: Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following:

- Activation of emergency medical system
- Follow-up after discharge
- Medications prescribed at discharge
- Risk factors for stroke
- Warning signs and symptoms of stroke

Denominator:

- Patients with diagnosis of ischemic or hemorrhagic stroke discharged to home, homecare, or to court/law enforcement

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*

8. Assessed for Rehabilitation

(Reference: JC Primary Stroke Center STK-10)

Metrics

Numerator: Ischemic or hemorrhagic stroke patients assessed for or who received rehabilitation services

Denominator: Ischemic or hemorrhagic stroke patients

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a length of stay greater than 120 days
- Patients *Comfort measures Only* documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients admitted for the performance of *Elective Carotid Intervention*

Additionally:

1. Median time from ED arrival to stroke team assessment for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well

Clarification: The intent of this metric is to monitor the time that it takes for the initial medical contact with patient.

2. Median time from ED arrival to first contact with higher level hospital for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well.

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Clarification: The intent of this metric is to monitor the time that it takes to perform the acute assessment and call a higher level of hospital.

3. **Head CT or MRI scan results for acute ischemic stroke or hemorrhagic stroke patients who received head CT or MRI interpretation within 45 minutes of ED arrival**

(Reference: CMS Manual Version 5, OQR Specifications OP-23)

Include: Patients seen in ED over the age of 18 with ICD-9-CM Principal Diagnosis Code for Acute Ischemic Stroke or Hemorrhagic Stroke

Numerator: Emergency Department acute ischemic stroke or hemorrhagic stroke patients arriving at the ED within 2 hours of time last know well, with an order for head CT or MRI scan whose time from ED arrival to interpretation of Head CT scan is within 45 minutes of arrival.

Denominator: Emergency Department Acute Stroke or Hemorrhagic Stroke patients arriving at the ED within 2 hours of the time last known well with an order for head CT or MRI scan.

4. **Percent of requested inter-hospital transfers for stroke patients who are admitted to this receiving hospital**

Numerator: Number of intra-hospital transferred stroke patients who are admitted

Denominator: Number of requests for intra-hospital transfers for stroke patients

5. **Inter-hospital transfers: Median time from sending hospital's first request to transfer, to time this receiving hospital provided notification to initiate transport**

These measures are collected by Levels I, II, III

1. **Percent of patients presenting within treatment window**

Numerator: Number of ischemic stroke patients presenting within treatment window

Denominator: Total number of ischemic stroke patients

2. **Percent of eligible patients treated with thrombolytic**

Numerator: Number of eligible ischemic stroke patients who received thrombolytic

Denominator: Total number of ischemic stroke patients who were eligible for thrombolytic

2/17/2012

**Level III TCD Stroke Center
QA Measures***

(Final and Approved by the TCD QA Stroke Workgroup 11/9/2011)

* The information reported to the TCD registry will be used to generate these measures. These measures are not part of the filed regulations.

Demographics: Patient name; Date of Birth; Gender; Race; Social Security (last four digits); Date(s) of Service; EMS Service; Destination/Transferred To (primary and secondary)

1. Median time from ED arrival to stroke team assessment for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well

Clarification: The intent of this metric is to monitor the time that it takes for the initial medical contact with patient.

2. Median time from ED arrival to first contact with higher level hospital for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well.

Clarification: The intent of this metric is to monitor the time that it takes to perform the acute assessment and call a higher level of hospital.

3. Percent of acute ischemic stroke or hemorrhagic stroke patients who received head CT or MRI interpretation within 45 minutes of ED arrival

(Reference: CMS Manual Version 5, OQR Specifications OP-23)

Include: Patients seen in ED over the age of 18 with ICD-9-CM Principal Diagnosis Code for Acute Ischemic Stroke or Hemorrhagic Stroke

Numerator: Emergency Department acute ischemic stroke or hemorrhagic stroke patients arriving at the ED within 2 hours of time last known well, with an order for head CT or MRI scan whose time from ED arrival to interpretation of Head CT scan is within 45 minutes of arrival.

Denominator: Emergency Department Acute Stroke or Hemorrhagic Stroke patients arriving at the ED within 2 hours of the time last known well with an order for head CT or MRI scan.

4. Thrombolytic Therapy Administered

(Reference: TJC Primary Stroke Center STK-4)

Description: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Numerator: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Denominator: Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded Populations:

- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*
- Time Last Known Well to arrival in the emergency department greater than 2 hours
- Patients with a documented reason for not initiating IV thrombolytic

5. Percentage of suspected acute ischemic stroke patients who received tPA whose time of departure (for transfer to higher level hospital) is within 90 minutes of arrival

Numerator: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well whose time of departure is within 90 minutes of arrival

Denominator: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well

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Clarification:

- For suspected stroke patients in the hospital, the time of arrival should be taken to be the time that the deficit was first discovered.

Only when a stroke patient is admitted will Level III Stroke Centers report the following measures regarding that patient:

1. Venous Thromboembolism (VTE) Prophylaxis

(Reference: TJC Primary Stroke STK-1)

Description: Ischemic and hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission. (Day 2 = day after Admission).

Numerator Statement: Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined.

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

2. Discharged on Antithrombotic Therapy

(Reference: TJC Primary Stroke Center STK-2)

Description: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing antithrombotic therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

3. Anticoagulation Therapy for Atrial Fibrillation/Flutter

(Reference: TJC Primary Stroke Center STK-3)

Description: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients with documented atrial fibrillation/flutter.

Included Populations:

- Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.
- Patients with documented atrial fibrillation/flutter

Excluded Populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age

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- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

4. Thrombolytic Therapy Administered

(Reference: TJC Primary Stroke Center STK-4)

This measure is listed on previous page to be collected and reported for all Level III acute stroke patients.

5. Antithrombotic Therapy by End of Hospital Day Two

(Reference: JC Primary Stroke Center STK-5)

Metrics

Numerator: Patients with ischemic stroke who receive antithrombotic therapy by end of hospital day two

Denominator: All patients with ischemic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke

Excluded Populations:

1. Patients less than 18 years of age
2. Patients who have a Duration of Stay less than 2 days
3. Patients who have a Length of Stay greater than 120 days
4. Patients with *Comfort Measures Only* documented on day of or day after arrival
5. Patients enrolled in clinical trials
6. Patients admitted for *Elective Carotid Intervention*
7. Patients discharged prior to the end of hospital day 2
8. Patients with *IV OR IA Thrombolytic (t-PA) Therapy Administered at This Hospital or Within 24 Hours Prior to Arrival*
9. Patients with a documented *Reason For Not Administering Antithrombotic Therapy By End Of Hospital Day 2*

6. Discharged on a Statin Medication

(Reference: JC Primary Stroke Center STK-6)

Metrics

Numerator: Patients who are prescribed statin medication therapy at hospital discharge

Denominator: All ischemic stroke patients with an LDL \geq 100 mg/dL OR who were on a lipid-lowering medication prior to hospitalization OR LDL not measured

Included Populations:

- Patients with a diagnosis of ischemic stroke
- Patients with LDL \geq 100 mg/dL
- Patients with LDL not measured
- Patients who were on cholesterol reducing therapy prior to hospitalization

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a *Reason For Not Prescribing Statin Medication at Discharge*

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7. Stroke Education

(Reference: JC Primary Stroke Center STK-8)

Metrics**Numerator:** Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following:

- Activation of emergency medical system
- Follow-up after discharge
- Medications prescribed at discharge
- Risk factors for stroke
- Warning signs and symptoms of stroke

Denominator:

- Patients with diagnosis of ischemic or hemorrhagic stroke discharged to home, homecare, or to court/law enforcement

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*

8. Assessed for Rehabilitation

(Reference: JC Primary Stroke Center STK-10)

Metrics**Numerator:** Ischemic or hemorrhagic stroke patients assessed for or who received rehabilitation services**Denominator:** Ischemic or hemorrhagic stroke patients**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a length of stay greater than 120 days
- Patients Comfort measures Only documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care

Patients admitted for the performance of Elective Carotid Intervention

These measures are collected by Levels I, II, III**1. Percent of patients presenting within treatment window****Numerator:** Number of ischemic stroke patients presenting within treatment window**Denominator:** Total number of ischemic stroke patients**2. Percent of eligible patients treated with thrombolytic****Numerator:** Number of eligible ischemic stroke patients who received thrombolytic**Denominator:** Total number of ischemic stroke patients who were eligible for thrombolytic

**Level IV TCD Stroke Center
QA Measures***

(Final and Approved by TCD QA Stroke Workgroup 11/9/2011)

* *The information reported to the TCD registry will be used to generate these measures. These measures are not part of the filed regulations.*

Demographics: *Patient name; Date of Birth; Gender; Race; Social Security (last four digits); Date(s) of Service; EMS Service; Destination/Transferred To (primary and secondary)*

1. Median time from ED arrival to stroke team assessment for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well

Clarification: The intent of this metric is to monitor the time that it takes for the initial medical contact with patient.

2. Median time from ED arrival to first contact with higher level hospital for all suspected acute stroke patients who arrive at this hospital within 2 hours of time last known well

Clarification: The intent of this metric is to monitor the time that it takes to perform the acute assessment and call a higher level of hospital.

3. Percentage of suspected stroke patients who arrived within 2 hours time last known well, whose time of departure (for transfer to higher level hospital) is within 60 minutes of arrival to Emergency Department.

Numerator: Suspected stroke patients who arrived within 2 hours of time last known well whose time of transfer to higher level hospital is within 60 minutes of arrival to Emergency Department.

Denominator: Suspected stroke patients who arrived within 2 hours of time last known well

Include: All suspected stroke patients in the hospital

Clarification:

- Time of arrival should be taken to be the time the patient first arrives at ED.
- For inpatients with suspected stroke, time of arrival is to be the time that the deficit was first discovered.

Only when a stroke patient is admitted will the Level IV Stroke Centers report the following measures regarding that patient:

1. Venous Thromboembolism (VTE) Prophylaxis
(Reference: TJC Primary Stroke STK-1)

Description: Ischemic and hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given the day of or the day after hospital admission. (Day 2 = day after Admission).

Numerator Statement: Ischemic or hemorrhagic stroke patients who received VTE prophylaxis or have documentation why no VTE prophylaxis was given on the day of or the day after hospital admission.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic or hemorrhagic stroke as defined.

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures* Only documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

2. Discharged on Antithrombotic Therapy
(Reference: TJC Primary Stroke Center STK-2)

Description: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients prescribed antithrombotic therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing antithrombotic therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

3. Anticoagulation Therapy for Atrial Fibrillation/Flutter

(Reference: TJC Primary Stroke Center STK-3)

Description: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Numerator Statement: Ischemic stroke patients with atrial fibrillation/flutter who are prescribed anticoagulation therapy at hospital discharge.

Denominator Statement: Ischemic stroke patients with documented atrial fibrillation/flutter.

Included Populations:

- Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.
- Patients with documented atrial fibrillation/flutter

Excluded Populations:

- Patients discharged/transferred to another hospital
- Patients who expired
- Patients who left against medical advice
- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*

4. Thrombolytic Therapy Administered

(Reference: TJC Primary Stroke Center STK-4)

Description: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Numerator Statement: Acute ischemic stroke patients who arrive at this hospital within 2 hours of time last known well and for whom IV t-PA was initiated at this hospital within 3 hours of time last known well.

Denominator Statement: Acute ischemic stroke patients whose time of arrival is within 2 hours (less than or equal to 120 minutes) of time last known well.

Included Populations: Discharges with an ICD-9-CM Principal Diagnosis Code for ischemic stroke as defined.

Excluded Populations:

- Patients discharged to hospice (home or facility)
- Patients with a documented reason for not prescribing anticoagulation therapy at discharge.
- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after hospital arrival
- Patients enrolled in clinical trials
- Patients admitted solely for *Elective Carotid Intervention*
- Time Last Known Well to arrival in the emergency department greater than 2 hours
- Patients with a documented reason for not initiating IV thrombolytic

5. Antithrombotic Therapy by End of Hospital Day Two

(Reference: JC Primary Stroke Center STK-5)

Metrics

Numerator: Patients with ischemic stroke who receive antithrombotic therapy by end of hospital day two

Denominator: All patients with ischemic stroke

Included Populations:

- Patients with a diagnosis of ischemic stroke

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Duration of Stay less than 2 days
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented on day of or day after arrival
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged prior to the end of hospital day 2
- Patients with *IV OR IA Thrombolytic (t-PA) Therapy Administered at This Hospital or Within 24 Hours Prior to Arrival*
- Patients with a documented *Reason For Not Administering Antithrombotic Therapy By End Of Hospital Day 2*

6. Discharged on a Statin Medication

(Reference: JC Primary Stroke Center STK-6)

Metrics

Numerator: Patients who are prescribed statin medication therapy at hospital discharge

Denominator: All ischemic stroke patients with an LDL \geq 100 mg/dL OR who were on a lipid-lowering medication prior to hospitalization OR LDL not measured

Included Populations:

- Patients with a diagnosis of ischemic stroke
- Patients with LDL \geq 100 mg/dL
- Patients with LDL not measured
- Patients who were on cholesterol reducing therapy prior to hospitalization

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients with a *Reason For Not Prescribing Statin Medication at Discharge*

7. Stroke Education

(Reference: JC Primary Stroke Center STK-8)

Metrics

Numerator: Ischemic or hemorrhagic stroke patients with documentation that they or their caregivers were given educational material addressing all of the following:

- Activation of emergency medical system
- Follow-up after discharge
- Medications prescribed at discharge
- Risk factors for stroke
- Warning signs and symptoms of stroke

Denominator:

- Patients with diagnosis of ischemic or hemorrhagic stroke discharged to home, homecare, or to court/law enforcement

Excluded Populations:

- Patients less than 18 years of age
- Patients who have a Length of Stay greater than 120 days
- Patients with *Comfort Measures Only* documented
- Patients enrolled in clinical trials
- Patients admitted for *Elective Carotid Intervention*

8. Assessed for Rehabilitation

(Reference: JC Primary Stroke Center STK-10)

Metrics**Numerator:** Ischemic or hemorrhagic stroke patients assessed for or who received rehabilitation services**Denominator:** Ischemic or hemorrhagic stroke patients**Excluded Populations:**

- Patients less than 18 years of age
- Patients who have a length of stay greater than 120 days
- Patients Comfort measures Only documented
- Patients enrolled in clinical trials
- Patients discharged to another hospital
- Patients who left against medical advice
- Patients who expired
- Patients discharged to home for hospice care
- Patients discharged to a health care facility for hospice care
- Patients admitted for the performance of Elective Carotid Intervention

**Time Critical Diagnosis ST Segment Elevation Myocardial
Infarction (STEMI) Center Registry Data Elements**

The following data elements shall be entered into the STEMI registry by Level I, II, III and IV STEMI centers pursuant to 19 CSR 30-40.760.

Level I and II STEMI Centers	Only For Level III STEMI Centers which are Performing Percutaneous Coronary Interventions (PCIs) (Only on Patients Receiving Percutaneous Coronary Interventions (PCIs)) ¹	Level III STEMI Centers which are not performing Percutaneous Coronary Interventions (PCIs) and Level IV STEMI Centers
Date	Date	Date
First, middle and last name	First, middle and last name	First, middle and last name
Date of Birth	Date of Birth	Date of Birth
Social Security Number	Social Security Number	Social Security Number
Destination/Transferred to Primary Facility Secondary Facility	Destination/Transferred to Primary Facility Secondary Facility	Destination/Transferred to Primary Facility Secondary Facility
Emergency Medical Service (EMS) Service	Emergency Medical Service (EMS) Service	Emergency Medical Service (EMS) Service
Patient Zip Code	Patient Zip Code	Patient Zip code
Race	Race	Race
Hispanic or Latino Ethnicity	Hispanic or Latino Ethnicity	Hispanic or Latino Ethnicity
Gender	Gender	Gender
Admit Source (Emergency Department (ED) versus transfer from another facility)	Admit Source (Emergency Department (ED) versus transfer from another facility)	
Admit Diagnosis	Admit Diagnosis	International Classification of diseases, Ninth Revision (ICD-9) Principal Diagnosis
Discharge Diagnosis	Discharge Diagnosis	International Classification of diseases, Ninth Revision (ICD-9) Other Diagnosis
Cardiogenic Shock at time of presentation	Cardiogenic Shock at time of presentation	
Heart Failure at time of presentation	Heart Failure at time of presentation	
Myocardial Infarction at time of presentation	Myocardial Infarction at time of presentation	
Cocaine Use at time of presentation	Cocaine Use at time of presentation	
Illicit Drug Use at time of	Illicit Drug Use at time of	

¹ Level III STEMI Centers which perform Percutaneous Coronary Interventions (PCIs) shall only enter data in the middle column if the patient(s) the Level III STEMI Center is entering data about received a Percutaneous Coronary Intervention (PCI) at that Level III STEMI Center. If the patient(s) did not receive Percutaneous Coronary Interventions (PCIs) at that Level III STEMI Center, then the Level III STEMI Center which performs Percutaneous Coronary Interventions (PCIs) shall enter data in the right column for those patients.

presentation	presentation	
Cardiac Arrest at time of presentation, pre-hospital, outside facility	Cardiac Arrest at time of presentation, pre-hospital, outside facility	
Heart Rate	Heart Rate	Heart Rate
Systolic Blood Pressure	Systolic Blood Pressure	Systolic Blood Pressure
Medications		
Aspirin at arrival	Aspirin at arrival	Aspirin at arrival
Aspirin at Discharge	Aspirin at Discharge	
Ace Inhibitor/Angiotensin II Receptor Blocker at Discharge	Ace Inhibitor/Angiotensin II Receptor Blocker at Discharge	
Beta Blocker at Discharge	Beta Blocker at Discharge	
Acute Oral Antiplatelet	Acute Oral Antiplatelet	
Adenosine Dephosphate Receptor Inhibitor (ADP) receptor at arrival	Adenosine Dephosphate Receptor Inhibitor (ADP) receptor at arrival	
Adenosine Dephosphate Receptor Inhibitor (ADP) receptor at Discharge	Adenosine Dephosphate Receptor Inhibitor (ADP) receptor at Discharge	
Aldosterone Blocker at Discharge	Aldosterone Blocker at Discharge	
Acute Beta Blocker	Acute Beta Blocker	Acute Beta Blocker
Acute Ace Inhibitor/Angiotensin II Receptor Blocker	Acute Ace Inhibitor/Angiotensin II Receptor Blocker	Acute Ace Inhibitor/Angiotensin II Receptor Blocker
Anticoagulant	Anticoagulant	
Glycoprotein IIb/IIIa Inhibitor	Glycoprotein IIb/IIIa Inhibitor	
Fibrinolytic administered	Fibrinolytic administered	Fibrinolytic administered
Statin	Statin	
Co-morbidities		
Hypertension	Hypertension	
Pulmonary Artery Disease	Pulmonary Artery Disease	
Weight	Weight	
Height	Height	
Body Mass Index (BMI)	Body Mass Index (BMI)	
Dyslipidemia	Dyslipidemia	
Smoker	Smoker	
Prior Stroke	Prior Stroke	
Cerebrovascular Accident (CVA)/Cerebral Vascular Disease	Cerebrovascular Accident (CVA)/Cerebral Vascular Disease	
Current Dialysis	Current Dialysis	
Chronic Lung Disease	Chronic Lung Disease	
Prior Myocardial Infarction (MI)	Prior Myocardial Infarction (MI)	
Prior Heart Failure	Prior Heart Failure	
Prior Percutaneous Coronary Intervention (PCI)	Prior Percutaneous Coronary Intervention (PCI)	
Prior Coronary Artery Bypass Graft (CABG)	Prior Coronary Artery Bypass Graft (CABG)	

Prior valve surgery	Prior valve surgery	
Family history of premature Coronary Artery Disease (CAD)	Family history of premature Coronary Artery Disease (CAD)	
Atrial fibrillation/flutter (optional)	Atrial fibrillation/flutter (optional)	
Pacer/Internal Cardiac Defibrillator (optional)	Pacer/Internal Cardiac Defibrillator (optional)	
Persistent symptoms of ischemia	Persistent symptoms of ischemia	
Process		
Level of STEMI center for first facility	Level of STEMI center for first facility	
Location of 1 st Evaluation (Emergency Department, In-Patient, Field)	Location of 1 st Evaluation (Emergency Department, In-Patient, Field)	Location of 1 st Evaluation (Emergency Department, In-Patient, Field)
Electrocardiogram (ECG)	Electrocardiogram (ECG)	Electrocardiogram (ECG)
Initial Electrocardiogram (ECG) Interpretation	Initial Electrocardiogram (ECG) Interpretation	Initial Electrocardiogram (ECG) Interpretation
Patient transferred for Percutaneous Coronary Intervention (PCI)	Patient transferred for Percutaneous Coronary Intervention (PCI)	
Means of transfer	Means of transfer	
Patient transferred for Coronary Artery Bypass Graft (CABG)	Patient transferred for Coronary Artery Bypass Graft (CABG)	Probable Cardiac Chest Pain
Emergency Department (ED) presentation at referring facility	Emergency Department (ED) presentation at referring facility	Transfer for acute coronary intervention
Means of transport to first facility	Means of transport to first facility	
Non-system reason for delay to Percutaneous Coronary Intervention (PCI)	Non-system reason for delay to Percutaneous Coronary Intervention (PCI)	
Clinical Trial	Clinical Trial	
Comfort Measures	Comfort Measures	
Low-density Lipoprotein (LDL) less than 100	Low-density Lipoprotein (LDL) less than 100	
Left Ventricular Systolic Dysfunction	Left Ventricular Systolic Dysfunction	
Party which activates the hospital STEMI team	Party which activates the hospital STEMI team	
Non-system reason for delay in lytic therapy	Non-system reason for delay in lytic therapy	Reason for delay in lytic therapy
Reason no Ace Inhibitor/Angiotensin II Receptor Blocker at discharge	Reason no Ace Inhibitor/Angiotensin II Receptor at discharge	
Reason no aspirin at arrival	Reason no aspirin at arrival	Reason for no aspirin at arrival
Reason no aspirin at discharge	Reason no aspirin at discharge	
Reason no Beta Blocker at discharge	Reason no Beta Blocker at discharge	
Reason no Statin at discharge	Reason no Statin at discharge	
Time		

Arrival Date and Time at Cardiovascular (CV) lab	Arrival Date and Time at Cardiovascular (CV) lab	Out-Patient Encounter Date/Arrival time
Arrival at outside facility date and time	Arrival at outside facility date and time	
Symptom Onset Date and Time	Symptom Onset Date and Time	Symptom Onset Date and Time
Symptom Time estimated	Symptom Time estimated	Symptom Time estimated
First medical contact date and time	First medical contact date and time	First medical contact date and time
First Electrocardiogram (ECG) Date and Time	First Electrocardiogram (ECG) Date and Time	First Electrocardiogram (ECG) Date and Time
STEMI or STEMI equivalent first noticed	STEMI or STEMI equivalent first noticed	STEMI or STEMI equivalent first noticed
Fibrinolytic administered	Fibrinolytic administered	Fibrinolytic administered
Fibrinolytic Date and Time	Fibrinolytic Date and Time	Fibrinolytic Date and Time
Thrombolytic non-system delay	Thrombolytic non-system delay	Thrombolytic non-system delay
First door in; first door out	First door in; first door out	Reason for not administering a fibrinolytic
Cardiovascular (CV) Lab yes/no level	Cardiovascular (CV) Lab yes/no level	
First device Date and Time	First device Date and Time	
Coronary Artery Bypass Graft (CABG) Date and Time	Coronary Artery Bypass Graft (CABG) Date and Time	
Discharge Date	Discharge Date	Discharge Date and Time
Discharge Status	Discharge Status	Discharge Status
Procedure		
Reperfusion strategy – thrombolytics, Percutaneous Coronary Intervention (PCI), Coronary Artery Bypass Graft (CABG) or not revascularized and reason	Reperfusion strategy – thrombolytics, Percutaneous Coronary Intervention (PCI), Coronary Artery Bypass Graft (CABG) or not revascularized and reason	
STEMI or STEMI equivalent	STEMI or STEMI equivalent	
Patient is reperfusion candidate?	Patient is reperfusion candidate?	
International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9- CM) Principal Procedural Code	International Classification of Diseases, Ninth Revision, Clinical Modification (ICD-9- CM) Principal Procedural Code	
Percutaneous Coronary Intervention (PCI) Indication	Percutaneous Coronary Intervention (PCI) Indication	
Non-primary Percutaneous Coronary Intervention (PCI)	Non-primary Percutaneous Coronary Intervention (PCI)	
Primary Percutaneous Coronary Intervention (PCI)	Primary Percutaneous Coronary Intervention (PCI)	
Reason for delay in Percutaneous Coronary Intervention (PCI)	Reason for delay in Percutaneous Coronary Intervention (PCI)	

Labs		
Troponin – initial and peak	Troponin – initial and peak	
Pre & Post Creatine Kinase	Pre & Post Creatine Kinase	
Lipids	Lipids	
Pre & Post hemoglobin	Pre & Post hemoglobin	
Hemoglobin A1c	Hemoglobin A1c	
Creatinine	Creatinine	
In hospital Clinical Events		
Unadjusted mortality rate	Unadjusted mortality rate	
Risk Adjusted Mortality	Risk Adjusted Mortality	
Cardiogenic Shock developed after STEMI	Cardiogenic Shock developed after STEMI	
Cardiac Arrest	Cardiac Arrest	
Heart Failure developed after STEMI	Heart Failure developed after STEMI	
Stroke developed after STEMI	Stroke developed after STEMI	
Vascular Access Site Injury	Vascular Access Site Injury	
Emergent Coronary Artery Bypass Graft (CABG) due to complication from STEMI or Percutaneous Coronary Intervention (PCI)	Emergent Coronary Artery Bypass Graft (CABG) due to complication from STEMI or Percutaneous Coronary Intervention (PCI)	
Post Procedure Care		
Cardiac Rehab Referral	Cardiac Rehab Referral	
Smoking Cessation Advice	Smoking Cessation Advice	
Dietary Modification	Dietary Modification	
Exercise Counseling	Exercise Counseling	
Medication Education	Medication Education	
Performance Improvement		
The time from first medical contact or pre-hospital Electrocardiogram (ECG) STEMI identification to hospital door to device or balloon time	The time from first medical contact or pre-hospital Electrocardiogram (ECG) STEMI identification to hospital door to device or balloon time	
Time from first medical contact or pre-hospital Electrocardiogram (ECG) STEMI identification to hospital door or needle time (thrombolytic administration time)	Time from first medical contact or pre-hospital Electrocardiogram (ECG) STEMI identification to hospital door or needle time (thrombolytic administration time)	Time from first medical contact or pre-hospital Electrocardiogram (ECG) STEMI identification to hospital door or needle time (thrombolytic administration time)
Did the STEMI patient present within the treatment window for percutaneous coronary interventions and/or thrombolytic administration	Did the STEMI patient present within the treatment window for percutaneous coronary interventions and/or thrombolytic administration	Did the STEMI patient present within the treatment window for percutaneous coronary interventions and/or thrombolytic administration
Is this a STEMI patient	Is this a STEMI patient	Is this a STEMI patient

If eligible, was the STEMI patient treated with percutaneous coronary intervention and/or thrombolytic	If eligible, was the STEMI patient treated with percutaneous coronary intervention and/or thrombolytic	If eligible, was the STEMI patient treated with percutaneous coronary intervention and/or thrombolytic
If a STEMI, is the patient eligible for Percutaneous Coronary Intervention (PCI) and/or thrombolytic	If a STEMI, is the patient eligible for Percutaneous Coronary Intervention (PCI) and/or thrombolytic	If a STEMI, is the patient eligible for Percutaneous Coronary Intervention (PCI) and/or thrombolytic
Time to operating room from STEMI patient presentation at receiving STEMI center		

DRAFT Revised 2-17-12

TCD STEMI Data Dictionary

* Seq numbers derived from NCDR ACTION Registry version 2.2

**This is an informational document developed by the TCD STEMI QA Work Group and is not part of the filed rules.

Element	Definition
Demographics	
Last Name	Seq 2000
First Name	Seq 2010
Middle Name	Seq 2020
Birthdate	Seq 2050
SSN	Last 4 digits of SSN
SSN Not Available	Seq 2031
Race	Seq 2070, 2071, 2072, 2073, 2074
Hispanic or Latino Ethnicity	Seq 2076
Gender	Seq 2060
Admission	
Patient Zip Code	Seq 3000
Zip Code Not Available	Seq 3001
Means of Transport to First Facility	Seq 3100
First Medical Contact Date and Time	Seq 3105, 3106
First Medical Contact Time Estimated	Seq 3107
Transferred from Outside Facility	Seq 3110
Means of Transfer	Seq 3115
Arrival at Outside Facility Date and Time	Seq 3120, 3121
Arrival Time Estimated	Seq 3122
Transfer from Outside Facility Date and Time	Seq 3125, 3126
Transfer Time Estimated	Seq 3127
Arrival Date/Time Level 1 or 2	Seq 3200, 3201
Location of First Evaluation	Seq 3220
Principal Diagnosis Code	Seq 12090
Principal Procedure Code	Seq 12100
STEMI Center Level	Missouri State Designation for each facility that participated in the patient's care. Level I Level II Level III Level IV Non-participating Center
Cardiac Status on First Medical Contact	
Symptom Onset Date/Time	Seq 4000, 4001
Symptom Time Estimated	Seq 4002
Symptom Time Not Available	Seq 4003
First ECG Obtained	Seq 4010
First ECG Date/Time	Seq 4020, 4021
STEMI or STEMI Equivalent	Seq 4030
ECG Findings (ST elevation, LBBB, Posterior)	Seq 4040

STEMI Equivalent First Noticed (first or subsequent ECG)	Seq 4041
Cardiac Status on First Medical Contact con't	
Subsequent ECG Date/Time	Seq 4042, 4043
Heart Failure	Seq 4100
Cardiogenic Shock	Seq 4110
Cocaine Use	Seq 4115
Heart Rate	Seq 4120
Systolic BP	Seq 4130
Cardiac Arrest	Seq 4135
Cardiac Arrest pre-hosp	Seq 4140
Cardiac Arrest Outside Facility	Seq 4145
History and Risk Factors	
Height	Seq 5000
Weight	Seq 5010
Current/Recent Smoker	Seq 5020
HTN	Seq 5030
Dyslipidemia	Seq 5040
Chronic Lung Disease	Seq 5060
Prior MI	Seq 5080
Prior Heart Failure	Seq 5090
Prior PCI	Seq 5100
Prior CABG	Seq 5110
Cerebral Vascular Disease	Seq 5130
Prior Stroke	Seq 5131
Peripheral Arterial Disease	Seq 5140
Medications	
Aspirin (home, arrival and discharge) & contraindications	Seq 6000-6021
Clopidogrel (home, arrival and discharge) & contraindications	Seq 6050-6072
Prasugrel (home, arrival and discharge) & contraindications	Seq 6150-6172
*Ticagrelor	Future element
Beta blocker (home, arrival and discharge) & contraindications	Seq 6250-6270
ACE-I (home, arrival and discharge) & contraindications	Seq 6300-6320
ARB (home, arrival and discharge) & contraindications	Seq 6350-6370
Statin (home, arrival and discharge) & contraindications	Seq 6450-6470
GP IIb/IIIa Inhibitor	Seq 6800-6807

Medications con't	
Anticoagulant	Seq 6850-6857 Seq 6860-6865 Seq 6870-6873 Seq 6875-6877 Seq 6880-6882 Seq 6885-6887 Seq 6890-6892
Reperfusion Strategies	
Patient is reperfusion candidate	Seq 8000
If no, primary reason	Seq 8011
If yes, thrombolytic	Seq 8020
Thrombolytic Date/Time	Seq 8023, 8024
Thrombolytic Non-system delay	Seq 8025
Reperfusion candidate but no thrombolytic reason	Seq 8035
If yes, PCI	Seq 8015
Reperfusion candidate but no PCI reason	Seq 8030
PCI	Seq 7100
CV Lab Arrival Date/Time	Seq 7101, 7102
First device Activation Date/Time	Seq 7103, 7104
PCI Indication	Seq 7109
PCI Non-system delay	Seq 7110
CABG	Seq 7200
CABG Date/Time	Seq 7201, 7202
In-hospital Clinical Events	
Cardiogenic Shock	Seq 9010, 9011
Heart Failure	Seq 9020, 9021
CVA/Stroke	Seq 9030, 9031, 9032
Cardiac Arrest	Seq 9035, 9037
Laboratory Values	
Troponin (initial, peak)	Seq 10010-10014 Seq 10030-10034
CKMB (initial, peak)	Seq 10020-10023, 10025
Creatinine (initial, peak)	Seq 10100-10103 Seq 10110-10113
Hemoglobin (initial, lowest)	Seq 10150-10153 Seq 10200-10203
Initial HgA1c	Seq 10250-10253
Lipids	Seq 10350-10356, 10360
Discharge	
Discharge Date	Seq 11000
Comfort Measures	Seq 11010
Clinical Trial	Seq 11020
Discharge Status	Seq 11100

If deceased, cause	Seq 11150
P	Seq 11151
Discharge con't	
Smoking Counseling	Seq 11101
Dietary Modification	Seq 11102
Exercise Counseling	Seq 11103
Cardiac Rehab	Seq 11104
Performance Improvement	
Time from first medical contact or pre-hospital ECG STEMI identification to hospital door to device or balloon time	
Thrombolytic administration time from first medical contact or pre-hospital ECG STEMI identification to hospital door or needle time	
Number of STEMI patients presenting within the treatment window for percutaneous coronary interventions and/or thrombolytic administration	
Number of eligible STEMI patients treated with percutaneous coronary intervention and/or thrombolytic	
Time to operating room from STEMI patient presentation at receiving STEMI center	

02.27.2012

TCD STEMI Center Quality Metrics*

The proposed STEMI metrics for the State of Missouri TCD program are based on measuring the success of the state system in achieving the mission of the right care in the right place at the right time.

** The information reported to the TCD registry will be used to generate these measures. These measures are not part of the filed regulations.*

The goals of the TCD are to:

- Decrease the incidence and the severity of STEMI in the state of Missouri
- Improve access to care for the STEMI patient
- Improve outcomes for the STEMI patient
- Improve the system of evaluation and improvement process across the STEMI continuum of care.

References:

Guidelines for Management of ST elevation Myocardial Infarction. 2004.
Journal of American College of Cardiology. 44:671-719.
STEMI/PCI Focused Update. 2009. Journal of American College of
Cardiology. 54:2205-2241

NCDR ACTION Registry GWTG version 2.2

Descriptive Measures:

Patient Data Elements

Patient name; Date of Birth; Gender; Race; Social Security (last four digits); Date(s) of Service; EMS Service; Destination/Transferred To (primary and secondary)

1. Number of STEMI

Metrics:

Definition: Number of patients treated with ST elevation in two contiguous leads or new or presumed to be new onset LBBB or true posterior STEMI. Stratify by those that present within 12 hours of symptom onset and those that present outside of 12 hours after symptom onset.

Elements: ICD-9 Discharge diagnosis
Date and Time of symptom onset
Date and Time of Arrival

Other possible sources: Troponin list
STEMI activation

2. Frequency of PCI in eligible STEMI

Metrics:

Numerator: Number of STEMI patients that receive a PCI

- Emergent PCI within 24 hours of diagnosed ST elevation or new LBBB

Denominator: All STEMI patients

Elements:

- Reperfusion strategy
 - PCI
 - Lytic
 - CABG
- ECG date and time

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3. Frequency of Fibrinolytic Therapy in STEMI patientsMetrics:

Numerator: Number of STEMI patients that receive fibrinolytic therapy

- Fibrinolytic Therapy within 12 hours of symptom onset

Denominator: All STEMI patients Elements: Fibrinolytic therapy
Symptom onset date and time**4. Frequency of CABG for reperfusion therapy in STEMI patients**Metrics:

Numerator: Number of STEMI patients that receive CABG as reperfusion therapy

Elements: CABG

5. Frequency of no Reperfusion TherapyMetrics:

Numerator: Number of STEMI patients that do not receive PCI, fibrinolytic therapy or CABG

Denominator: All STEMI patients

Elements: ICD 9 Discharge diagnosis
No reperfusion strategyProcess Measures:**1. Symptom onset to first medical contact**Metrics:

Time of symptom onset to time of EMS first medical contact in patients arriving via EMS.

- Median Time
- Mean Time

Elements: Symptom onset date and time
Means of transport to first facility is ambulance, air, or mobile ICU
First medical contact date and time**2. Symptom onset to door of first facility**Metrics:

Time of symptom onset to arrival date and time at first facility in patients arriving via private vehicle

- Median Time
- Mean Time

Elements: Symptom onset date and time
Means of transport to first facility is self/family
Arrival date and time
Arrival at outside facility date and time**3. First medical contact to door of first facility**Metrics:

Time of first medical contact to arrival at first facility in patients arriving via EMS

- Median Time
- Mean Time
-

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Elements: First medical contact date and time
 Means of transport to first facility is ambulance, air or mobile ICU
 Arrival date and time

4. First medical contact or door to first ECG

Metrics:

Time of first medical contact to pre-hospital ECG or Time of arrival to first ECG

- Median Time
- Mean Time

Elements: Location of first evaluation
 Means of transport to first facility is ambulance, air or mobile ICU
 First medical contact date and time
 Arrival Date and Time
 Pre-hospital ECG
 ECG date and time

5. Door in to door out

Metrics:

Time of arrival at first facility to time of departure for higher level STEMI center in patients that transfer to Level 1 or 2 STEMI centers for PCI

- Median Time
- Mean Time

Elements: Patient transferred for PCI
 First door in
 First door out

6. Transport time to Level 1 or Level 2 STEMI centers from referral centers

Metrics:

Time of departure from first facility to time of arrival at higher level STEMI center in patients that transfer to Level 1 or 2 STEMI centers for PCI

- Median Time
- Mean Time

Elements: Patient transferred for PCI
 Door out
 Arrival date and time

7. Door to first device activation

Metrics:

Time of arrival to time of first device activation in STEMI patients presenting to Level 1 or Level 2 STEMI center

- Median Time
- Mean Time

Elements: Arrival date and time
 First device date and time

8. EMS to first device activation

Metrics:

Time of first medical contact to time of first device activation in patients that arrive to Level 1 or Level 2 STEMI Center via EMS.

- Median Time
- Mean Time

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Elements: First medical contact date and time
First device date and time

9. Positive ECG to first device activation

Metrics:

Time of positive ECG to first device activation on inpatients or patients with positive ECG on subsequent ECGs

Median Time
Mean Time

Elements: ECG Date and Time
Subsequent ECG
Subsequent ECG Date and Time

10. Door to door to device activation

Metrics:

Time of arrival at first facility to time of first device activation in patients that transfer from another facility for a PCI

- Median Time
- Mean Time

Elements: Patient transferred for PCI
Arrival date and time
First device date and time

11. Door to needle time

Metrics:

Time of arrival to time of initiation of thrombolytic.

- Median Time
- Mean Time

Performance Measures:

1. Frequency of door to device \leq 90 minutes

Metrics:

Numerator: Number of STEMI patients with PCI within 90 minutes

Denominator: Number of STEMI patients that arrive or are an inpatient at a Level 1 or 2 STEMI center

Elements: Process measure door to first device activation
Process measure positive ECG to first device activation

2. Frequency of door to device \leq 60 minutes

Metrics:

Numerator: Number of STEMI patients with PCI within 60 minutes

Denominator: Number of STEMI patients that arrive or are an inpatient at a Level 1 or 2 STEMI

Elements: Process measure door to first device activation
Process measure positive ECG to first device activation

3. Frequency of EMS to device \leq 90 minutes

Metrics:

Numerator: Number of STEMI patients with PCI within 90 minutes

Denominator: Number of STEMI patients that arrive at a Level 1 or 2 STEMI center via EMS

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Elements: Process measure EMS to first device activation

4. Frequency of EMS to device \leq 60 minutesMetrics:

Numerator: Number of STEMI patients with PCI within 60 minutes

Denominator: Number of STEMI patients that arrive at a Level 1 or 2 STEMI center via EMS

Elements: Process measure EMS to first device activation

5. Frequency of door to door to device \leq 120 minutesMetrics:

Numerator: Number of STEMI patients with PCI within 120 minutes when transferred to a Level 1 or 2 STEMI center for PCI.

Denominator: Number of STEMI patients with PCI when transferred to a Level 1 or 2 STEMI center for PCI

Elements: Process measure door to door to device activation.

6. Frequency of door to door to device \leq 90 minutesMetrics:

Numerator: Number of STEMI patients with PCI within 90 minutes when transferred to a Level 1 or 2 STEMI center for PCI.

Denominator: Number of STEMI patients with PCI when transferred to a Level 1 or 2 STEMI center for PCI

Elements: Process measure door to door to device activation.

Utilization Measures (Report at State wide Level only)**1. Frequency of presentation with Cardiogenic Shock**Metrics:

Numerator: Number of STEMI patients with cardiogenic shock on presentation

- Level 1 STEMI Center
- Level 2 STEMI Center
- Level 3 STEMI Center
- Level 4 STEMI Center
- Non-participating center

Denominator: Number of STEMI patients.

- Level 1 STEMI Center
- Level 2 STEMI Center
- Level 3 STEMI Center
- Level 4 STEMI Center
- Non-participating center

Elements: Admission cardiogenic shock
Patient arrival location (STEMI Center Level)

02.27.2012

2. Frequency of presentation in Cardiac ArrestMetrics:

Numerator: Number of STEMI patients with cardiac arrest prior to or upon presentation

- Level 1 STEMI Center
- Level 2 STEMI Center
- Level 3 STEMI Center
- Level 4 STEMI Center
- Non-participating center

Denominator: Number of STEMI patients.

- Level 1 STEMI Center
- Level 2 STEMI Center
- Level 3 STEMI Center
- Level 4 STEMI Center
- Non-participating center

Elements: Cardiac arrest prior to or upon presentation
Patient arrival location (STEMI Center Level)

3. Frequency of presentation to facility without primary PCI capabilitiesMetrics:

Numerator: Number of "eligible" patients transferred to a Level 1 or 2 STEMI center for PPCI

- Arrival at first facility by private vehicle
- Arrival at first facility by EMS

Denominator: All STEMI patients

Elements: Patient arrival location (STEMI Center Level)
Means of transport to first facility

4. Percent of STEMI patients with initial presentation at each STEMI center level.Metrics:

Numerator: Number of patients with initial presentation at:

- Level 1 Center
- Level 2 Center
- Level 3 Center
- Level 4 Center
- Non-participating Center

Denominator: All STEMI patients

Outcome Measures:**1. Mortality – Frequency that STEMI patients expire prior to dismissal from the hospital.**Metrics:

Numerator: Number of STEMI patients that expire prior to dismissal from the hospital

Denominator: All STEMI patients

Elements: Discharge Status

2. Inpatient Risk Adjusted Mortality – Frequency that risk adjusted STEMI patients expire prior to dismissal from the hospital

02.27.2012

Metrics:

* Investigating possibility of using the ACC risk adjusted mortality model for eligible patients

3. All Cause 30 day Mortality – Frequency that STEMI patient expire within 30 days of the STEMI eventMetrics:

- Investigating possibility of using vital records to obtain 30 day mortality for eligible patients
- Element: Last 4 digits of SSN

4. Frequency of development of Cardiogenic ShockMetrics:

Numerator: Number of STEMI patients that develop cardiogenic shock in your facility..

Denominator: All STEMI patients excluding patients that presented with cardiogenic shock

Elements: Cardiogenic Shock on presentation
Cardiogenic Shock developed after STEMI

5. Frequency of development of StrokeMetrics:

Numerator: Number of “eligible” STEMI patients that have a stroke or CVA in your facility

Denominator: All STEMI patients

Elements: Stroke developed after STEMI

6. Heart FailureMetrics:

Numerator: Number of STEMI patients that develop heart failure in your facility

Denominator: All STEMI patients

Elements: Heart failure on presentation
Heart failure developed after STEMI

7. Length of StayMetrics:

Hospital length of stay in days from arrival to discharge. Stratify by patient arrival location

- Median Time
- Mean Time

Elements: Arrival date and time
Discharge date and time
Patient arrival location (STEMI center level)

8. Percentage of STEMI patients presenting within treatment window for thrombolytic and/or PCI

Numerator: Number of STEMI patients presenting within the treatment window for PCI and/or thrombolytic administration

Denominator: Total number of STEMI patients presenting

9. Percentage of eligible STEMI patients treated with PCI and/or thrombolytic

Numerator: Number of STEMI patients eligible for PCI and/or thrombolytic who were treated with PCI and/or thrombolytic

Denominator: Number of all STEMI patients eligible for PCI and/or thrombolytic

Section 5:

Professional Education

Time Critical Diagnosis (TCD) System Pre-Hospital Professional Education Work Group Recommendations

Recommendations from the TCD Professional Education Pre-Hospital Workgroup 2011

Thank you to the members of the TCD Pre-Hospital Professional Education Workgroup who volunteered their time to identify the following recommendations and information. This workgroup's intent was to provide useful educational information for all pre-hospital professionals.

The mission of the Pre-Hospital Professional Education Workgroup is to identify professional education information and resources for pre-hospital emergency medical care providers so they can provide exceptional care for TCD patients.

This document is comprised of two sections. The first section presents recommended educational information. The remaining section provides a catalog of resources designed to assist providers in obtaining TCD related education.

Section I - Recommended Educational Guidelines

General

The provider should be able to:

- Demonstrate a working knowledge of TCD regulations, including transport implications in the participant's specific region (BLS/ALS)
- Describe appropriate treatment and transport decisions according to state destination protocols or community plan (BLS/ALS)

STEMI

The provider should be able to:

- Describe what a ST-Elevation Myocardial Infarction (STEMI) is and understand why it is a TCD (BLS/ALS)
- The importance of the timeline (eg. time of symptom onset, when symptoms became persistent, when 9-1-1 was called, etc) should be emphasized
- Accurately acquire a 12 lead EKG (BLS/ALS)
- Understand and/or acquire a 15 lead EKG if indicated and available (ALS)
- Transmit EKG information to the receiving hospital utilizing the best available means (BLS/ALS)
 - Includes verbal transmission of information if electronic means is unavailable
- Recognize the presence of a STEMI on a 12 lead EKG (ALS)
 - Recognize the presence of ST elevation in contiguous leads
 - Recognize the major imitators of ST segment elevation
 - Recognize the presence of a bundle branch block and its impact on STEMI identification
 - Describe the importance of serial EKGs
- Describe appropriate treatment modalities for the STEMI patient (BLS/ALS)
 - Administration of oxygen, nitroglycerin, morphine and aspirin according to local protocol
 - Transport to appropriate STEMI center for PCI or fibrinolytic therapy according to state or community plan
- Describe some of the complications associated with the various AMI presentations (ALS)
 - Recognize the importance of 15 lead EKG acquisition when indicated to rule out right ventricular infarction

Stroke

The provider should be able to:

- Describe what a stroke is and understand why it is a TCD (BLS/ALS)
- Recognize the signs and symptoms of a stroke (BLS/ALS)

- Have familiarity with performance of accepted stroke scoring systems
- Determine the *time last known well* and understand the importance of accurately communicating and documenting interview information (BLS/ALS)
 - The importance of the timeline (eg. time of symptom onset, when symptoms became persistent, when 9-1-1 was called, etc) should be emphasized
 - Obtain interview information that includes contact information for a person with knowledge of the patient's condition
 - This person should be brought to the hospital *with the patient* whenever possible
 - The importance of clearly communicating the patient interview information to the hospital staff during patient hand-off must be emphasized
- Describe appropriate treatment modalities for the stroke patient (BLS/ALS)
 - Oxygen administration according to medical control guidelines
 - Assessment of blood glucose level and treatment according to medical control guidelines
 - Management of hypertension according to medical control guidelines
 - Understand the importance of establishing adequate IV access in patients that may require fibrinolytic therapy
 - Must not delay transport

Trauma

The provider should be able to:

- Describe what critical trauma is and understand why it is a TCD (BLS/ALS)
- The importance of the timeline (eg. time of onset, when symptoms became persistent, when 9-1-1 was called, etc) should be emphasized
- Demonstrate a working knowledge of field triage procedures employed in the participant's specific region for mass casualty incidents (BLS/ALS)
 - Includes familiarity with trauma tagging systems such as METTAG or SMART Triage
 - Knowledge of electronic patient tracking systems if used locally
- Describe the criteria utilized to determine transport destination based on injury severity and transport protocols in CSR 30-40.780 or community based or regional plan in 19 CSR 30-40.770 (BLS/ALS)
- Describe appropriate treatment modalities for the trauma patient (BLS/ALS)
 - Treatment guidelines according to nationally accepted standards
 - Includes transport destination decisions as described by state or community plan
 - Familiarity with injury specific guidelines and availability of specialty resource centers

Service Medical Directors and Administrators

The medical director and administrator should be able to:

- Demonstrate an understanding of procedural and process needs
 - Emphasis on appropriate protocol development to ensure their service is in compliance with best practices and treatment guidelines for TCD patients
- Demonstrate familiarity with transport protocol in 19 CSR 30-40.780 and community based or regional plan in 19 CSR 30-40.770 protocols and local or regional community plans

Section II - Education Resources (*not an inclusive list)

Topic	Type of Program	Sponsoring Organization / Company	Target Audience	CE Credit	Cost	Website	Comments
Acute ST Elevation, MI Care, ECG Interpretation	On-line, self-directed	Apex Innovations	Prehospital and Hospital	Varies	Yes	www.apexinnovations.com	Very detailed and interactive cardiac teaching/learning tools.
ECG Operation & Interpretation; Stroke Assess & Treatment	On-line, self-directed	RapidCE (Centrelearn)	Prehospital	Most are 1 CEU	Yes	www.centrelearn.com	
Cardiovascular Care	On-line, self-directed	Up ToDate Inc.	Prehospital and Hospital	No	No	www.uptodate.com	Participant reads articles that have been written about previous questions asked, with supporting documentation quoted.
Various Cardiovascular and Trauma Topics	On-line, self-directed	Wild Iris Medical Education	Prehospital	Varies	Yes	www.wildirismedical.com	
Various Cardiovascular and Trauma Topics	On-line, self-directed	Medic-CE	Prehospital	Varies	Yes	www.medic-ce.com	
12 Lead EKG; Assess & Treatment of Trauma	On-line, self-directed	Kaplan Continuing Education	Prehospital	Varies	Yes	www.kaplansolutions.com	
Various Cardiovascular and Trauma Topics	On-line, self-directed	EmCert.com	Prehospital	Varies	Yes	www.emcert.com	
Topic	Type of Program	Sponsoring Organization / Company	Target Audience	CE Credit	Cost	Website	Comments
Rapid STEMI ID	On-line, self-directed	American Heart Association	Prehospital and Hospital	4.5 CEUs	Yes	www.heart.org	

STEMI Provider Manual	80 page booklet & online exam	American Heart Association	Prehospital and Hospital	1.5 CEUs	Yes	www.heart.org	
Various Cardiovascular Topics	Reading Material	American Heart Association	Prehospital and Hospital	No	No	www.heart.org	Research articles and other material available
NIH Stroke Scale	Reading Material	National Institute of Health	Prehospital and Hospital	No	No	www.ninds.nih.gov	
NIH Stroke Scale	DVD	NINDS and NIH	Prehospital and Hospital	Varies	Yes	www.ninds.nih.gov	National Institute of Neurological Disorders and Stroke and the National Institute of Health Stroke Scale training DVD as well as free download of the stroke scale in two formats.
Advanced Stroke Life Support Program	Instructor Lead	Lincoln County Ambulance District and University of Miami	Prehospital and Hospital	Varies	Yes	www.lcad.net www.asls.net	
Stroke	Reading Material	National Stroke Association	Prehospital and Hospital	No	No	www.stroke.org	Research articles and other material available
Various Stroke Topics	On-line, self-directed	National Stroke Association	Prehospital and Hospital	Varies	Varies	www.stroke.org	Stroke Nurse Education Modules (over 17 different topics)
Various Stroke Topics	Reading Material	American Stroke Association	Prehospital and Hospital	No	No	www.strokeassociation.org	Research articles and other material available
Topic	Type of Program	Sponsoring Organization / Company	Target Audience	CE Credit	Cost	Website	Comments
Telecommunication and Stroke	On-line, self-directed	American Stroke Association	Prehospital and Hospital	Varies	Varies	http://learn.heart.org	Telestroke models and AHA Telestroke recommendations

Acute Stroke Science: The Foundation for Quality Stroke Care in the Critical Access Hospital Setting	On-line, self-directed	American Stroke Association	Prehospital and Hospital	2 CEUs	Yes	http://learn.heart.org	Overview of acute stroke science treatment recommendations and supporting science with emphasis on the acute stroke capable critical access hospital
Hemispheres Stroke Competency Series	On-line, self-directed	Empower Learning Solutions	Prehospital and Hospital	Varies	Yes	www.empowerbpo.com/hemispheres.html	Hemispheres™ Stroke Competency Series is a multi-level, web-based educational series designed for healthcare professionals to stay up to date on the standards of care for stroke patients. This comprehensive program allows everyone from physicians to students to expand their knowledge and sharpen their skills. Essential for orientation, annual competencies and continuing education.
Stroke Education Presentations and Discussions	On-line, self-directed	Washington University School of Medicine	Advanced Prehospital and Hospital	No	No	www.strokecenter.org	
Stroke Care for EMTs and Paramedics	On-line, self-directed	Washington University School of Medicine	Prehospital	1 CEU	No	www.strokecenter.org	Designed to be informative for both Basic Life Support (BLS) and Advanced Life Support (ALS) pre-hospital providers. Includes nine (9) sections of content followed by a multiple choice test.
Topic	Type of Program	Sponsoring Organization / Company	Target Audience	CE Credit	Cost	Website	Comments
PreHospital Trauma Life Support (PHTLS) Program	Instructor Lead	National Association of EMTs	Prehospital	Varies	Yes	www.phtls.org	

International Trauma Life Support (ITLS) Program	Instructor Lead	International Trauma Life Support	Prehospital	Varies	Yes	www.itrauma.org	
Assessment and Treatment of Trauma (ATT) Program	Instructor Lead	American Academy of Orthopaedic Surgeons	Prehospital	Varies	Yes	www.attrauma.com	
Time Critical Diagnosis System	On-line, self-directed	Missouri Department of Health and Senior Services	Prehospital and Hospital	No	No	www.dhss.mo.gov	

Missouri State Resources:

Mo Department of Health and Senior Services (DHSS) www.health.mo.gov

DHSS Time Critical Diagnosis System

www.health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php

DHSS Bureau of Emergency Medical Services

www.health.mo.gov/safety/ems/index.php

DHSS Division of Community and Public Health links

<http://health.mo.gov/living/index.php>

<http://health.mo.gov/living/healthcondiseases/chronic/index.php>

<http://health.mo.gov/living/lpha/index.php>

<http://health.mo.gov/living/families/index.php>

Time Critical Diagnosis (TCD) System Trauma Professional Education Work Group Recommendations

Recommendations from the TCD Professional Education Trauma Workgroup (October 2010 to July 2011)

Thank you to the members of the TCD Trauma Professional Education Workgroup who volunteered their time to identify the following recommendations and information. This workgroup's intent was to provide useful information for all designated TCD Trauma Centers.

The TCD Trauma Professional Education Workgroup has been established to review courses relevant to stroke credentialing, create a summary of available course sites and provide resource.

Goals:

1. Create a list of core competencies that reflect appropriate patient care modalities for trauma patients.
2. Review national and state courses for relevant content related to trauma patient care competencies.
3. Create a working document or catalog of resources to assist facilities in locating accepted competency courses.
4. Create overall messaging for TCD health professionals for TCD and Trauma Providers.

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Section I

Trauma Care Providers

The TCD Trauma Task Force recommends that the following Trauma Care Providers involved in direct trauma care within the emergency department or hospital services, in addition to those staff identified in the trauma center regulations (19 CSR 30-40.430, 440, and 450), receive Trauma professional education:

Trauma Care Providers include the following:

- Trauma Medical Director
- Trauma Program Manager/Coordinator
- Emergency Department Nurses
- ICU Nurses
- Emergency Department EMT-B
- Emergency Department EMT-I
- Emergency Department Paramedics
- Trauma Surgeons
- Trauma Medical Director
- Trauma Program Manager/Coordinator
- Emergency Department Physicians
- Neurosurgical Liaisons
- Orthopedic Liaisons
- Anesthesia Liaisons
- Residents
- All other personnel involved in trauma care

Section II

TCD Trauma Center Professional Education Hour Requirements

Center Designation Levels	I	II	III	IV
Emergency Department (ED) Nurses Credentialing requirement first year	8 per yr	8 per yr	8 per yr	8 per yr
ED Physician	8 per yr	8 per yr	8 per yr	8 per yr if on trauma call roster
Intensive Care Unit (ICU) Nurses Credentialing requirement first year	8 per yr	8 per yr	NA	NA

In programs caring for pediatric patients less than 15 years of age, 4 hours must be in pediatrics

Credentialing requirement (ED) Nurses: TNCC or ATCN , PALS, APLS or ENPC first year maintained there after

ED Physicians caring for trauma patients if board certified must have ATLS at least once. Non board certified ED Physicians must maintain ATLS

Credentialing requirement(ICU) Nurses: ACLS or registered on initial review, Trauma specific education recommended

Pediatric ICU must maintain PALS, APLS or ENPC, Trauma specific education recommended

Center Designation Levels	I	II	III	IV
Trauma Call Roster	8 per yr	8 per yr	8 per yr	8 per yr
Anesthesia Liaison	8 per yr	8 per yr	8 per yr	
Orthopedic Liaison	8 per yr	8 per yr	8 per yr	
Neurosurgical Liaison	8 per yr	8 per yr	8 per yr	

Trauma Medical Director	16 per yr	16 per yr	16 per yr	16 per yr
Trauma Program Manager	16 per yr	16 per yr	16 per yr	8 per yr

In programs caring for pediatric patients less than 15 years of age, 4 hours must be in pediatrics

Hospital specific programs must be filed with the DHSS office

All general surgeons on the call roster must maintain ATLS or be registered on initial review

The hour requirements are from draft regulations on TCD website 1/19/2011 (the future resource will be 19 CSR 30-40-430, 440, and 450). Per these regulations, trauma education materials and programs must be approved by the Trauma Medical Director and or Trauma Program Manager. Hospitals are required to provide documentation related to completion of professional education requirements listed above.

Section III

Trauma Education for Other Hospital Staff

The TCD Trauma Task Force recommends that Trauma Centers identify other professionals, in addition to those staff identified in the trauma center regulations (19 CSR 30-40.430, 440, and 450), who would benefit by trauma professional education including, but not limited to:

- Primary Care Providers
- Rapid Response Team**
- Radiologists
- Advanced Practice Nurses
- Physician Assistants
- Rehab
- Laboratory / Blood bank
- Case management
- Social workers
- Pastoral Care
- RN (all hospital staff)
- Pastoral Care

**This TCD workgroup discussed that some hospitals have a designated “Rapid Response Team” in addition to the Trauma Team.

TCD Trauma Centers may identify ancillary/unlicensed staff that would benefit by Trauma professional education:

Suggestions include: technicians, certified nursing assistants, admitting staff, dietary, housekeeping, transporters, security and others. Information could include, but is not limited to:

- Early activation in accordance with hospital protocol
- Trauma Team development
- Rural Trauma Team development
- Trauma levels of team activation

Section IV

Core Competencies TCD Professional Education: Trauma

The following are suggestions from the TCD Trauma Professional Education Workgroup for core competencies. Your selections should be based on the individual needs of your facility, TCD QA measures, and the goal of improving patient outcomes.

******The education should be tailored to the individual needs of your facility******

Knowledge of the processes specific to your facility, and knowledge of the state or community plan.

Awareness of “pre-hospital” and “intra-hospital” and “post-hospital” care in relation to your facility in the stroke process of the Time Critical Diagnosis 360°/365° Emergency Medical Care System Continuum

Core Trauma Team

Emergency Department Nurses: TNCC or ATCN / ACLS / PALS , APLS or ENPC / Credentialing within the first year

Intensive Care unit Nurses, Adult: ACLS , Credentialing within the first year , trauma specific education recommended

Pediatric Intensive Care Nurses: PALS, APLS or ENPC, Credentialing within the first year, trauma specific education recommended

ED Physicians: ATLS, Credentialed to provide care by the facility, boarded emergency physicians must take ATLS once, non boarded emergency physicians must maintain ATLS

General Surgeons: ATLS maintained, Credentialing to provide care by the facility

EMS providers: ITLS or PHTLS, ACLS, PALS or APLS

Rural Trauma Team Development Course is suggested for facilities with limited resources for provision of trauma care

Section V

TCD Trauma Center Professional Education Resource Catalog

The following are suggestions from the TCD Trauma Professional Education Workgroup

Advanced Cardiac Life Support

American Heart Association

Instructor led Course

Target Audience: Physicians/ Nurse Practitioners/ PA's / Nurses / EMT-P

Cost: yes

CEU/CME Credits: yes

Course Description: ACLS is an advanced course providing rigorous knowledge base and hands on skills regarding the care of sudden cardiac events and other life threatening medical emergencies.

Web Address: <http://www.heart.org/HEARTORG/>

Advanced Trauma Care for Nurses

Society of Trauma Nurses

Instructor led Course

Target Audience: Nurses providing care for trauma patients

Cost: yes

CEU: yes

Course Description: An advanced course designed for the nurse interested in increasing knowledge related to the care of trauma patients. The ATCN course has hands on scenario based approach.

Web Address: <http://www.traumanurses.org/atcn-courses.html>

Advanced Trauma Life Support

The American College of Surgeons

Instructor led course

Target Audience: Trauma Care Providers. Physicians/ PA's / Nurse Practitioners/Nurses/ EMT-P

Cost: yes

CEU / CME Credits: Physician CME may vary dependant on class type (2 day or refresher)

Course Description: ATLS is a provider based course that is designed to lead physicians and staff through all aspects of trauma care. Non physician participants are designated as course auditors.

Web Address: <http://facs.org>

Advanced Pediatric Life Support

American Academy of Pediatrics

Instructor led Course / Online

Target Audience: Pediatric Care Providers. Physicians/ PA's / Nurse Practitioners/Nurses/ EMT-P

Cost: yes

CEU/CME Credits: yes

Course Description: APLS is designed to provide a consistent approach to the assessment of the sick child based on examination and appearance.

Web Address: www.aap.org on line version <http://www.aplsonline.com/>.

Basic Life Support**American Heart Association****Instructor led Course****Target Audience: Health Care Providers/ Lay public / Individuals****Cost: yes****CEU/CME Credits: No****Course Description:** BLS provides basic life support skills with hands on practice and performance requirements.**Web Address:** <http://www.heart.org/HEARTORG/>**Emergency Nursing Pediatric Course****Emergency Nurses Association****Instructor led Course****Target Audience: Nurses providing pediatric emergency care****Cost: yes****CEU/CME Credits: yes 15.33****Course Description:** ENPC is an outstanding course that provides pediatric emergency nursing knowledge and psychomotor skill experience.**Web Address:** www.ena.org**International Trauma Life Support****International Trauma Life Support****Instructor led Course****Target Audience: Paramedic/ EMT-B/ First Responders****Cost: yes****CEU Credits: yes****Course Description:** ITLS is designed to provide knowledge and hands on skills for the care of trauma patients in the field.**Web Address:** <http://www.itrauma.org>**Pediatric Advanced Life Support****American Heart Association****Instructor led Course****Target audience: Pediatric Care Providers. Physicians/ PA's / Nurse Practitioners/Nurses/ EMT-P****Cost: yes****CEU/CME Credits: yes****Course Description:** Pediatric Advanced Life Support is designed to provide a consistent standardized approach to improve assessment, recognition and treatment of seriously ill pediatric patients.**Web Address:** <http://www.heart.org/HEARTORG/>**Pre-Hospital Trauma Life Support****National Association of Emergency Medical Technicians****Instructor led Course****Target audience: Paramedic/ EMT-B/ First Responders****Cost: Yes****CEU'/ CME Credits: yes****Course Description:** Pre-Hospital Trauma Life Support is designed to provide trauma patient management through critical thinking in the field. This course was developed from the ATLS program.**Web Address:** www.naemt.org

Trauma Nurse Specialist

Department of Transportation

Instructor led Course

Target Audience: Emergency Department Nurses

Cost: yes

CEU's: yes

Course description:

Web Address: www.illinoistraumanurses.org

Trauma Nursing Core Course

Emergency Nurses Association

Instructor led course

Target Audience: Nurses providing trauma care

Cost: yes

CEU Credits: Initial 2 day course 14.42 CEU, Refresher class 7.75 CEU

Course Description: TNCC is designed to provide participants with knowledge and skills to provide care to trauma patients in a standardized consistent approach.

Web Address: www.ena.org

Section VI

Additional Trauma and TCD Web Resources

National Resources:

Titles	Organization Name	Website
ATS	American Trauma Society	info@amtrauma.org
STN	Society of Trauma Nurses	www.traumanurses.org
ACS	American College of Surgeons	http://facs.org
ENA	Emergency Nurses Association	www.ena.org
AHA	American Heart Association	www.heart.org
NSC	National Safety Council	www.nsc.org
ITLS	International Trauma Life Support	www.itrauma.org/about/
PHTLS	Pre-hospital Trauma Life Support	www.naemt.org
TNS	Illinois Department of public Health/Highway Safety	www.illinoistraumanurse.org

Missouri State Resources:

Mo Department of Health and Senior Services (DHSS) www.health.mo.gov

DHSS Time Critical Diagnosis System

www.health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php

DHSS Bureau of Emergency Medical Services

www.health.mo.gov/safety/ems/index.php

DHSS Division of Community and Public Health links

<http://health.mo.gov/living/families/index.php>

<http://health.mo.gov/living/lpha/index.php>

Missouri Hospitals that provide Resources:

Facility	Contact /Email	Phone	BLS	ACLS	PALS	ENPC	ATLS	TNCC	TNCC-I	TNS	ENPC-I	CEN	Open
Barnes Jewish Hospital	STAR Harris slh3021@bjc.org	618-974-1201					*	*					*
Capital Regional Medical Center	Joann Cantriel icantriel@mail.crmc.org	573-632-5049	*	*	*								*
Childrens Mercy Hospital	David Seastrom dwseastrom@cmh.edu	816-983-6917	*		*			*					*
Citizens Memorial Hospital	Helen Mayfield hmayfe@citizensmemorial.com	417-328-7791	*	*	*	*		*					*
Cox Health	Jami Blackwell jamiann.blackwell@coxhealth.com	417-269-0919	*	*	*	*	*	*					*
Freeman Health System	Christine Hoag-Apel cnhaag-apel@freemanhealth.com	417-347-6298	*	*	*	*		*	*				
Lake Regional Hospital	Amy Knoernschild aknoernschild@lakeregional.com	573-348-8717	*	*		*		*	*				
Liberty Hospital	Carolyn Wells carolyn.wells@libertyhospital.org	1-816-792-7248	*	*		*		*					
North Kansas City Hospital	Lori Davis Lori.Davis@nkch.org	816-691-5245	*	*		*		*					*
Pike County Memorial	Dolly Giles dgiles@pcmhmo.org	573-754-5531 ext 16	*	*	*	*							*
St. Anthony's Medical Center	Kim Scott kim.scott@samcstl.com	314-525-4665	*	*	*			*	*				
St. Francis Medical Center	Lisa Mileur lmileur@sfmc.net	1-573-331-5324	*	*	*			*	*				
St. Johns Regional Joplin	Crystal Harvey crystal.harvey@mercy.net	417-625-2271	*	*	*			*					*
St. Johns Regional Springfield	Ted Shockley ted.shockley@mercy.net	417-820-3244	*	*	*	*	*	*					*
St. Johns Mercy Medical Center St. Louis	Denise Gray Denise.Gray@mercy.net	314-251-1947	*	*	*	*	*	*					*

Facility	Contact /Email	Phone	BLS	ACLS	PALS	ENPC	ATLS	TNCC	TNCC-I	TNS	ENPC-I	CEN	Open
St.Francis Medical Center	Lisa Mileur lmileur@sfmc.net	573-331-5324	*	*	*			*					*
St.Joseph's Health Center	Karen Kemper Karen_Kemper@ssmhc.com Peggy Nocchiero Peggy_Nocchiero@ssmhc.com	636-443-7502 636-947-5111				*		*					
St.Joseph Hospital West	Jason Cullom Jason_Cullom@ssmhc.com	636-625-7714				*		*					
St.Louis Children's Hospital	Diana Kraus dianaik@bic.org	314-454-2782			*	*							*
St.Louis University Hospital	Pam Golden pam.golden@tenethealth.com	314-577-8773					*	*		*			*
St.Lukes Hospital KC	Michael McGee mmcgee@saint-lukes.org	816-932-2459						*					*
Lake Regional Hospital	Amy Knoernschild aknoernschild@lakeregional.com	573-348-8717	*	*		*		*					*
St. Anthony's Medical Center	Kim Scott kim.scott@samcstl.com	314-525-4665	*	*	*			*					*
Freeman Health System	Christine Hoag-Apel cnhag-apel@freemanhealth.com	417-347-6298	*	*	*	*		*					*
Liberty Hospital	Carolyn Wells carolyn.wells@libertyhospital.org	816-792-7248	*	*		*		*					*
St. Louis Chapter ENA	Helen Sandkuhl helen.sandkuhl@tenethealth.com	314-577-8774				*		*	*		*	*	*
University of Missouri Healthcare	Carol Nierling NierlingCA@health.missouri.edu Linda Batson batsonid@health.missouri.edu	573-882-1535 573-882-1410					*	*					*
Kansas City Chapter ENA	Lori Davis Lori.Davis@nkch.org	816-691-5245							*		*	*	*
De Paul Health Center	Lucy Appleton lucy_appleton@ssmhc.com	314-344-7435				*		*					*

Section VII

Trauma Professional Education Definitions and Information

From proposed TCD regulations: **Definitions and Abbreviations Relating to Trauma Centers (19 CSR 30-40.410)**

CME: Continuing medical education and refers to the highest level of continuing education approved by the Missouri State Medical Association, the Missouri Association of Osteopathic Physicians and Surgeons, the American Osteopathic Association, or the Accreditation Council for Continuing Medical Education.

Continuing Education: Education approved by a national and/or state professional organization and/or the Trauma Medical Director.

Credentialed or credentialing: Is a hospital specific system of documenting and recognizing the qualifications of medical staff and nurses and authorizing the performance of certain procedures and establishing clinical privileges in the hospital setting.

From proposed TCD regulations for **Trauma Center Designation (19 CSR 30-40.430):**

(4) (D) A professional education outreach program shall be established in the region and outlying areas to provide training and other supports to improve care of trauma patients ((I-R, II-R, III-R)

(4) (E) A training program on caring for trauma patients shall be established for professionals in the trauma center (I-R, II-R, III-R, IV-R)

1. There shall be a hospital-approved procedure for training nurses and clinical staff to be credentialed in trauma care.
2. The trauma center shall have a mechanism to assure that all nurses providing care to trauma patients shall complete a minimum of required continuing education to become credentialed in trauma care as stated in these regulations; and
3. The content and format of any trauma continuing education courses developed and offered by a hospital shall be developed with the oversight of the trauma medical director. A copy of the course curriculum used shall be filed with the department.

(4) (F) The hospital shall be actively involved in local and regional EMS systems by providing training and clinical education resources (I-R, II-R, III-R, IV-R)

Time Critical Diagnosis (TCD) System Stroke Professional Education Work Group Recommendations

Recommendations from the TCD Professional Education Stroke Workgroup (October 2010 to July 2011)

Thank you to the members of the TCD Stroke Professional Education Workgroup who volunteered their time to identify the following recommendations and information. This workgroup's intent was to provide useful information for all designated TCD Stroke Centers.

The TCD Stroke Professional Education Workgroup has been established to review courses relevant to stroke credentialing, create a summary of available course sites and provide resource.

TCD Stroke Professional Education Workgroup Goals:

1. Identify core competencies that reflect appropriate patient care modalities for stroke patients.
2. Recognize national and state courses for relevant content related to stroke patient care competencies.
3. Site a catalog of resources to assist facilities in locating competency courses.
4. Establish overall venues related to TCD efforts that may be utilized for public education with regards to patient transport and the TCD effort in Missouri.

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Section I

Qualified Medical Professionals (QMP)

The TCD Stroke/STEMI Task Force recommends that the following Qualified Medical Professionals (QMP) who may be involved in direct stroke care, in addition to those staff identified in the stroke center regulations (19 CSR 30-40.730), receive stroke professional education:

Emergency Department:

- Emergency Physicians
- Hospitalists
- Residents
- Nurses
- Physician Assistant (PA)
- Advanced Practice Nurses

Physician:

- Radiologist
- Neurosurgeons
- Intensivist
- Neurologist

Stroke Team:

All members of the Stroke Team

Physical Medicine and Rehabilitation (PM&R)

Section II

TCD Stroke Center Professional Education Hour Requirements

From draft stroke center regulations on TCD website 1/19/2011

Center Designation Levels	I	II	III	IV
Emergency Department (ED) Nurse	4 per yr	4 per yr	6 every 2 yrs	6 every 2 yrs
ED Physician	4 per yr	4 per yr	6 every 2 yrs	6 every 2 yrs
Intensive Care Unit (ICU)	10 per yr	8 per yr	NA	NA
Stroke Unit	10 per yr	8 per yr	8 every 2 yrs	NA
Stroke Call Roster	10 per yr	8 per yr	8 every 2 yrs	8 every 2 yrs
Core Stroke Team	10 per yr	8 per yr	8 every 2 yrs	8 every 2 yrs
Stroke Medical Director	12 per yr	8 per yr	8 every 2 yrs	8 every 2 yrs
Stroke Program Manager	10 per yr AND 1 conference every 2yrs	8 per yr AND 1 conference every 3 yrs	8 every 2 yrs	8 every 2 yrs

The hour requirements are from draft regulations on TCD website 1/19/2011 (section 4, 19 CSR 30-40.730)

Hospitals are required to provide documentation related to completion of professional education requirements listed above.

Section III

Stroke Education for Other Hospital Staff

The TCD Stroke/STEMI Task Force recommends that Stroke Centers identify other professionals, in addition to those staff identified in the stroke center regulations (19 CSR 30-40.730), who would benefit by stroke professional education including, but not limited to:

- Primary Care Providers
- Rapid Response Team**
- Radiologists
- Neurologists
- Cardiologists
- Advanced Practice Nurses
- Physician Assistants
- Rehab
- Neurosurgery
- Pharmacy
- Laboratory
- Case management
- Social workers
- RN (all hospital staff)

**This TCD workgroup discussed that some stroke hospitals have a designated “Rapid Response Team” in addition to the Stroke Team.

TCD Stroke Centers may identify ancillary/unlicensed staff that would benefit by stroke professional education:

Suggestions include: technicians, certified nursing assistants, admitting staff, dietary, housekeeping, transporters, security and others. Information could include, but is not limited to:

- Recognizing stroke signs and symptoms
- Early activation in accordance with hospital protocol

Section IV

Core Competencies

TCD Professional Education: Stroke

The following are suggestions from the TCD Stroke Professional Education Workgroup for core competencies. Your selections should be based on the individual needs of your facility, TCD QA measures, and the goal of improving patient outcomes.

******The education should be tailored to the individual needs of your facility******

Knowledge of the processes specific to your facility, and knowledge of the state or community plan.

Awareness of “pre-hospital” and “intra-hospital” and “post-hospital” care in relation to your facility in the stroke process of the Time Critical Diagnosis 360°/365° Emergency Medical Care System Continuum

Stroke Team

- NIH Stroke Scale
- Thrombolytic Administration
- Cincinnati Pre-Hospital (FAST) Stroke Scale
- Other interventional procedures

All Designated TCD Stroke Centers

Last time seen normal

Brain Attack Coalition Benchmarks

- Door to emergency department physician.... (10 min)
- Door to Activation..... (15 min)
- Door to CT..... (25 min)
- Door to CT report..... (45 min)
- Door to thrombolytic..... (60 min)
- Door to lab/ Chest x-ray/ EKG...(complete in 45 min)

Core measure (quality indicators)

- DVT prophylaxis by end of hospital day 2
- Discharge on antiplatelet
- Antiplatelet therapy by end of hospital day 2
- Discharge on anticoagulation
- Thrombolytic considered
- Discharged on statin for LDL > 100 or home med continued
- Stroke education
- Rehabilitation consult

Dysphagia screen (prior to any oral intake including PO meds)

Blood pressure management

Patient Education

- Personal Risk Factors
- Importance of 911
- Physician follow-up
- Medication and compliance
- Signs and symptoms of stroke

Section V

TCD Stroke Center Professional Education Resource Catalog

Acute Stroke Science:

The Foundation for Quality Stroke Care in the Critical Access Hospital Setting

Presentation

Target Audience: Physicians, PA's Nurses, Stroke Coordinators, EMT's/Paramedics

Cost: Varies

CEU Credits: 2 Hour Activity; Michael Schneck, MD-overview of acute stroke science treatment recommendation and supporting science with emphasis on the acute stroke capable critical access hospital

Course Description: Overview of acute stroke science treatment recommendations and supporting science with emphasis on the acute stroke capable critical access hospital

Web Address: American Heart Association <http://www.learn.heart.org>

Advanced Stroke Life Support

Instructor Training Seminar

Target Audience: EMS Personal and Nurses and Providers

Cost: Varies

CEU Credits: 8 CEU

Course Description: Describe why early treatment may result in a marked reduction in risk of disability. Identify the five main stroke syndromes and relate them to pathophysiology and clinical signs. Perform focused evaluation to identify stroke, its location and severity, and t-PA contraindications.

Web Address: University of Miami Advanced Stroke Life Support WWW.ASLS.NET

American Association of Neuroscience Nurses

Online and self directed education

Target Audience: Nurses

Cost: Fees may apply

CEU Credits: 1.0 per module

Course Description: Several specific to stroke

Web Address: <http://www.aann.org>

Apex Innovations – Stroke Hemispheres

Online

Target Audience: Annual competency education

Cost: Fees may apply

CEU Credits: Varies

Course Descriptions: Several specific to stroke

Web Address: www.apexinnovations.com

General Electric – GE Healthcare**Target Audience:** Stroke Patient, Practitioner**Cost:** Fees may apply**CEU credits:** Varies**Course Description:** Varies. Currently no stroke professional education at this site.**Web Address:** <http://www.gehealthcare.com/usen/education/index.html>**Graduate Education Foundation****Online self directed education****Target Audience:** Nurses and Nurse Practitioners**Cost:** Fees may apply**CEU Credits:** 1.5**Course Description:** Defines and describes the mechanisms of completed stroke, transient ischemic attack (TIA), reversible ischemic neurologic deficit (RIND), and progressing or evolving stroke.**Web Address:** www.cmelectures.org**GWTG Data Collection & Performance Improvement for Primary Stroke Centers****Presentation****Target Audience:** Physicians, Nurses, Pharmacist, EMTs/ Paramedics, Quality Professionals, Lab & radiology, Speech and Rehab Professionals, CNO**Cost:** Fees may apply**CEU Credits:** 1Hour Activity; Kathleen O'Neil, MHA, Sr. Director, Quality Initiatives, Illinois & South Dakota AHA, Midwest Affiliate**Course Description:** Overview of the recommended treatment guidelines for the acute stroke patient.**Web Address:** American Heart Association <http://www.learn.heart.org>**Hemispheres, Stroke Competency Series****Web Courses****Target Audience:** All levels of staff including nurses, advanced practice nurses, physician assistants, physicians, paramedics and rehab clinicians Essential for orientation and continuing education for pre-hospital, emergency, neurology, stroke, critical care, telemetry, PACU and rehabilitation units**Cost:** Fees may apply**CEU Credits:** Varies**Course Description:** Hemispheres™ Stroke Competency Series is a multi-level, web-based educational series designed for healthcare professionals to stay up to date on the standards of care for stroke patients. This comprehensive program allows everyone from physicians to students to expand their knowledge and sharpen their skills - essential for orientation, annual competencies and continuing education.**Web Address:** Empower Learning Solutions; <http://www.empowerbpo.com/hemispheres.html>**Medscape****Online self directed education****Target Audience:** Nurses and Physicians**Cost:** Free**CEU Credits:** varies**Course Description:** Stroke topics across the continuum.**Web Address:** www.medscape.com

National Stroke Association

IPoC Learning

Target Audience: Neurologists, emergency medicine physicians, hospitalists, and other physicians who treat stroke patients

Cost: Some educational activities are available only to members of National Stroke Association's Stroke Center Network (SCN) and/or Stroke Rehabilitation and Recovery Network (SRN). For more information about these membership programs and how to join, please contact Linda Kuhrt at lkuhrt@stroke.org or 303.754.0934

CEU Credits: 0.5 per module

Course Description: Acute Stroke Treatment: New Evidence and Opportunities Preventing Recurrent Stroke: Targets for managing Risk

Web Address: www.stroke.org

National Stroke Association Online Learning

Webcast, Satellite Symposia Archive, Stroke Clinical Update

Target Audience: Neurologists, emergency medicine physicians, hospitalists and other physicians who treat stroke patients and nurses

Cost: Some classes are free, fees may apply to some modules

CEU Credits: 0.5-2.0 depending on module

Course Description: Stroke Nurse Education Modules, Stroke Rapid Response, NIHSS stroke Scale Certification, Swallow Screening Performance Improvement, Preventing Recurrent Stroke: Targets for Managing risk, Intra cerebral Hemorrhage in Acute Stroke, etc (over 17 different topics in all)

Web Address: www.stroke.org

NIHSS Certification

Online and self directed education

Target Audience: Physicians and Nurses

Cost: Varies

CEU Credits: Varies

Course Description: Acute Stroke Assessment

Web addresses: <http://www.learn.heart.org> ; www.trainingcampus.com ; www.nihstrokescale.org ; www.stroke.org

Nursing Spectrum

Online and self directed education

Target Audience: Nurses

Cost: Some are free, fees may apply for some

CEU Credits: varies

Course Description: Different aspects of stroke care

Web Address: <http://ce.nurse.com/>

PRIME

Online neuroscience topics

Target Audience: For the entire health care team

Cost: Free

CEU Credits: varies

Course Description: Topics include stroke, pain management, Parkinson's disease, TBI, multiple sclerosis

Web address: www.primeinc.org

Rehabilitation Considerations

Presentation

Target Audience: Physicians, Nurses, Stroke Coordinators, Pharmacist, EMT's/Paramedics, Quality Professionals, Lab & Radiology, Speech and Rehab Professionals, CNO

Cost: Fees may apply

CEU Credits: 90 minutes; Richard Harvey, MD, Medical Director, Stroke Program Rehabilitation Institute of Chicago

Course Description: Physiatric approach to the acute stroke patient, dysphagia/aspiration pneumonia, DVT prophylaxis, bladder/bowel management, aphasia - communication strategies, early mobilization, prognosis, selection of next level of care.

Web Address: American Heart Association <http://www.heart.org>

Telecommunication and Stroke

Webcast/Webinar

Target Audience: Physicians, Stroke Coordinators, Nurses, Pharmacist, EMTs/Paramedics, Lab & Radiology, Speech and Rehab Professionals, CNO

Cost: Fees may apply

CEU Credits: 60 minutes; Henry Echiverri, MD, Dept of Neurology Science, Central DuPage Hospital

Course Description: Overview telestroke models and AHA telestroke recommendation

Web Address: American Heart Association <http://www.heart.org>

Washington University

Online and self directed education

Target Audience: physicians and nurses

Cost: Free

CME: varies

Web Address: <https://cme-online.wustl.edu/>

Course Description: (subject to change)

Principles of Evidence Based Medicine

Evidence-Based Approach to Antithrombotic Treatment in Acute Ischemic Stroke

Evidence-Based Management of Intra cerebral Hemorrhage

Evidence-Based Approach to Antithrombotic Treatment for Secondary Stroke Prevention

Evidence-Based Review of Rehabilitation Strategies after Stroke

Evidence-Based Prevention and Treatment of Acute Neurological Complications after Acute Ischemic Stroke

Evidence-Based Approach to Medical Care of Acute Stroke

Evidence-Based Management of Aneurysmal Subarachnoid Hemorrhage

Evidence-Based Use of Antithrombotic Therapy in the Prevention of Cardio embolic Stroke

Evidence-Based Practice: Thrombolysis in Acute Ischemic Stroke

Evidence-Based Approach to Treatment of Atherosclerotic Carotid Disease

Evidence-Based Approach to Diagnostic Evaluation in Ischemic Stroke

Evidence-Based Approach to Risk Factor Management in Stroke

Evidence Based Approach to Stroke in the Young

Evidence-Based Pre-Hospital and Emergency Management of the Stroke Patient

Section VI

Additional Stroke and TCD Web Resources

National Resources:

Brain Attack Coalition www.stroke-site.org/

American Stroke Association www.strokeassociation.org

National Stroke Association www.stroke.org

National Institute of Neurological Disorders and Stroke www.ninds.nih.gov

Centers for Disease Control and Prevention, Heart Disease and Stroke Prevention www.cdc.gov/dhdsp

American Association of Neuroscience Nurses (AANN) www.aann.org/

Missouri State Resources:

Mo Department of Health and Senior Services (DHSS) www.health.mo.gov

DHSS Time Critical Diagnosis System
www.health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php

DHSS Heart Disease and Stroke Program (link to stroke site)
www.health.mo.gov/living/healthcondiseases/chronic/stroke/index.php
<http://health.mo.gov/living/index.php>
<http://health.mo.gov/living/lpha/index.php>

DHSS Bureau of Emergency Medical Services
www.health.mo.gov/safety/ems/index.php

Section VII

Stroke Professional Education

Definitions and Information

From proposed TCD regulations: Definitions and Abbreviations Relating to Stroke Centers (19CSR 30-40.710)

CME: Continuing medical education and refers to the highest level of continuing education approved by the Missouri State Medical Association, the Missouri Association of Osteopathic Physicians and Surgeons, the American Osteopathic Association, or the Accreditation Council for Continuing Medical Education.

Continuing Education: Education approved by a national and/or state professional organization and/or the stroke medical director.

Credentialed or credentialing: Is a hospital specific system of documenting and recognizing the qualifications of medical staff and nurses and authorizing the performance of certain procedures and establishing clinical privileges in the hospital setting.

From proposed TCD regulations for Stroke Center Designation (19 CSR 30-40.730):

(4) (D) A professional education outreach program shall be established in the region and outlying areas to provide training and other supports to improve care of stroke patients ((I-R, II-R, III-R)

(4) (E) A training program on caring for stroke patients shall be established for professionals in the stroke center (I-R, II-R, III-R, IV-R)

1. There shall be a hospital-approved procedure for training nurses and clinical staff to be credentialed in stroke care.
2. The stroke center shall have a mechanism to assure that all nurses providing care to stroke patients shall complete a minimum of required continuing education to become credentialed in stroke care as stated in these regulations; and
3. The content and format of any stroke continuing education courses developed and offered by a hospital shall be developed with the oversight of the stroke medical director. A copy of the course curriculum used shall be filed with the department.

(4) (F) The hospital shall be actively involved in local and regional EMS systems by providing training and clinical education resources (I-R, II-R, III-R, IV-R)

TCD Level I Stroke Center

General Standards for Stroke Center Designation (Note: This information was compiled from earlier drafts of the proposed rules and will require updating; this is informational and is not filed as part of the filed regulations.)

7/15/2011

Time Critical Diagnosis System (Trauma, Stroke, STEMI)

“Time Critical Diagnosis (TCD) System: A coordinated integrated group providing emergency medical care services using regionalization concepts to treat the diagnosis that are truly time critical. At this point, there is clear evidence that severe trauma, acute stroke, and STEMI outcomes can be improved by regionalized care incorporating specialty referral centers that are designated by an accrediting body. These conditions require quick assessment, diagnosis, and treatment. The system focuses on timely recognition, assessment and transport to a facility that can provide definitive care within the comprehensive care network. Within the TCD concept, it is more intuitive to coordinate the three arms of the system under one banner rather than have three separate arms. This allows resource sharing and coordination at many different levels that decreases duplication and costs.” **Missouri Time Critical Diagnosis System Task Force, August 2008**

Overview TCD Stroke Center Designation Levels

TCD Level I Stroke Center (Comprehensive)

- 24/7 physician coverage: stroke neurologist, vascular neurosurgeons, neuro-interventionalist
- 24/7 stroke team, specialized care and treatment of all types of stroke (ischemic and hemorrhagic)
- Specific inpatient care requirements - designated stroke beds/ICU beds, CT and lab 24/7
- Conducts research

TCD Level II Stroke Center (Primary)

- Process in place similar to that of Joint Commission certified Primary Stroke Centers
- 24/7 stroke team to administer tPA
- Written care protocols, neurosurgical care within 2 hours, designated stroke beds/ICU, CT and lab 24/7

TCD Level III Stroke Center (Drip and Ship)

- Fast assessment and capacity to initiate treatment and transfer to Level I or Level II
- Working relationship with Level I or Level II

TCD Level IV Stroke Center

- Process in place for fast assessment, then quick intra-facility transfer to Level I or II
- Working relationship Level I or Level II

TCD Level I Stroke Center (Note: this information is taken from draft proposed rules and will require updating)

Note:

“IH” after a standard indicates an in-house requirement

“IA” after a standard indicates an immediately (20 minutes) available requirement

“PA” after a standard indicates a promptly (30 minute) available requirement

GENERAL STANDARDS FOR STROKE CENTER DESIGNATION

- Commitment to quality stroke care
- Accept all stroke patients appropriate for the level of care provided at the hospital, regardless of race, sex, creed, or ability to pay
- Evidence of a stroke program available 24 hours a day, 7 days a week to evaluate and treat stroke patients and meet the following requirements:
 - **STROKE TEAM**
 - **Core team** to provide administrative oversight
 - Physician experienced in diagnosis and treating cerebrovascular disease, usually the stroke medical director; and
 - One other health care professional or qualified individual credentialed in stroke patient care as determined by the hospital, usually the stroke program manager/coordinator
 - **Clinical team** appropriate to the center level designation: neurologists, neuro-interventionalist, neurosurgeons, anesthesiologists, intensivists, emergency department physicians, and other stroke center clinical staff
 - **Stroke team** will have appropriate skill and proficiencies as evidenced by documenting:
 - Stroke team members meet position qualifications and CE requirements for the state and hospital
 - Core team and member of stroke call roster participate in at least half of the regular, ongoing stroke program peer review meetings as shown in meeting attendance documents
 - Stroke team members will participate in at least half of the regular, ongoing stroke program PI and patient safety meetings as shown in minutes and meeting attendance documents.
 - Stroke team members will document continued experience in management of sufficient numbers of stroke patients to maintain stroke skills as defined by the hospital, the stroke medical director and state regulations
 - Core team members will document a minimum of 10 hours of CE in cerebrovascular disease every year. All other member of the stroke call roster will document a minimum average of 10 hours of CE in cerebrovascular disease every year as determined appropriate by the stroke center medical director and as appropriate to the practitioner’s level of responsibility.
 - Stroke team will review regional outcome data on quality of patient care as part of the PI and patient safety process
 - Maintain a **MULTIDISCIPLINARY TEAM** in addition to the stroke team
 - Multidisciplinary team will include an appropriate representative from hospital units as appropriate for care of each stroke patient. May include but not limited to: administration, emergency medical services, ICU, radiology, pharmacy, laboratory, stroke unit, stroke rehab, and discharge planning

- Multidisciplinary team will attend at least half of the stroke program PI and patient safety meetings which will be documented in meeting minutes and attendance lists.

- Hospital will provide **NEURO-INTERVENTIONAL** laboratory, staffed by a neuro-interventional team available 24 hours a day, 7 days a week and consist of:
 - Neuro interventional specialist(s). Hospital credentialing committee will document that the neuro-interventional specialist(s) have completed appropriate training and conducted sufficient neuro-interventional procedures to obtain the necessary competence.
 - Other health care professionals as deemed necessary.
- Hospital will appoint a **STROKE MEDICAL DIRECTOR**.
 - Board certified or board admissible neurologist or other neuro-specialty trained physician
 - Those neurologists or other neuro-specialty trained physicians in the medical director position at the time state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or admissible shall be able to continue in this position
 - All new stroke medical directors appointed by the hospital effective 6 months after state regulations take effect shall be board –certified or board-admissible neurologists or other neuro-specialty trained physicians
 - Stroke Medical Director will have experience in treating stroke patients as evidenced by experience or training in at least one of the following:
 - Completion of a stroke fellowship
 - Participation (attendee or faculty) in 1 national or international or 2 regional or state stroke courses or conferences each year; or
 - 5 or more peer-reviewed publications on stroke
 - Stroke Medical Director will meet the following CME requirements:
 - 12 hours or more CME each year in the area of cerebrovascular disease
 - There will be a job description and organization chart depicting the relationship between the stroke medical director and other services
 - Stroke Medical Director is a member of the stroke call roster
 - Stroke Medical Director will be responsible for the oversight of the education and training of the medical and clinical staff in stroke care
 - Stroke Medical Director will participate in the stroke center’s research and publication projects.
- **STROKE PROGRAM MANAGER / COORDINATOR** who is a registered nurse or qualified individual
 - There will be a job description and organization chart depicting the relationship between the stroke program manager / coordinator and other services.
 - Stroke program manager / coordinator will have a minimum average of 10 hours of CE each year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner’s level of responsibility and attend 1 national, regional, or state meeting every other year in cerebrovascular disease. If the nation or regional meeting provides CE hours, those may count toward the yearly requirement.
 - Stroke program manager /coordinator will participate in the formal QI program.
- There will be a specific and well-organized system for rapidly notifying and activating the stroke team to evaluate patients presenting with symptoms suggestive of an acute stroke.
- The hospital will have a **ONE-CALL STROKE TEAM ACTIVATION PROTOCOL**. This protocol will establish the following:
 - Criteria used to triage stroke patients according to time of symptom onset
 - Persons authorized to notify stroke team members when a suspected stroke patient is en route or has arrived at the stroke center

- The method for immediate notification and the response requirements for stroke team members when a suspected stroke patient is en route to the stroke center (I-R/IA = immediately: 20 minutes availability)
- All members of the stroke call roster shall comply with the availability and response requirements per the hospital protocol and be in communication within 15 minutes of notification of the patient. If not on hospital premises, stroke call roster members shall carry electronic communication devices at all times to permit contact by the hospital. It is recommended that one member of the stroke team, per hospital protocol, be at the patient's bedside within 15 minutes of notification of the patient.
- Stroke centers will have a call roster providing 24 hours a day, 7 days a week neurology coverage or regional networking agreement with a Level I stroke center for telephone consult or telemedicine available within 15 minutes of notification of patient when a neurologist is not available on site
- Stroke centers will have transfer agreements between referring and receiving facilities
 - The hospital will have a one-call transfer protocol that establishes the criteria used to triage stroke patients and identifies the persons authorized to notify the designated stroke center
- **REHABILITATION** will be directed by a physician with board certification in physical medicine and rehabilitation or by other properly trained individuals (e.g., neurologist experienced in stroke rehab)
- **CONSULTS** for physical medical and rehabilitation, physical therapy, occupational therapy and speech therapy will be requested and completed when deemed medically necessary within 24-48 hours of admission
- The hospital will demonstrate that there is a plan for adequate **POST-DISCHARGE AND POST-TRANSFER** follow-up on stroke patients, including rehabilitation and repatriation, if indicated.
- **STROKE PATIENT LOG** which will contain:
 - Response times
 - Patient diagnosis
 - Treatment / actions
 - Outcomes
 - Number of patients
 - Benchmark indicators
- There will be a lighted designated **HELICOPTER LANDING AREA**
 - Will serve as the receiving and take off area for medical helicopter and will be cordoned off when in use from the general public
 - Recommended that the landing area be no more than 3 minutes from the ED
- Each stroke patient who is admitted transferred, or dies as a result of the stroke, (independent of hospital admission or hospital transfer status) will be entered into a **MISSOURI STROKE REGISTRY**.
 - Includes at least 1 code of the following ICD-9-CM codes: 433.01, 433.10, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436.00, 430.00 and 431.00
 - Registry will be submitted electronically in a format defined by the department, submitted quarterly, within 90 days after the quarter ends. The stroke registry must be current and complete.
- A **HOSPITAL DIVERSION PROTOCOL** will be maintained in accordance with state regulations. Hospital diversion information must be maintained to include date, length of time and reason for diversion.

MEDICAL STAFFING STANDARDS FOR STROKE CENTER DESIGNATION

- There will be a delineation of privileges for the neurologists, neurosurgeons and neuro-interventionalists, as applicable, made by the medical staff credentialing committee.
- Physicians who are credentialed by the hospital for stroke care shall be available as indicated:
 - Neurology: available for consultation within 15 minutes of patient notification
 - Neurosurgery
 - Neurosurgeon and back-up coverage on the call roster (1-R/PA=30 minute availability)
 - Neurosurgery staffing requirement may be fulfilled by a surgeon who has been approved by the chief of neurosurgery for care of stroke patients. The surgeon will be capable of initiating measures to stabilize the patient and perform diagnostic procedures

- Neuro-interventional specialist (I-R/PA=30 minute availability)
- Emergency department physician (I-R/IH= inhouse)
- Internal medicine (I-R/PA=30 minute availability)
- Diagnostic Radiology (I-R/IA=20 minute availability)
- Anesthesiology (I-R/PA=30 minute availability)
 - Anesthesiology staffing requirements may be fulfilled by anesthesiology residents or CRNA's, or anesthesia assistants capable of assessing emergent situations in stroke patients and of providing any indicated treatment including induction of anesthesia. When anesthesiology residents, anesthesia assistants, or CRNA's are used to fulfill availability requirements, the staff anesthesiologist on call will be advised and promptly available and present for all operative interventions and emergency airway conditions. The CRNA may proceed with life preserving therapy while the anesthesiologist is en route under the direction of the neurosurgeon, including induction of anesthesia.

STANDARDS FOR HOSPITAL RESOURCES AND CAPABILITIES FOR STROKE CENTER DESIGNATION

- **EMERGENCY DEPARTMENT standards**
 - ED staffing will ensure immediate and appropriate care of the stroke patient
 - Medical director of the ED will be board-certified or board-admissible in emergency medicine
 - Those ED physicians in the position at the time the state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible will be able to continue in this position
 - All new medical directors appointed by the hospital effective 6 months after the state regulations take effect will be board-certified or board-admissible in emergency medicine
 - There will be ED physician competent in stroke care covering the ED 24 hours a day, 7 days a week (in house)
 - The ED physician providing coverage will be current in cerebrovascular CME and each physician:
 - Document a minimum average of 4 hours of CME in cerebrovascular disease every year
 - There will be a written policy defining the relationship of the ED physicians to other physician members of the stroke team
 - All RN's assigned to the ED will be trained in stroke nursing (including NIHSS), and thrombolytic therapy with NIHSS certification recommended in Level I centers by the hospital within 1 year of assignment.
 - RN's will document a minimum of 4 hours of cerebrovascular disease CE every year
 - RN's will maintain core competencies in the care of the stroke patient yearly as determined by the hospital
 - The ED will have written care protocols for triage and treatment of acute stroke patients available to ED personnel and should be reviewed annually and revised as needed.
 - ED will have the following equipment for resuscitation and life support available:
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen and mechanical ventilator
 - Suction devices
 - Electrocardiograph (ECG), cardiac monitor and defibrillator
 - Central line insertion equipment
 - All standard IV fluids and administration devices including IV catheters and intraosseous
 - Drugs and supplies necessary for emergency care
 - Two-way communication link with EMS vehicles
 - End-tidal carbon dioxide monitor
 - Temperature control devices for patient and resuscitation fluids

- RN's will be credentialed yearly as determined by the hospital
- There will be written care protocols for identification and treatment of acute stroke patients (e.g. lytic and post-lytic management, hemorrhagic conversion according to current best evidence) available to personnel and should be reviewed annually and revised as needed
- Equipment for resuscitation and to provide supports for the stroke patient including, but not limited to;
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator and sources of oxygen
 - Suction devices
 - Telemetry, electrocardiograph, cardiac monitor and defibrillator
 - All standard IV fluids and administration devices and IV catheter
 - Drugs and supplies necessary for emergency care
- Documentation that all equipment is checked according to hospital preventive maintenance schedule
- **RADIOLOGICAL AND DIAGNOSTIC** capabilities for stroke center designation including a mechanism for prioritization of stroke patients and timely interpretation to aid in patient management will include
 - **Angiography** with interventional capability available 24 hours, 7 days a week (I-R/PA = 30 minute availability)
 - Cerebroangiography technologist on call and available 24 hours, 7 days a week within 60 minutes for routine procedures and within 30 minutes for emergent procedures
 - In-house **CT** (I-R/IA = 20 minute availability)
 - CT-perfusion (I-R/IA = 20 minute availability)
 - CT-angiography (I-R/IA = 20 minute availability)
 - CT technologist (I-R/IH= in house)
 - **MRI**
 - MRI-angiogram/MRI venography
 - MRI technologist on call and available 24 hours, 7 days a week within 60 minutes
 - Extra cranial US
 - Equipment and clinical staff to evaluate for vasospasm available within 60 minutes for routine evaluation and within 30 minutes for emergent evaluation
 - Trans Thoracic echo
 - Trans esophageal echo
 - Resuscitation equipment available to the radiology department
- Adequate physician and nursing personnel available with monitoring equipment to fully support the acute stroke patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department
- There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **OPERATING ROOM** personnel, equipment and procedures of all Level I stroke centers with neurosurgical capability will include, but not limited to
 - An operating room staff available 24 hours, 7 days a week (I-R/PA (30 minute availability)
 - Equipment including, but not limited to
 - Operating microscope
 - Thermal control equipment for patient and resuscitation fluids
 - X-ray capability
 - Instruments necessary to perform an open craniotomy
 - Monitoring equipment
 - Resuscitation equipment available to the operating room
 - There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **POST-ANESTHESIA RECOVERY ROOM (PAR)** standards for stroke center designation

- RN's and other essential personnel who are not on duty will be on call and available within 60 minutes 24 hours, 7 days a week
- RN's will maintain core competencies yearly as determined by the hospital
- Equipment for resuscitation and to provide life support for the stroke patient will include, but not limited to
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator, sources of oxygen and mechanical ventilator
 - Suction devices
 - Telemetry, ECG capability, cardiac monitor and defibrillator
 - All standard IV fluids and administration devices, including IV catheters
 - Drugs and supplies necessary for emergency care
- There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **CLINICAL LABORATORY SERVICES** will be available 24 hours, 7 days a week with timely availability of results
 - Standard analyses of blood, urine and other body fluids
 - Blood typing and cross-matching
 - Coagulation studies
 - Comprehensive blood bank or access to a community central blood bank and adequate hospital blood storage facilities
 - Blood gases and pH determinations
 - Blood chemistries
 - Written policy that the stroke patient receives priority
- There will be documentation of adequate **support services** in assisting the patient's family from the time of entry into the facility to the time of discharge
- The hospital will have a stroke rehabilitation program or a referral plan

STANDARDS FOR HOSPITAL PERFORMANCE IMPROVEMENT, PATIENT SAFETY, OUTREACH, PUBLIC EDUCATION AND TRAINING PROGRAMS FOR STROKE CENTER DESIGNATION

- There will be an ongoing **PI AND PATIENT SAFETY PROGRAM** designed to objectively and systematically monitor, review and evaluate the quality, timeliness and appropriateness of patient care, pursue opportunities to improve patient care and resolve identified problems
 - All stroke centers will collect, trend and electronically report to the state key data indicators as identified by the department, including but not limited to
 - Door to needle time
 - Percentage of patients presenting within the treatment window
 - Percentage of eligible patients treated with thrombolytics
 - A regular morbidity and mortality review at least quarterly
 - Regular reviews of the reports generated by the department from the Missouri stroke registry
 - Regular reviews of pre-hospital stroke care including inter-facility transfers
 - Participation in EMS regional system of stroke care as established by the department
 - Stroke patients receiving FDA-approved thrombolytic ("drip and ship") remaining greater than 90 minutes at the referring hospital prior to transfer will be reviewed as part of the PI and patient safety program
 - The receiving hospital will provide and monitor timely feedback to the EMS providers and referring hospital, if involved. This feedback will include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within 72 hours of admission to the hospital. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame will not apply
 - Review and monitor the core competencies of the physicians, practitioners and nurses
- **NEUROLOGY CLINICAL SUPPORT PROGRAM** will be established that provides physicians in the outlying region with telephone (or telemedicine) access to a neurologist 24 hours, 7 days a week

- **PATIENT AND PUBLIC EDUCATION PROGRAM** will be established to promote stroke prevention and signs and symptoms awareness
- **PROFESSIONAL EDUCATION OUTREACH PROGRAM** will be established in the region and outlying areas to provide training and other supports to improve care of stroke patients
- **TRAINING PROGRAM** on caring for stroke patients will be established for professionals in the stroke center
 - There will be a hospital approved procedure for training nurses and clinical staff to be credentialed in stroke care
 - Stroke center will have a mechanism to assure that all nurses providing care to stroke patients complete a minimum of required CE to become credentialed in stroke care as stated in the state regulations
 - The content and format of any stroke CE courses developed and offered by a hospital will be developed with the oversight of the stroke medical director. A copy of the course curriculum used will be filed with the department
- The hospital will be actively involved in **LOCAL AND REGIONAL EMS SYSTEMS** by providing training and clinical educational resources.

STANDARDS FOR THE PROGRAMS IN STROKE RESEARCH FOR STROKE CENTER DESIGNATION

- The hospital and its staff will support an ongoing research program in stroke as evidenced by any of the following: production of evidence based reviews of stroke program's process and clinical outcomes; publications in peer reviewed journals; reports of findings presented at regional, state or national meetings; receipt of grants for study of stroke care; or participation in multi-center studies
- The hospital will agree to cooperate and participate with the DHSS in conducting epidemiological studies and individual case studies for the purpose of developing stroke prevention programs.

TCD Stroke Center Professional Education (CME/CUE) requirements

The TCD Professional Education Stroke Workgroup used draft TCD Stroke Center regulations to compile information contained in the following chart.

<u>Designation Level</u>	<u>I</u>	<u>II</u>	<u>III</u>	<u>IV</u>
<u>ER Nurses</u>	<u>4 per yr</u>	4 per yr	6 q 2 yrs	6 q 2 yrs
<u>ER Physician</u>	<u>4 per yr</u>	4 per yr	6 q 2 yrs	6 q 2 yrs
<u>ICU</u>	<u>10 per yr</u>	8 per yr	NA	NA
<u>Stroke Unit</u>	<u>10 per yr</u>	8 per yr	8 q 2 yrs	NA
<u>Stroke Call Roster</u>	<u>10 per yr</u>	8 per yr	8 q 2 yrs	8 q 2 yrs
<u>Core Stroke Team</u>	<u>10 per yr</u>	8 per yr	8 q 2 yrs	8 q 2 yrs
<u>Stroke Medical Director</u>	<u>12 per yr</u>	8 per yr	8 q 2 yrs	8 q 2 yrs
<u>Stroke Program Manager</u>	<u>10 per yr AND conference 2 yrs</u>	8 per yr	<u>AND</u> 8 q 2 yrs conference 3 yrs	8 q 2 yrs

TCD Level II Stroke Center

General Standards for Stroke Center Designation (Note: This information was compiled from earlier drafts of the proposed rules and will require updating; this is informational and is not filed as part of the filed regulations.)

/15/2011

Time Critical Diagnosis System (Trauma, Stroke, STEMI)

“Time Critical Diagnosis (TCD) System: A coordinated integrated group providing emergency medical care services using regionalization concepts to treat the diagnosis that are truly time critical. At this point, there is clear evidence that severe trauma, acute stroke, and STEMI outcomes can be improved by regionalized care incorporating specialty referral centers that are designated by an accrediting body. These conditions require quick assessment, diagnosis, and treatment. The system focuses on timely recognition, assessment and transport to a facility that can provide definitive care within the comprehensive care network. Within the TCD concept, it is more intuitive to coordinate the three arms of the system under one banner rather than have three separate arms. This allows resource sharing and coordination at many different levels that decreases duplication and costs.” [Missouri Time Critical Diagnosis System Task Force, August 2008](#)

Overview TCD Stroke Center Designation Levels

TCD Level I Stroke Center (Comprehensive)

- 24/7 physician coverage: stroke neurologist, vascular neurosurgeons, neuro-interventionalist
- 24/7 stroke team, specialized care and treatment of all types of stroke (ischemic and hemorrhagic)
- Specific inpatient care requirements - designated stroke beds/ICU beds, CT and lab 24/7
- Conducts research

TCD Level II Stroke Center (Primary)

- *Process in place similar to that of Joint Commission certified Primary Stroke Centers*
- *24/7 stroke team to administer tPA*
- *Written care protocols, neurosurgical care within 2 hours, designated stroke beds/ICU, CT and lab 24/7*

TCD Level III Stroke Center (Drip and Ship)

- Fast assessment and capacity to initiate treatment and transfer to Level I or Level II
- Working relationship with Level I or Level II

TCD Level IV Stroke Center

- Process in place for fast assessment, then quick intra-facility transfer to Level I or II
- Working relationship Level I or Level II

TCD Level II Stroke Center (Note: this information is taken from draft proposed rules and will require updating)

Note:

“IH” after a standard indicates an in-house requirement

“IA” after a standard indicates an immediately (20 minutes) available requirement

“PA” after a standard indicates a promptly (30 minute) available requirement

GENERAL STANDARDS FOR STROKE CENTER DESIGNATION

- Commitment to quality stroke care
- Accept all stroke patients appropriate for the level of care provided at the hospital, regardless of race, sex, creed, or ability to pay
- Evidence of a stroke program available 24 hours a day, 7 days a week to evaluate and treat stroke patients and meet the following requirements:
 - **STROKE TEAM**
 - **Core team** to provide administrative oversight
 - Physician experienced in diagnosis and treating cerebrovascular disease, usually the stroke medical director; and
 - One other health care professional or qualified individual credentialed in stroke patient care as determined by the hospital, usually the stroke program manager/coordinator
 - **Clinical team** appropriate to the center level designation: neurologists, neuro-interventionalist, neurosurgeons, anesthesiologists, intensivists, emergency department physicians, and other stroke center clinical staff
 - **Stroke team** will have appropriate skill and proficiencies as evidenced by documenting:
 - Stroke team members meet position qualifications and CE requirements for the state and hospital
 - Core team and member of stroke call roster participate in at least half of the regular, ongoing stroke program peer review meetings as shown in meeting attendance documents
 - Stroke team members will participate in at least half of the regular, ongoing stroke program PI and patient safety meetings as shown in minutes and meeting attendance documents.
 - Stroke team members will document continued experience in management of sufficient numbers of stroke patients to maintain stroke skills as defined by the hospital, the stroke medical director and state regulations
 - Core team members will document a minimum of 8 hours of CE in cerebrovascular disease every year. All other member of the stroke call roster will document a minimum average of 8 hours of CE in cerebrovascular disease every year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility.
 - Stroke team will review regional outcome data on quality of patient care as part of the PI and patient safety process
 - Maintain a **MULTIDISCIPLINARY TEAM** in addition to the stroke team
 - Multidisciplinary team will include an appropriate representative from hospital units as appropriate for care of each stroke patient. May include but not limited to: administration, emergency medical services, ICU, radiology, pharmacy, laboratory, stroke unit, stroke rehab, and discharge planning
 - Multidisciplinary team will attend at least half of the stroke program PI and patient safety meetings which will be documented in meeting minutes and attendance lists.
- Hospital will appoint a **STROKE MEDICAL DIRECTOR**.
 - Board certified or board admissible physician with training and expertise in cerebrovascular disease

- Those physicians with training and expertise in cerebrovascular disease in the medical director position at the time state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible shall be able to continue in this position
 - All new stroke medical directors appointed by the hospital effective 6 months after state regulations take effect shall be board –certified or board-admissible physicians with training and expertise in cerebrovascular disease
 - Stroke Medical Director will have experience in treating stroke patients as evidenced by experience or training in at least one of the following:
 - Completion of a stroke fellowship
 - Participation (attendee or faculty) in 1 national or international or 2 regional or state stroke courses or conferences each year; or
 - 5 or more peer-reviewed publications on stroke
 - Stroke Medical Director will meet the following CME requirements:
 - 8 hours or more CME each year in the area of cerebrovascular disease
 - There will be a job description and organization chart depicting the relationship between the stroke medical director and other services
 - Stroke Medical Director is a member of the stroke call roster
 - Stroke Medical Director will be responsible for the oversight of the education and training of the medical and clinical staff in stroke care
- **STROKE PROGRAM MANAGER / COORDINATOR** who is a registered nurse or qualified individual
 - There will be a job description and organization chart depicting the relationship between the stroke program manager / coordinator and other services.
 - Stroke program manager / coordinator will have a minimum average of 8 hours of CE each year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner’s level of responsibility and attend 1 national, regional, or state meeting every 3 years in cerebrovascular disease. If the nation or regional meeting provides CE hours, those may count toward the yearly requirement.
 - Stroke program manager /coordinator will participate in the formal QI program.
- There will be a specific and well-organized system for rapidly notifying and activating the stroke team to evaluate patients presenting with symptoms suggestive of an acute stroke.
- The hospital will have a **ONE-CALL STROKE TEAM ACTIVATION PROTOCOL**. This protocol will establish the following:
 - Criteria used to triage stroke patients according to time of symptom onset
 - Persons authorized to notify stroke team members when a suspected stroke patient is en route or has arrived at the stroke center
 - The method for immediate notification and the response requirements for stroke team members when a suspected stroke patient is en route to the stroke center (I-R/IA = immediately: 20 minutes availability)
 - All members of the stroke call roster shall comply with the availability and response requirements per the hospital protocol and be in communication within 15 minutes of notification of the patient. If not on hospital premises, stroke call roster members shall carry electronic communication devices at all times to permit contact by the hospital. It is recommended that one member of the stroke team, per hospital protocol, be at the patient’s bedside within 15 minutes of notification of the patient.
 - Stroke centers will have a call roster providing 24 hours a day, 7 days a week neurology coverage or regional networking agreement with a Level I stroke center for telephone consult or telemedicine available within 15 minutes of notification of patient when a neurologist is not available on site
 - Stroke centers will have transfer agreements between referring and receiving facilities
 - The hospital will have a one-call transfer protocol that establishes the criteria used to triage stroke patients and identifies the persons authorized to notify the designated stroke center
 - The hospital will have a rapid transfer process in place to transport a stroke patient to a higher level of stroke care when needed.
- **REHABILITATION** will be directed by a physician with board certification in physical medicine and rehabilitation or by other properly trained individuals (e.g., neurologist experienced in stroke rehab)
- **CONSULTS** for physical medical and rehabilitation, physical therapy, occupational therapy and speech therapy will be requested and completed when deemed medically necessary within 24-48 hours of admission
- The hospital will demonstrate that there is a plan for adequate **POST-DISCHARGE AND POST-TRANSFER** follow-up on stroke patients, including rehabilitation and repatriation, if indicated.
- **STROKE PATIENT LOG** which will contain:

- Response times
- Patient diagnosis
- Treatment / actions
- Outcomes
- Number of patients
- Benchmark indicators
- There will be a lighted designated **HELICOPTER LANDING AREA**
 - Will serve as the receiving and take off area for medical helicopter and will be cordoned off when in use from the general public
 - Recommended that the landing area be no more than 3 minutes from the ED
- Each stroke patient who is admitted transferred, or dies as a result of the stroke, (independent of hospital admission or hospital transfer status) will be entered into a **MISSOURI STROKE REGISTRY**.
 - Includes at least 1 code of the following ICD-9-CM codes: 433.01, 433.10, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436.00, 430.00 and 431.00
 - Registry will be submitted electronically in a format defined by the department, submitted quarterly, within 90 days after the quarter ends. The stroke registry must be current and complete.
- A **HOSPITAL DIVERSION PROTOCOL** will be maintained in accordance with state regulations. Hospital diversion information must be maintained to include date, length of time and reason for diversion.

MEDICAL STAFFING STANDARDS FOR STROKE CENTER DESIGNATION

- There will be a delineation of privileges for the neurologists, neurosurgeons and neuro-interventionalists, as applicable, made by the medical staff credentialing committee.
- Physicians who are credentialed by the hospital for stroke care shall be available as indicated:
 - Physician with experience and expertise in diagnosing and treating patients with cerebrovascular disease available for consultation within 15 minutes of patient notification
 - Neurosurgery
 - Neurosurgeon and back-up coverage on the call roster or available within 2 hours by transfer agreement if not on staff
 - Neurosurgery staffing requirement may be fulfilled by a surgeon who has been approved by the chief of neurosurgery for care of stroke patients. The surgeon will be capable of initiating measures to stabilize the patient and perform diagnostic procedures
 - Emergency department physician (II-R/IH= inhouse)
 - Internal medicine (II-R/PA=30 minute availability)
 - Diagnostic Radiology (II-R/IA=20 minute availability)
 - Anesthesiology (II-R/PA=30 minute availability)
 - Anesthesiology staffing requirements may be fulfilled by anesthesiology residents or CRNA's, or anesthesia assistants capable of assessing emergent situations in stroke patients and of providing any indicated treatment including induction of anesthesia. When anesthesiology residents, anesthesia assistants, or CRNA's are used to fulfill availability requirements, the staff anesthesiologist on call will be advised and promptly available and present for all operative interventions and emergency airway conditions. The CRNA may proceed with life preserving therapy while the anesthesiologist is en route under the direction of the neurosurgeon, including induction of anesthesia.

STANDARDS FOR HOSPITAL RESOURCES AND CAPABILITIES FOR STROKE CENTER DESIGNATION

- **EMERGENCY DEPARTMENT** standards
 - ED staffing will ensure immediate and appropriate care of the stroke patient
 - Medical director of the ED will be board-certified or board-admissible physician
 - Those physicians in the position at the time the state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible will be able to continue in this position

- All new medical directors appointed by the hospital effective 6 months after the state regulations take effect will be board-certified or board-admissible physician
- There will be ED physician competent in stroke care covering the ED 24 hours a day, 7 days a week (in house)
- The ED physician providing coverage will be current in cerebrovascular CME and each physician:
 - Document a minimum average of 4 hours of CME in cerebrovascular disease every year
- There will be a written policy defining the relationship of the ED physicians to other physician members of the stroke team
- All RN's assigned to the ED will be trained in stroke nursing (including NIHSS), and thrombolytic therapy with NIHSS certification recommended in Level I centers by the hospital within 1 year of assignment.
 - RN's will document a minimum of 4 hours of cerebrovascular disease CE every year
 - RN's will maintain core competencies in the care of the stroke patient yearly as determined by the hospital
- The ED will have written care protocols for triage and treatment of acute stroke patients available to ED personnel and should be reviewed annually and revised as needed.
- ED will have the following equipment for resuscitation and life support available:
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen and mechanical ventilator
 - Suction devices
 - Electrocardiograph (ECG), cardiac monitor and defibrillator
 - Central line insertion equipment
 - All standard IV fluids and administration devices including IV catheters and intraosseous
 - Drugs and supplies necessary for emergency care
 - Two-way communication link with EMS vehicles
 - End-tidal carbon dioxide monitor
 - Temperature control devices for patient and resuscitation fluids
- There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- Designated **INTENSIVE CARE UNIT** for stroke center designation
 - The ICU will ensure staffing to provide appropriate care of the stroke patient
 - There will be a designated medical director for the ICU who has 24 hour, 7 day a week access to a physician knowledgeable in stroke who meets the DE requirements for the state regulations
 - A physician who is not the ED physician will be on duty in the ICU or available 24 hours, 7 days a week (I-R/IA=20 minute availability)
 - The RN/patient ratio used for critically ill patients requiring ICU level care will be 1:1 or 2:1.
 - RN's will have a minimum of 8 hours of cerebrovascular related CE per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level or responsibility
 - RN's will meet core credentials for care of stroke patients on a yearly basis in a manner determined by the hospital, including, but not limited to:
 - Care of patients after thrombolytic therapy
 - Treatment of BP abnormalities with parenteral vasoactive agents
 - Management of intubated / ventilated patients
 - Detailed neurologic assessment and scales (i.e. NIHSS, GCS)
 - Care of patients with ICH and SAH at all Level I centers with neurosurgical capability
 - Function of ventriculostomy and external ventricular drainage apparatus in all Level I centers with neurosurgical capability
 - Treatment of ICP in all Level I centers with neurosurgical capability
 - The ICU will have written care protocols for identification and treatment of acute stroke patients available to ICU personnel and should be reviewed annually and revised as needed
 - There will be beds for stroke patients or comparable level of care provided until space is available in the ICU.
 - Equipment for resuscitation and to provide life support for the stroke patient will be available for the ICU. Includes, but not limited to:
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, and a mechanical ventilator
 - Oxygen source with concentration control

- Cardiac emergency cart, including medications
 - Telemetry, ECG capability, cardiac monitor and defibrillator
 - Electronic pressure monitoring and pulse oximetry
 - End-tidal carbon dioxide monitor
 - Patient weighing devices
 - Drugs, IV fluids, and supplies
 - Intracranial pressure monitoring devices
- There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **Stroke Unit** in a Level II stroke center and the designated stroke beds of a Level III stroke center that keeps patients under a supervised relationship with a Level I or Level II stroke center will have the following personnel and equipment
 - Designated medical director who meets the continuing educational requirements set by the state
 - A physician who is not the ED physician will be on duty or available 24 hours, 7 days a week (I-R/IA = 20 minute availability)
 - RN's and other essential personnel on duty 24 hours, 7 days a week
 - RN's will document a minimum of 8 hours of cerebrovascular disease CE per year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility
 - RN's will be credentialed yearly as determined by the hospital
 - There will be written care protocols for identification and treatment of acute stroke patients (e.g. lytic and post-lytic management, hemorrhagic conversion according to current best evidence) available to personnel and should be reviewed annually and revised as needed
 - Equipment for resuscitation and to provide supports for the stroke patient including, but not limited to;
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator and sources of oxygen
 - Suction devices
 - Telemetry, electrocardiograph, cardiac monitor and defibrillator
 - All standard IV fluids and administration devices and IV catheter
 - Drugs and supplies necessary for emergency care
 - Documentation that all equipment is checked according to hospital preventive maintenance schedule
- **RADIOLOGICAL AND DIAGNOSTIC** capabilities for stroke center designation including a mechanism for prioritization of stroke patients and timely interpretation to aid in patient management will include
 - In-house **CT** (II-R/IA = 20 minute availability)
 - CT technologist (II-R/IH= in house)
 - **MRI**
 - MRI-angiogram/MRI venography
 - MRI technologist on call and available 24 hours, 7 days a week within 60 minutes
 - Extra cranial US
 - Trans Thoracic echo
 - Trans esophageal echo
 - Resuscitation equipment available to the radiology department
 - Adequate physician and nursing personnel available with monitoring equipment to fully support the acute stroke patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department
 - There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **OPERATING ROOM** personnel, equipment and procedures of all Level II stroke centers with neurosurgical capability will include, but not limited to
 - An operating room staff available 24 hours, 7 days a week (II-R/PA (30 minute availability)
 - Equipment including, but not limited to
 - Operating microscope
 - Thermal control equipment for patient and resuscitation fluids
 - X-ray capability
 - Instruments necessary to perform an open craniotomy
 - Monitoring equipment
 - Resuscitation equipment available to the operating room

- There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **POST-ANESTHESIA RECOVERY ROOM (PAR)** standards for stroke center designation (all Level II stroke centers with neurosurgical capability)
 - RN's and other essential personnel who are not on duty will be on call and available within 60 minutes 24 hours, 7 days a week
 - RN's will maintain core competencies yearly as determined by the hospital
 - Equipment for resuscitation and to provide life support for the stroke patient will include, but not limited to
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator, sources of oxygen and mechanical ventilator
 - Suction devices
 - Telemetry, ECG capability, cardiac monitor and defibrillator
 - All standard IV fluids and administration devices, including IV catheters
 - Drugs and supplies necessary for emergency care
 - There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **CLINICAL LABORATORY SERVICES** will be available 24 hours, 7 days a week with timely availability of results
 - Standard analyses of blood, urine and other body fluids
 - Blood typing and cross-matching
 - Coagulation studies
 - Comprehensive blood bank or access to a community central blood bank and adequate hospital blood storage facilities
 - Blood gases and pH determinations
 - Blood chemistries
 - Written policy that the stroke patient receives priority
- There will be documentation of adequate **support services** in assisting the patient's family from the time of entry into the facility to the time of discharge
- The hospital will have a stroke rehabilitation program or a referral plan

STANDARDS FOR HOSPITAL PERFORMANCE IMPROVEMENT, PATIENT SAFETY, OUTREACH, PUBLIC EDUCATION AND TRAINING PROGRAMS FOR STROKE CENTER DESIGNATION

- There will be an ongoing **PI AND PATIENT SAFETY PROGRAM** designed to objectively and systematically monitor, review and evaluate the quality, timeliness and appropriateness of patient care, pursue opportunities to improve patient care and resolve identified problems
 - All stroke centers will collect, trend and electronically report to the state key data indicators as identified by the department, including but not limited to
 - Door to needle time
 - Percentage of patients presenting within the treatment window
 - Percentage of eligible patients treated with thrombolytics
 - A regular morbidity and mortality review at least quarterly
 - Regular reviews of the reports generated by the department from the Missouri stroke registry
 - Regular reviews of pre-hospital stroke care including inter-facility transfers
 - Participation in EMS regional system of stroke care as established by the department
 - Stroke patients receiving FDA-approved thrombolytic ("drip and ship") remaining greater than 90 minutes at the referring hospital prior to transfer will be reviewed as part of the PI and patient safety program
 - The receiving hospital will provide and monitor timely feedback to the EMS providers and referring hospital, if involved. This feedback will include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within 72 hours of admission to the hospital. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame will not apply
 - Review and monitor the core competencies of the physicians, practitioners and nurses
- **NEUROLOGY CLINICAL SUPPORT PROGRAM** will be established that provides physicians in the outlying region with telephone (or telemedicine) access to a neurologist 24 hours, 7 days a week

- **PATIENT AND PUBLIC EDUCATION PROGRAM** will be established to promote stroke prevention and signs and symptoms awareness
- **PROFESSIONAL EDUCATION OUTREACH PROGRAM** will be established in the region and outlying areas to provide training and other supports to improve care of stroke patients
- **TRAINING PROGRAM** on caring for stroke patients will be established for professionals in the stroke center
 - There will be a hospital approved procedure for training nurses and clinical staff to be credentialed in stroke care
 - Stroke center will have a mechanism to assure that all nurses providing care to stroke patients complete a minimum of required CE to become credentialed in stroke care as stated in the state regulations
 - The content and format of any stroke CE courses developed and offered by a hospital will be developed with the oversight of the stroke medical director. A copy of the course curriculum used will be filed with the department
- The hospital will be actively involved in **LOCAL AND REGIONAL EMS SYSTEMS** by providing training and clinical educational resources.

STANDARDS FOR THE PROGRAMS IN STROKE RESEARCH FOR STROKE CENTER DESIGNATION

- The hospital will agree to cooperate and participate with the DHSS in conducting epidemiological studies and individual case studies for the purpose of developing stroke prevention programs.

TCD Stroke Center Professional Education (CME/CUE) requirements

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<u>Designation Level</u>	I	II	III	IV
<u>ER Nurses</u>	4 per yr	<u>4 per yr</u>	6 q 2 yrs	6 q 2 yrs
<u>ER Physician</u>	4 per yr	<u>4 per yr</u>	6 q 2 yrs	6 q 2 yrs
<u>ICU</u>	10 per yr	<u>8 per yr</u>	NA	NA
<u>Stroke Unit</u>	10 per yr	<u>8 per yr</u>	8 q 2 yrs	NA
<u>Stroke Call Roster</u>	10 per yr	<u>8 per yr</u>	8 q 2 yrs	8 q 2 yrs
<u>Core Stroke Team</u>	10 per yr	<u>8 per yr</u>	8 q 2 yrs	8 q 2 yrs
<u>Stroke Medical Director</u>	12 per yr	<u>8 per yr</u>	8 q 2 yrs	8 q 2 yrs
<u>Stroke Program Manager</u>	10 per yr <u>AND</u> conference q 2	<u>8 per yr AND</u> <u>conference 3 yrs</u>	8 q 2 yrs	8 q 2 yrs

TCD Level III Stroke Center

General Standards for Stroke Center Designation (Note: This information was compiled from earlier drafts of the proposed rules and will require updating; this is informational and is not filed as part of the filed regulations.)

7/15/2011

Time Critical Diagnosis System (Trauma, Stroke, STEMI)

“Time Critical Diagnosis (TCD) System: A coordinated integrated group providing emergency medical care services using regionalization concepts to treat the diagnosis that are truly time critical. At this point, there is clear evidence that severe trauma, acute stroke, and STEMI outcomes can be improved by regionalized care incorporating specialty referral centers that are designated by an accrediting body. These conditions require quick assessment, diagnosis, and treatment. The system focuses on timely recognition, assessment and transport to a facility that can provide definitive care within the comprehensive care network. Within the TCD concept, it is more intuitive to coordinate the three arms of the system under one banner rather than have three separate arms. This allows resource sharing and coordination at many different levels that decreases duplication and costs.” [Missouri Time Critical Diagnosis System Task Force, August 2008](#)

Overview TCD Stroke Center Designation Levels

TCD Level I Stroke Center (Comprehensive)

- 24/7 physician coverage: stroke neurologist, vascular neurosurgeons, neuro-interventionalists
- 24/7 stroke team, specialized care and treatment of all types of stroke (ischemic and hemorrhagic)
- Specific inpatient care requirements - designated stroke beds/ICU beds, CT and lab 24/7
- Conducts research

TCD Level II Stroke Center (Primary)

- Process in place similar to that of Joint Commission certified Primary Stroke Centers
- 24/7 stroke team to administer tPA
- Written care protocols, neurosurgical care within 2 hours, designated stroke beds/ICU, CT and lab 24/7

TCD Level III Stroke Center (Drip and Ship)

- **Fast assessment and capacity to initiate treatment and transfer to Level I or Level II**
- **Working relationship with Level I or Level II**

TCD Level IV Stroke Center

- Process in place for fast assessment, then quick intra-facility transfer to Level I or II
- Working relationship Level I or Level II

TCD Level III Stroke Center (Note: this information is taken from draft proposed rules and will require updating)

Note:

“IH” after a standard indicates an in-house requirement

“IA” after a standard indicates an immediately (20 minutes) available requirement

“PA” after a standard indicates a promptly (30 minute) available requirement

GENERAL STANDARDS FOR STROKE CENTER DESIGNATION

- Commitment to quality stroke care
- Accept all stroke patients appropriate for the level of care provided at the hospital, regardless of race, sex, creed, or ability to pay
- Evidence of a stroke program available 24 hours a day, 7 days a week to evaluate and treat stroke patients and meet the following requirements:
 - **STROKE TEAM**
 - **Core team** to provide administrative oversight
 - Physician experienced in diagnosis and treating cerebrovascular disease, usually the stroke medical director; and
 - One other health care professional or qualified individual credentialed in stroke patient care as determined by the hospital, usually the stroke program manager/coordinator
 - **Clinical team** appropriate to the center level designation: neurologists, neuro-interventionalist, neurosurgeons, anesthesiologists, intensivists, emergency department physicians, and other stroke center clinical staff
 - **Stroke team** will have appropriate skill and proficiencies as evidenced by documenting:
 - Stroke team members meet position qualifications and CE requirements for the state and hospital
 - Core team and member of stroke call roster participate in at least half of the regular, ongoing stroke program peer review meetings as shown in meeting attendance documents
 - Stroke team members will participate in at least half of the regular, ongoing stroke program PI and patient safety meetings as shown in minutes and meeting attendance documents.
 - Stroke team members will document continued experience in management of sufficient numbers of stroke patients to maintain stroke skills as defined by the hospital, the stroke medical director and state regulations
 - All members of the stroke call roster will document a minimum average of 8 hours of CE in cerebrovascular disease every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner’s level of responsibility
 - Stroke team will review regional outcome data on quality of patient care as part of the PI and patient safety process
 - Maintain a **MULTIDISCIPLINARY TEAM** in addition to the stroke team
 - Multidisciplinary team will include an appropriate representative from hospital units as appropriate for care of each stroke patient. May include but not limited to: administration, emergency medical services, ICU, radiology, pharmacy, laboratory, stroke unit, stroke rehab, and discharge planning
 - Multidisciplinary team will attend at least half of the stroke program PI and patient safety meetings which will be documented in meeting minutes and attendance lists.
- Hospital will appoint a **STROKE MEDICAL DIRECTOR**.
 - Board certified or board admissible physician
 - Those physicians in the medical director position at the time state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible shall be able to continue in this position
- All new stroke medical directors appointed by the hospital effective 6 months after state regulations take effect shall be board –certified or board-admissible physicians

- Stroke Medical Director will meet the following CME requirements:
 - 8 hours or more CME every other year in the area of cerebrovascular disease
- There will be a job description and organization chart depicting the relationship between the stroke medical director and other services
- Stroke Medical Director is a member of the stroke call roster
- Stroke Medical Director will be responsible for the oversight of the education and training of the medical and clinical staff in stroke care
- **STROKE PROGRAM MANAGER / COORDINATOR** who is a registered nurse or qualified individual
 - There will be a job description and organization chart depicting the relationship between the stroke program manager / coordinator and other services.
 - Stroke program manager / coordinator will have a minimum average of 8 hours of CE every other year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility
 - Stroke program manager /coordinator will participate in the formal QI program.
- There will be a specific and well-organized system for rapidly notifying and activating the stroke team to evaluate patients presenting with symptoms suggestive of an acute stroke.
- The hospital will have a **ONE-CALL STROKE TEAM ACTIVATION PROTOCOL**. This protocol will establish the following:
 - Criteria used to triage stroke patients according to time of symptom onset
 - Persons authorized to notify stroke team members when a suspected stroke patient is en route or has arrived at the stroke center
 - The method for immediate notification and the response requirements for stroke team members when a suspected stroke patient is en route to the stroke center (I-R/IA = immediately: 20 minutes availability)
 - All members of the stroke call roster shall comply with the availability and response requirements per the hospital protocol and be in communication within 15 minutes of notification of the patient. If not on hospital premises, stroke call roster members shall carry electronic communication devices at all times to permit contact by the hospital. It is recommended that one member of the stroke team, per hospital protocol, be at the patient's bedside within 15 minutes of notification of the patient.
 - Stroke centers will have a call roster providing 24 hours a day, 7 days a week neurology coverage or regional networking agreement with a Level I stroke center for telephone consult or telemedicine available within 15 minutes of notification of patient when a neurologist is not available on site
 - Stroke centers will have transfer agreements between referring and receiving facilities
 - The hospital will have a one-call transfer protocol that establishes the criteria used to triage stroke patients and identifies the persons authorized to notify the designated stroke center
 - The hospital will have a rapid transfer process in place to transport a stroke patient to a higher level of stroke care when needed.
- The hospital will demonstrate that there is a plan for adequate **POST-DISCHARGE AND POST-TRANSFER** follow-up on stroke patients, including rehabilitation and repatriation, if indicated.
- **STROKE PATIENT LOG** which will contain:
 - Response times
 - Patient diagnosis
 - Treatment / actions
 - Outcomes
 - Number of patients
 - Benchmark indicators
- There will be a lighted designated **HELICOPTER LANDING AREA**
 - Will serve as the receiving and take off area for medical helicopter and will be cordoned off when in use from the general public
 - Recommended that the landing area be no more than 3 minutes from the ED
- Each stroke patient who is admitted transferred, or dies as a result of the stroke, (independent of hospital admission or hospital transfer status) will be entered into a **MISSOURI STROKE REGISTRY**.
 - Includes at least 1 code of the following ICD-9-CM codes: 433.01, 433.10, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436.00, 430.00 and 431.00
 - Registry will be submitted electronically in a format defined by the department, submitted quarterly, within 90 days after the quarter ends. The stroke registry must be current and complete.
- A **HOSPITAL DIVERSION PROTOCOL** will be maintained in accordance with state regulations. Hospital diversion information must be maintained to include date, length of time and reason for diversion.

MEDICAL STAFFING STANDARDS FOR STROKE CENTER DESIGNATION

- Physicians who are credentialed by the hospital for stroke care shall be available as indicated:
 - Physician with experience and expertise in diagnosing and treating patients with cerebrovascular disease available for consultation within 15 minutes of patient notification
 - Physicians who are credentialed by the hospital for stroke care will be available as indicated
 - Emergency department physician (II-R/IH= inhouse)
 - Internal medicine (III-R/PA=30 minute availability)
 - Diagnostic Radiology (III-R/IA=20 minute availability)

STANDARDS FOR HOSPITAL RESOURCES AND CAPABILITIES FOR STROKE CENTER DESIGNATION

- **EMERGENCY DEPARTMENT** standards
 - ED staffing will ensure immediate and appropriate care of the stroke patient
 - Medical director of the ED will be board-certified or board-admissible physician
 - Those physicians in the position at the time the state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible will be able to continue in this position
 - All new medical directors appointed by the hospital effective 6 months after the state regulations take effect will be board-certified or board-admissible physician
 - There will be ED physician competent in stroke care covering the ED 24 hours a day, 7 days a week (in house)
 - The ED physician providing coverage will be current in cerebrovascular CME and each physician:
 - Document a minimum average of 6 hours of CME in cerebrovascular disease every other year
 - There will be a written policy defining the relationship of the ED physicians to other physician members of the stroke team
 - All RN's assigned to the ED will be trained in stroke nursing (including NIHSS), and thrombolytic therapy with NIHSS certification recommended in Level I centers by the hospital within 1 year of assignment.
 - RN's will document a minimum of 6 hours of cerebrovascular disease CE every other year
 - RN's will maintain core competencies in the care of the stroke patient yearly as determined by the hospital
 - The ED will have written care protocols for triage and treatment of acute stroke patients available to ED personnel and should be reviewed annually and revised as needed.
 - ED will have the following equipment for resuscitation and life support available:
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen and mechanical ventilator
 - Suction devices
 - Electrocardiograph (ECG), cardiac monitor and defibrillator
 - Central line insertion equipment
 - All standard IV fluids and administration devices including IV catheters and intraosseous
 - Drugs and supplies necessary for emergency care
 - Two-way communication link with EMS vehicles
 - End-tidal carbon dioxide monitor
 - Temperature control devices for patient and resuscitation fluids
 - There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule

- **Stroke Unit** in a Level I and Level II stroke center and the designated stroke beds of a Level III stroke center that keeps patients under a supervised relationship with a Level I or Level II stroke center will have the following personnel and equipment
 - Designated medical director who meets the continuing educational requirements set by the state
 - A physician who is not the ED physician will be on duty or available 24 hours, 7 days a week (I-R/IA = 20 minute availability)
 - RN's and other essential personnel on duty 24 hours, 7 days a week
 - RN's will document a minimum of 8 hours of cerebrovascular disease CE every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility
 - RN's will be credentialed yearly as determined by the hospital
 - There will be written care protocols for identification and treatment of acute stroke patients (e.g. lytic and post-lytic management, hemorrhagic conversion according to current best evidence) available to personnel and should be reviewed annually and revised as needed
 - Equipment for resuscitation and to provide supports for the stroke patient including, but not limited to;
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes of all sizes, bag-mask resuscitator and sources of oxygen
 - Suction devices
 - Telemetry, electrocardiograph, cardiac monitor and defibrillator
 - All standard IV fluids and administration devices and IV catheter
 - Drugs and supplies necessary for emergency care
 - Documentation that all equipment is checked according to hospital preventive maintenance schedule
- **RADIOLOGICAL AND DIAGNOSTIC** capabilities for stroke center designation including a mechanism for prioritization of stroke patients and timely interpretation to aid in patient management will include
 - In-house **CT** (II-R/IA = 20 minute availability)
 - CT technologist (II-R/IH= in house)
 - Resuscitation equipment available to the radiology department
 - Adequate physician and nursing personnel available with monitoring equipment to fully support the acute stroke patient and provide documentation of care during the time the patient is physically present in the radiology department and during transportation to and from the radiology department
- **CLINICAL LABORATORY SERVICES** will be available 24 hours, 7 days a week with timely availability of results
 - Standard analyses of blood, urine and other body fluids
 - Blood typing and cross-matching
 - Coagulation studies
 - Comprehensive blood bank or access to a community central blood bank and adequate hospital blood storage facilities
 - Blood gases and pH determinations
 - Blood chemistries
 - Written policy that the stroke patient receives priority
- There will be documentation of adequate **support services** in assisting the patient's family from the time of entry into the facility to the time of discharge
- The hospital will have a stroke rehabilitation program or a referral plan

STANDARDS FOR HOSPITAL PERFORMANCE IMPROVEMENT, PATIENT SAFETY, OUTREACH, PUBLIC EDUCATION AND TRAINING PROGRAMS FOR STROKE CENTER DESIGNATION

- There will be an ongoing **PI AND PATIENT SAFETY PROGRAM** designed to objectively and systematically monitor, review and evaluate the quality, timeliness and appropriateness of patient care, pursue opportunities to improve patient care and resolve identified problems
 - All stroke centers will collect, trend and electronically report to the state key data indicators as identified by the department, including but not limited to
 - Door to needle time
 - Percentage of patients presenting within the treatment window
 - Percentage of eligible patients treated with thrombolytics
 - A regular morbidity and mortality review at least quarterly
 - Regular reviews of the reports generated by the department from the Missouri stroke registry
 - Regular reviews of pre-hospital stroke care including inter-facility transfers
 - Participation in EMS regional system of stroke care as established by the department

- Stroke patients receiving FDA-approved thrombolytic (“drip and ship”) remaining greater than 90 minutes at the referring hospital prior to transfer will be reviewed as part of the PI and patient safety program
- Stroke patients not receiving FDA-approved thrombolytic remaining greater than 60 minutes at the referring hospital prior to transfer will be reviewed as part of the PI and patient safety program
- The receiving hospital will provide and monitor timely feedback to the EMS providers and referring hospital, if involved. This feedback will include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within 72 hours of admission to the hospital. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame will not apply
- Review and monitor the core competencies of the physicians, practitioners and nurses
- **PATIENT AND PUBLIC EDUCATION PROGRAM** will be established to promote stroke prevention and signs and symptoms awareness
- **PROFESSIONAL EDUCATION OUTREACH PROGRAM** will be established in the region and outlying areas to provide training and other supports to improve care of stroke patients
- **TRAINING PROGRAM** on caring for stroke patients will be established for professionals in the stroke center
 - There will be a hospital approved procedure for training nurses and clinical staff to be credentialed in stroke care
 - Stroke center will have a mechanism to assure that all nurses providing care to stroke patients complete a minimum of required CE to become credentialed in stroke care as stated in the state regulations
 - The content and format of any stroke CE courses developed and offered by a hospital will be developed with the oversight of the stroke medical director. A copy of the course curriculum used will be filed with the department
- The hospital will be actively involved in **LOCAL AND REGIONAL EMS SYSTEMS** by providing training and clinical educational resources.

STANDARDS FOR THE PROGRAMS IN STROKE RESEARCH FOR STROKE CENTER DESIGNATION

- The hospital will agree to cooperate and participate with the DHSS in conducting epidemiological studies and individual case studies for the purpose of developing stroke prevention programs.

TCD Stroke Center Professional Education (CME/CUE) requirements

The TCD Professional Education Stroke Workgroup used draft TCD Stroke Center regulations to compile information contained in the following chart.

<u>Designation Levels</u>	I	II	III	IV
<u>ER Nurses</u>	4 per yr	4 per yr	<u>6 q 2 yrs</u>	6 q 2 yrs
<u>ER Physician</u>	4 per yr	4 per yr	<u>6 q 2 yrs</u>	6 q 2 yrs
<u>ICU</u>	10 per yr	8 per yr	<u>NA</u>	NA
<u>Stroke Unit</u>	10 per yr	8 per yr	<u>8 q 2 yrs</u>	NA
<u>Stroke Call Roster</u>	10 per yr	8 per yr	<u>8 q 2 yrs</u>	8 q 2 yrs
<u>Core Stroke Team</u>	10 per yr	8 per yr	<u>8 q 2 yrs</u>	8 q 2 yrs
<u>Stroke Medical Director</u>	12 per yr	8 per yr	<u>8 q 2 yrs</u>	8 q 2 yrs
<u>Stroke Program Manager</u>	10 per yr <u>AND</u> conference q 2	8 per yr <u>AND</u> conference 3 yrs	<u>8 q 2 yrs</u>	8 q 2 yrs

TCD Level IV Stroke Center

General Standards for Stroke Center Designation (Note: This information was compiled from earlier drafts of the proposed rules and will require updating; this is informational and is not filed as part of the filed regulations.)

7/15/2011

Time Critical Diagnosis System (Trauma, Stroke, STEMI)

“Time Critical Diagnosis (TCD) System: A coordinated integrated group providing emergency medical care services using regionalization concepts to treat the diagnosis that are truly time critical. At this point, there is clear evidence that severe trauma, acute stroke, and STEMI outcomes can be improved by regionalized care incorporating specialty referral centers that are designated by an accrediting body. These conditions require quick assessment, diagnosis, and treatment. The system focuses on timely recognition, assessment and transport to a facility that can provide definitive care within the comprehensive care network. Within the TCD concept, it is more intuitive to coordinate the three arms of the system under one banner rather than have three separate arms. This allows resource sharing and coordination at many different levels that decreases duplication and costs.” [Missouri Time Critical Diagnosis System Task Force, August 2008](#)

Overview TCD Stroke Center Designation Levels

TCD Level I Stroke Center (Comprehensive)

- 24/7 physician coverage: stroke neurologist, vascular neurosurgeons, neuro-interventionalist
- 24/7 stroke team, specialized care and treatment of all types of stroke (ischemic and hemorrhagic)
- Specific inpatient care requirements - designated stroke beds/ICU beds, CT and lab 24/7
- Conducts research

TCD Level II Stroke Center (Primary)

- Process in place similar to that of Joint Commission certified Primary Stroke Centers
- 24/7 stroke team to administer tPA
- Written care protocols, neurosurgical care within 2 hours, designated stroke beds/ICU, CT and lab 24/7

TCD Level III Stroke Center (Drip and Ship)

- Fast assessment and capacity to initiate treatment and transfer to Level I or Level II
- Working relationship with Level I or Level II

TCD Level IV Stroke Center

- **Process in place for fast assessment, then quick intra-facility transfer to Level I or II**
- **Working relationship Level I or Level II**

TCD Level IV Stroke Center (Note: this information is taken from draft proposed rules and will require updating)

Note:

“IH” after a standard indicates an in-house requirement

“IA” after a standard indicates an immediately (20 minutes) available requirement

“PA” after a standard indicates a promptly (30 minute) available requirement

GENERAL STANDARDS FOR STROKE CENTER DESIGNATION

- Commitment to quality stroke care
- Accept all stroke patients appropriate for the level of care provided at the hospital, regardless of race, sex, creed, or ability to pay
- Evidence of a stroke program available 24 hours a day, 7 days a week to evaluate and treat stroke patients and meet the following requirements:
 - **STROKE TEAM**
 - **Core team** to provide administrative oversight
 - Physician experienced in diagnosis and treating cerebrovascular disease, usually the stroke medical director; and
 - One other health care professional or qualified individual credentialed in stroke patient care as determined by the hospital, usually the stroke program manager/coordinator
 - **Clinical team** appropriate to the center level designation: neurologists, neuro-interventionalist, neurosurgeons, anesthesiologists, intensivists, emergency department physicians, and other stroke center clinical staff
 - **Stroke team** will have appropriate skill and proficiencies as evidenced by documenting:
 - Stroke team members meet position qualifications and CE requirements for the state and hospital
 - Core team and member of stroke call roster participate in at least half of the regular, ongoing stroke program peer review meetings as shown in meeting attendance documents
 - Stroke team members will participate in at least half of the regular, ongoing stroke program PI and patient safety meetings as shown in minutes and meeting attendance documents.
 - Stroke team members will document continued experience in management of sufficient numbers of stroke patients to maintain stroke skills as defined by the hospital, the stroke medical director and state regulations
 - All members of the stroke call roster will document a minimum average of 8 hours of CE in cerebrovascular disease every other year as determined appropriate by the stroke center medical director and as appropriate to the practitioner’s level of responsibility
 - Stroke team will review regional outcome data on quality of patient care as part of the PI and patient safety process
 - Maintain a **MULTIDISCIPLINARY TEAM** in addition to the stroke team
 - Multidisciplinary team will include an appropriate representative from hospital units as appropriate for care of each stroke patient. May include but not limited to: administration, emergency medical services, ICU, radiology, pharmacy, laboratory, stroke unit, stroke rehab, and discharge planning
 - Multidisciplinary team will attend at least half of the stroke program PI and patient safety meetings which will be documented in meeting minutes and attendance lists.
- Hospital will appoint a **STROKE MEDICAL DIRECTOR**.
 - Board certified or board admissible physician
 - Those physicians in the medical director position at the time state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible shall be able to continue in this position

- All new stroke medical directors appointed by the hospital effective 6 months after state regulations take effect shall be board –certified or board-admissible physicians
- Stroke Medical Director will meet the following CME requirements:
 - 8 hours or more CME every other year in the area of cerebrovascular disease
- There will be a job description and organization chart depicting the relationship between the stroke medical director and other services
- Stroke Medical Director is a member of the stroke call roster
- Stroke Medical Director will be responsible for the oversight of the education and training of the medical and clinical staff in stroke care
- **STROKE PROGRAM MANAGER / COORDINATOR** who is a registered nurse or qualified individual
 - There will be a job description and organization chart depicting the relationship between the stroke program manager / coordinator and other services.
 - Stroke program manager / coordinator will have a minimum average of 8 hours of CE every other year in cerebrovascular disease as determined appropriate by the stroke center medical director and as appropriate to the practitioner's level of responsibility
 - Stroke program manager /coordinator will participate in the formal QI program.
- There will be a specific and well-organized system for rapidly notifying and activating the stroke team to evaluate patients presenting with symptoms suggestive of an acute stroke.
- The hospital will have a **ONE-CALL STROKE TEAM ACTIVATION PROTOCOL**. This protocol will establish the following:
 - Criteria used to triage stroke patients according to time of symptom onset
 - Persons authorized to notify stroke team members when a suspected stroke patient is en route or has arrived at the stroke center
 - The method for immediate notification and the response requirements for stroke team members when a suspected stroke patient is en route to the stroke center (IV-R/IA = immediately: 20 minutes availability)
 - All members of the stroke call roster shall comply with the availability and response requirements per the hospital protocol and be in communication within 15 minutes of notification of the patient. If not on hospital premises, stroke call roster members shall carry electronic communication devices at all times to permit contact by the hospital. It is recommended that one member of the stroke team, per hospital protocol, be at the patient's bedside within 15 minutes of notification of the patient.
 - Stroke centers will have a call roster providing 24 hours a day, 7 days a week neurology coverage or regional networking agreement with a Level I stroke center for telephone consult or telemedicine available within 15 minutes of notification of patient when a neurologist is not available on site
 - Stroke centers will have transfer agreements between referring and receiving facilities
 - The hospital will have a one-call transfer protocol that establishes the criteria used to triage stroke patients and identifies the persons authorized to notify the designated stroke center
 - The hospital will have a rapid transfer process in place to transport a stroke patient to a higher level of stroke care when needed.
- The hospital will demonstrate that there is a plan for adequate **POST-DISCHARGE AND POST-TRANSFER** follow-up on stroke patients, including rehabilitation and repatriation, if indicated.
- **STROKE PATIENT LOG** which will contain:
 - Response times
 - Patient diagnosis
 - Treatment / actions
 - Outcomes
 - Number of patients
 - Benchmark indicators
- There will be a lighted designated **HELICOPTER LANDING AREA**
 - Will serve as the receiving and take off area for medical helicopter and will be cordoned off when in use from the general public
 - Recommended that the landing area be no more than 3 minutes from the ED
- Each stroke patient who is admitted transferred, or dies as a result of the stroke, (independent of hospital admission or hospital transfer status) will be entered into a **MISSOURI STROKE REGISTRY**.
 - Includes at least 1 code of the following ICD-9-CM codes: 433.01, 433.10, 433.11, 433.21, 433.31, 433.81, 433.91, 434.00, 434.01, 434.11, 434.91, 436.00, 430.00 and 431.00
 - Registry will be submitted electronically in a format defined by the department, submitted quarterly, within 90 days after the quarter ends. The stroke registry must be current and complete.

- A **HOSPITAL DIVERSION PROTOCOL** will be maintained in accordance with state regulations. Hospital diversion information must be maintained to include date, length of time and reason for diversion.

MEDICAL STAFFING STANDARDS FOR STROKE CENTER DESIGNATION

- Physicians who are credentialed by the hospital for stroke care shall be available as indicated:
 - Physician with experience and expertise in diagnosing and treating patients with cerebrovascular disease available for consultation within 15 minutes of patient notification
 - Physicians who are credentialed by the hospital for stroke care will be available as indicated
 - Emergency department physician (IV-R/IA= 20 minute availability)

STANDARDS FOR HOSPITAL RESOURCES AND CAPABILITIES FOR STROKE CENTER DESIGNATION

- **EMERGENCY DEPARTMENT** standards
 - ED staffing will ensure immediate and appropriate care of the stroke patient
 - Medical director of the ED will be board-certified or board-admissible physician
 - Those physicians in the position at the time the state regulations take effect or hired within 6 months of the effective date of the state regulations who are not board-certified or board-admissible will be able to continue in this position
 - All new medical directors appointed by the hospital effective 6 months after the state regulations take effect will be board-certified or board-admissible physician
 - There will be ED physician competent in stroke care covering the ED 24 hours a day, 7 days a week (IV-R/IA=20 minute availability)
 - The ED physician providing coverage will be current in cerebrovascular CME and each physician:
 - Document a minimum average of 6 hours of CME in cerebrovascular disease every other year
 - There will be a written policy defining the relationship of the ED physicians to other physician members of the stroke team
 - All RN's assigned to the ED will be trained in stroke nursing (including NIHSS), and thrombolytic therapy with NIHSS certification recommended in Level I centers by the hospital within 1 year of assignment.
 - RN's will document a minimum of 6 hours of cerebrovascular disease CE every other year
 - RN's will maintain core competencies in the care of the stroke patient yearly as determined by the hospital
 - The ED will have written care protocols for triage and treatment of acute stroke patients available to ED personnel and should be reviewed annually and revised as needed.
 - ED will have the following equipment for resuscitation and life support available:
 - Airway control and ventilation equipment including laryngoscopes, endotracheal tubes, bag-mask resuscitator, sources of oxygen
 - Suction devices
 - Electrocardiograph (ECG), cardiac monitor and defibrillator
 - All standard IV fluids and administration devices including IV catheters and intraosseous
 - Drugs and supplies necessary for emergency care
 - Two-way communication link with EMS vehicles
 - End-tidal carbon dioxide monitor
 - Temperature control devices for patient and resuscitation fluids
 - There will be documentation that all equipment is checked according to the hospital preventive maintenance schedule
- **CLINICAL LABORATORY SERVICES** will be available 24 hours, 7 days a week with timely availability of results

- Standard analyses of blood, urine and other body fluids
- Coagulation studies
- Blood bank or access to a community central blood bank and adequate hospital blood storage facilities
- Blood gases and pH determinations
- Blood chemistries
- Written policy that the stroke patient receives priority
- There will be documentation of adequate **support services** in assisting the patient's family from the time of entry into the facility to the time of discharge

STANDARDS FOR HOSPITAL PERFORMANCE IMPROVEMENT, PATIENT SAFETY, OUTREACH, PUBLIC EDUCATION AND TRAINING PROGRAMS FOR STROKE CENTER DESIGNATION

- There will be an ongoing **PI AND PATIENT SAFETY PROGRAM** designed to objectively and systematically monitor, review and evaluate the quality, timeliness and appropriateness of patient care, pursue opportunities to improve patient care and resolve identified problems
 - All stroke centers will collect, trend and electronically report to the state key data indicators as identified by the department, including but not limited to
 - A regular morbidity and mortality review at least quarterly
 - Regular reviews of the reports generated by the department from the Missouri stroke registry
 - Regular reviews of pre-hospital stroke care including inter-facility transfers
 - Participation in EMS regional system of stroke care as established by the department
 - Stroke patients not receiving FDA-approved thrombolytic remaining greater than 60 minutes at the referring hospital prior to transfer will be reviewed as part of the PI and patient safety program
 - The receiving hospital will provide and monitor timely feedback to the EMS providers and referring hospital, if involved. This feedback will include, but not be limited to, diagnosis, treatment and disposition. It is recommended that the feedback be provided within 72 hours of admission to the hospital. When EMS does not provide patient care data on patient arrival or in a timely fashion (recommended within 3 hours of patient delivery), this time frame will not apply
 - Review and monitor the core competencies of the physicians, practitioners and nurses
- **PATIENT AND PUBLIC EDUCATION PROGRAM** will be established to promote stroke prevention and signs and symptoms awareness
- **TRAINING PROGRAM** on caring for stroke patients will be established for professionals in the stroke center
 - There will be a hospital approved procedure for training nurses and clinical staff to be credentialed in stroke care
 - Stroke center will have a mechanism to assure that all nurses providing care to stroke patients complete a minimum of required CE to become credentialed in stroke care as stated in the state regulations
 - The content and format of any stroke CE courses developed and offered by a hospital will be developed with the oversight of the stroke medical director. A copy of the course curriculum used will be filed with the department
- The hospital will be actively involved in **LOCAL AND REGIONAL EMS SYSTEMS** by providing training and clinical educational resources.

STANDARDS FOR THE PROGRAMS IN STROKE RESEARCH FOR STROKE CENTER DESIGNATION

- The hospital will agree to cooperate and participate with the DHSS in conducting epidemiological studies and individual case studies for the purpose of developing stroke prevention programs.

TCD Stroke Center Professional Education (CME/CUE) requirements

The TCD Professional Education Stroke Workgroup used draft TCD Stroke Center regulations to compile information contained in the following chart.

<u>Designation Levels</u>	I	II	III	IV
<u>ER Nurses</u>	4 per yr	4 per yr	6 q 2 yrs	<u>6 q 2 yrs</u>
<u>ER Physician</u>	4 per yr	4 per yr	6 q 2 yrs	<u>6 q 2 yrs</u>
<u>ICU</u>	10 per yr	8 per yr	NA	<u>NA</u>
<u>Stroke Unit</u>	10 per yr	8 per yr	8 q 2 yrs	<u>NA</u>
<u>Stroke Call Roster</u>	10 per yr	8 per yr	8 q 2 yrs	<u>8 q 2 yrs</u>
<u>Core Stroke Team</u>	10 per yr	8 per yr	8 q 2 yrs	<u>8 q 2 yrs</u>
<u>Stroke Medical Director</u>	12 per yr	8 per yr	8 q 2 yrs	<u>8 q 2 yrs</u>
<u>Stroke Program Manager</u>	10 per yr <u>AND</u> conference q 2 yrs	8 per yr <u>AND</u> conference 3 yrs	8 q 2 yrs	<u>8 q 2 yrs</u>

Time Critical Diagnosis (TCD) System STEMI Professional Education Work Group Recommendations

Recommendations from the TCD Professional Education STEMI Workgroup 2011

Thank you to the members of the TCD STEMI Professional Education Workgroup who volunteered their time to identify the following recommendations and information. This workgroup's intent was to provide useful information for all designated TCD STEMI Centers.

The TCD STEMI Professional Education Workgroup has been established to review courses relevant to stroke credentialing, create a summary of available course sites and provide resource.

Goals:

1. Identify core competencies that reflect appropriate patient care modalities for STEMI patients.
2. Recognize national and state courses for relevant content related to STEMI patient care competencies.
3. Cite a catalog of resources to assist facilities in locating accepted competency courses.
4. Establish overall venues related to TCD efforts that may be utilized for public education with regards to patient transport and the TCD effort in Missouri.

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Section I Definitions (19 CSR 30-40.740)

1. **Clinical team:** a team of healthcare professionals involved in the care of the STEMI patient and may include but not be limited to cardiologists, interventional cardiologists, cardiovascular surgeons, anesthesiologists, emergency medicine, and other STEMI center clinical staff. The clinical team is part of the hospital's STEMI team.
2. **Continuing education:** education approved or recognized by a national and/or state professional organization and/or STEMI medical director.
3. **Continuing medical education (CME):** the highest level of continuing education for physicians that is approved by a national and/or state professional organization and/or STEMI medical director.
4. **Core team:** a subunit of the hospital STEMI team which consists of a physician experienced in diagnosing and treating STEMI (usually the STEMI medical director) and at least one other healthcare professional or qualified individual competent in STEMI care as determined by the hospital (usually the STEMI program manager/coordinator).
5. **Credentialed or credentialing:** a hospital specific system of documenting and recognizing the qualifications of medical staff and nurses and authorizing the performance of a certain procedures and establishing clinical privileges in the hospital setting.
6. **STEMI Call Roster:** a schedule that provides twenty-four (24) hours a day, seven (7) days a week cardiology service coverage. The call roster identifies the physicians or qualified individuals on the schedule that are available to manage and coordinate emergent, urgent and routine assessment, diagnosis and treatment of the STEMI patients.
7. **STEMI Team:** is a component of the hospital STEMI program and consists of the core team and the clinical team.

Definitions developed by the STEMI Professional Education Task Force *(These are recommendations and are not part of the filed regulations.)*

1. **Core competency:** Fundamental knowledge, skill, and ability in a specific area. Expectation anyone involved in STEMI care demonstrate awareness.
2. **Progressive/Intermediate Cardiac Unit:** the nursing unit where the patient receives care after the intensive care unit, usually referring to the step-down unit.

Section I (Continued) Other Information

From proposed TCD regulations for STEMI Center Designation (19 CSR 30-40.750):

A professional education outreach program shall be established in the region and outlying areas to provide training and other supports to improve care of STEMI patients (I-R, II-R, III-R)

A training program on caring for STEMI patients shall be established for professionals in the STEMI center (I-R, II-R, III-R, IV-R)

1. There shall be a hospital-approved procedure for training nurses and clinical staff to be credentialed in STEMI care.
2. The STEMI center shall have a mechanism to assure that all nurses providing care to STEMI patients shall complete a minimum of required continuing education to become credentialed in STEMI care as stated in these regulations; and
3. The content and format of any STEMI continuing education courses developed and offered by a hospital shall be developed with the oversight of the STEMI medical director. A copy of the course curriculum used shall be filed with the department.

The hospital shall be actively involved in local and regional EMS systems by providing training and clinical education resources (I-R, II-R, III-R, IV-R)

Section II - Qualified Medical Professionals (QMP) Education Requirements

From draft STEMI Center Regulation on TCD website

TCD STEMI Center Professional Education (CME/CUE) Requirements				
The TCD Professional Education STEMI Workgroup used draft TCD STEMI Center regulations to compile information contained in the following chart.				
Designation Levels	I <i>Required # of hours</i>	II <i>Required # of hours</i>	III <i>Required # of hours</i>	IV <i>Required # of hours</i>
Core STEMI Team Members of the STEMI call roster	10 per yr	10 per yr	8 every 2 yrs	8 every 2 yrs
STEMI Medical Director Level I and II	10 per yr	10 per yr	N/A	N/A
STEMI Medical Director (Board Certified/Eligible) Level III and IV	N/A	N/A	8 every 2 yrs	8 every 2 yrs
STEMI Medical Director (Not Board Certified/Eligible) Level III and IV	N/A	N/A	10 every 2 yrs	10 every 2 yrs
STEMI Program Manager	10 per yr	8 per yr	8 every 2 yrs	8 every 2 yrs
ED Physicians	4 per yr	4 per yr	6 every 2 yrs	6 every 2 yrs
ED Nurses	4 per yr	4 per yr	6 every 2 yrs	6 every 2 yrs
ICU Nurses	8 per yr	8 per yr	N/A	N/A
Cardiac Cath Lab Staff	8 per yr	8 per yr	N/A	N/A
Progressive/Intermediate Cardiac Care Unit	8 per yr	8 per yr	8 every 2 yrs	N/A

The education requirements are from draft regulations on the TCD website 1/19/2011
(19 CSR 30-40.750)

Section III - Core Competencies for TCD Professional Education: STEMI (Hospital setting)

The following are suggestions from the TCD STEMI Professional Education Workgroup for Core Competencies. Your selections should be based on the individual needs of your facility, TCD QA measures, and the goal of improving patient outcomes.

******The education should be tailored to the individual needs of your facility******

Knowledge of the processes specific to your facility, and knowledge of the state or community plan.

Awareness of “pre-hospital” and “intra-hospital” and “post-hospital” care in relation to your facility in the STEMI process of the Time Critical Diagnosis 360°/365° Emergency Medical Care System Continuum

The Core Competencies may include, but are not limited to:

1. 12 lead EKG interpretation by key personnel based on level of care
2. Knowledge of Systems of Care Approach for STEMI management as defined by AHA/ACC
http://www.heart.org/HEARTORG/HealthcareResearch/MissionLifeline/HomePage/Mission-Lifeline-Recommendations-for-Criteria-for-STEMI-Systems-of-Care_UCM_314027_Article.jsp
 - a. Knowledge of the processes specific to your facility
 - b. Awareness of “pre-hospital” and “post-hospital” care in relation to your facility in the STEMI process of the Time Critical Diagnosis 360°/365° Emergency Medical Care System Continuum
<http://health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php>
 - c. Multidisciplinary conference to discuss STEMI and promote awareness of TCD/ AHA Mission Lifeline process at your facility
 - d. Ongoing review of facility specific data and comparison to national benchmarks to drive quality improvement (QI)
3. Atypical presentations with STEMI
4. ACC/ AHA practice guidelines for management of STEMI patients
5. Post cardiac arrest care including therapeutic hypothermia
6. Cardiogenic shock management including intra-aortic balloon pump and Impella® Left Ventricular Assist Device

Primary PCI center focus:

1. Time to reperfusion 1st encounter to device
2. Pathophysiology, early versus late presentation--thrombus age with risk of complications
3. Treatment and diagnosis of Acute Coronary Syndromes
 - a. STEMI
 - b. Fibrinolytics
4. Medical management recommendations for STEMI care
 - a. Oxygen
 - b. Nitroglycerin
 - c. Analgesia
 - d. Antithrombotics
 - e. Antiplatelets
 - f. Beta Blockers

Non-PCI center focus: time to reperfusion

1. Triage and transfer OR
 - a. Fibrinolytics
2. Pathophysiology, early versus late presentation---thrombus age with risk of complications
 - a. treatment and diagnosis of Acute Coronary Syndromes:
 - b. STEMI
 - c. Fibrinolytics
3. Medical management recommendations for STEMI care
 - a. Oxygen
 - b. Nitroglycerin
 - c. Analgesia
 - d. Antithrombotics
 - e. Antiplatelets
 - f. Beta Blockers

Section IV – STEMI Benchmarks /core measure indicators

The following are suggestions from the TCD STEMI Professional Education Workgroup for critical time intervals; the intent of this section is for professionals caring for these patients to have an understanding and awareness.

Critical time intervals

1. Symptom onset to 911 call
2. 911 call to EMS “on scene” time
3. Door to transfer to transfer (within 30 minutes)
4. PTA EMS transmit EKG
5. PTA EMS/ ED MD cath lab activation
6. Door to EKG (within 10 minutes)
7. Door to ED physician (within 10 minutes)
8. Door to STEMI activation (within 10 minutes)
9. Door to Device (within 90 minutes)
10. Door to Fibrinolytic therapy (within 30 minutes)

Pre-hospital critical activities prior to transfer

1. Awareness of importance of calling EMS both for patients and transfer facilities
2. 12 lead ECG
3. Administer aspirin, oxygen
4. Draw labs—chemistry, complete blood count and coagulation studies
5. Awareness of Community Plan and/or Regional Plans
6. Awareness of State Destination Protocol

Critical Pharmacologic Agents

Arrival

1. ASA at arrival
2. Anti-thrombin possible options at arrival—use only one
 - Heparin
 - Enoxaparin
 - Bivalirudin
 - Fondaparinux
3. Thienopyradine possible options at arrival—use only one
 - Clopidogrel (Plavix)
 - Prasugrel (Effient)
 - Ticlopidine (Ticlid)

During Hospitalization

1. Anticoagulant dosing protocol
2. Educating the facility staff on potential adverse outcomes from anticoagulant therapies

Discharge

1. Educate patients to be aware of ACS symptoms and recognition
2. ASA prescribed at discharge
3. Beta-blocker prescribed at discharge
4. Statin prescribed at discharge
5. ACE1 or ARB for LVSD at discharge
6. Clopidogrel /thienopyridine at discharge
7. Lipid-lowering therapy at discharge

Newer Therapies

Maintain knowledge of current literature and therapies available for patients.

Critical Ancillary Activity

1. Smoking cessation advice/counseling
2. Cardiac rehabilitation patient referral from inpatient setting
3. LDL-Cholesterol test in hospital record or documented in the chart when planned
4. Education on 911 or EMS access in their area

Section V - Education Resources (**not an inclusive list*)

Topic	Type of Program	Sponsoring Organization / Company	Target Audience	CE Credit	Cost	Comments
STEMI Project Upstart	On-line, self-directed	American Heart Association	Physicians Nurses Nurse Practitioners	Varies	Varies	http://www.heart.org
Mechanisms of STEMI	On-line, self-directed	Graduate Education Foundation	Nurses Nurse Practitioners	1.5	\$150.00 Annual Subscription	www.cmelectures.org
All topics related to cardiovascular care	On-line, self-directed	UpToDate Inc.	Physicians	Earn credit each time a clinical question is researched	No cost	http://www.uptodate.com
Acute ST Elevation MI Care	On-line, self-directed	American Heart Association	Physicians Nurses	Varies	No cost	http://www.heart.org www.scientificsessions.org
12-Lead EKG Interpretation	On-line, self-directed	American Heart Association	Physicians Nurses Nurse Practitioners	Varies	Varies	http://www.heart.org
	On-line, self-directed	American College of Cardiology Foundation	Physicians Nurses Nurse Practitioners			http://www.acc.org
Practice Guidelines for Management of STEMI patients --PCI /Non PCI centers	On-line, self-directed	American College of Cardiology Foundation	Physicians Nurses Nurse Practitioners			http://www.cardiosource.org
Percutaneous Coronary Intervention Updates	On-line, self-directed	Society for Cardiovascular Angiography & Interventions	Physicians Nurses Nurse Practitioners			www.scai.org
Time Critical Diagnosis System	On-line, self-directed	Missouri Department of Health and Senior Services	Physicians Nurses Nurse Practitioners		No cost	www.dhss.mo.gov

Section V - Education Resources-Continued

National organizations

- ACC American College of Cardiology www.acc.org
- Cardiosource American College of Cardiology www.cardiosource.org
- American Heart Association www.americanheart.org
- American Heart Assoc Scientific Sessions www.scientificsessions.org
- SCAI Society for Cardiac Angiography & Interventions www.scai.org
- Society of Chest Pain Centers www.scpc.org
- Medscape www.medscape.com/cardiology
- Alliance of Cardiovascular Professionals ACVP www.acp-online.org
- ENA Emergency Nurses Association www.ena.org
- ACEP American College of Emergency Physicians www.acep.org
- AACN American Association of Critical Care Nurses www.aacn.org

Section V Continued– Additional Resources

Washington University

Online and self directed education

Target Audience: physician, midlevels and nurses

Cost: Free

CME: Varies

Web Address: DHSS TCD Web site, pending

Course Description: (Acute Coronary Syndromes Class)

Approximately 3.5 hour course reviewing:

- Pathophysiology of ACS
- Methods of detecting ACS; including 12 lead, troponins etc
- Treatment regimens; pharmacological treatments, interventions
- Post Intervention Complications and a Case Study

Missouri State Resources:

Mo Department of Health and Senior Services (DHSS) www.health.mo.gov

DHSS Time Critical Diagnosis System

www.health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php

DHSS Bureau of Emergency Medical Services

www.health.mo.gov/safety/ems/index.php

DHSS Division of Community and Public Health links

<http://health.mo.gov/living/index.php>

<http://health.mo.gov/living/healthcondiseases/chronic/index.php>

<http://health.mo.gov/living/lpha/index.php>

Section 6:

Public Education

Time Critical Diagnosis (TCD) System -- Public Education Work Group Charter (4/9/2010)

Mission: *To develop a coordinated public education campaign for use by statewide, regional and community agencies and groups to promote the TCD system and increase awareness regarding the importance of calling 911 without delay when trauma or symptoms of stroke or STEMI occur.*

Current situation

- Hospitals have independent public education approaches.
- Missouri generally not system-oriented.
- There are a plethora of related messages competing for the public's attention.
- Missourians demonstrate good knowledge of common symptoms and intent to call 911. However, knowledge of symptoms does not translate to recognition of heart attack or stroke and actually calling 911.
- Very limited public understanding of the TCD system.

Benefits of coordinated campaign

- Unites community approaches to create an integrated statewide campaign that will have broader reach and impact to
 - Increase use of 911 without delays and
 - Increase recognition of symptoms.
- Leverages community efforts and saves time and effort since research and investment for statewide campaign available for all.
- Helps designated centers meet outreach and public education requirements.

Work Group Member Expectations

- Actively participate in scheduled meetings via webinars.
- Read preparation documents for discussion.
- Gather input from colleagues and represent agency's position. Share information and progress with colleagues to keep them apprised of efforts.
- Follow guiding principles for meeting discussions.
- Contribute to outcomes and end products.

Core tasks:

- Identify TCD messages to prompt desired actions and behaviors.
- Develop messaging strategies to reach priority public audiences.
- Develop materials and tool kit to help partners conduct effective campaigns.
- Plan coordinated launch of campaigns.
- Provide technical assistance for those conducting campaigns.

- Evaluate and retool as needed.

Differences between tasks for public and professional education work groups

Public education

1. Develop and make available core TCD messages for use with public.
2. Develop resources and materials for agencies and groups to conduct coordinated statewide TCD system, symptoms and 911 campaigns.

Professional education

1. Adapt TCD system messages for use with professional audiences.
2. Develop and implement professional education plans.

Scope of the project

- Little or no additional funding available—participants' time and contributions and existing DHSS public information staff will inform and support campaign development.
- Will span all three arms of TCD system—trauma, stroke and STEMI.
- Approximately one year project for development and launch of statewide campaign at which time public education efforts will be evaluated to determine best approach for long-term support of public education for each specific TCD arm.

Unintended consequences that want to avoid:

- Lack of buy-in to coordinated campaign.
- Insufficient statewide participation, no improvements in effectiveness.
- Further confusion or dilution of efforts if yet another set of messages.

Desired outcomes and end products

1. Coordinated and sustained campaign that improves awareness and behaviors of priority populations regarding
 - a. TCD system and its benefits,
 - b. Trauma and stroke and STEMI symptom recognition, and
 - c. Decreased delay in calling 911.
2. Public Education resources for coordinated campaign
 - a. Readily accessible materials (posters, press releases, etc),
 - b. Tool kit to conduct effective campaign, and
 - c. Coordinated launches.

Talking points - Missouri's Time Critical Diagnosis System

Missouri's Time Critical Diagnosis System

- Missouri's Time Critical Diagnosis System is new statewide system that brings together the 911 emergency phone system, ambulance services and hospitals in a coordinated way to provide quicker and higher-quality treatment.
- The system will help increase the survival and recovery rate of people suffering a traumatic injury, stroke or heart attack.
- The new system builds on Missouri's existing trauma system, which identifies specific hospitals as trauma centers specially equipped for the treatment of serious injuries. The Time Critical Diagnosis System includes hospitals that are designated as specially equipped to treat stroke and heart attack, particularly STEMI, a specific type of heart attack.
- Missouri is the first state in the nation to enact legislation authorizing the creation of a statewide system of care for stroke and STEMI patients that is modeled after the trauma center system.
- Hospitals participating in the system must meet certain requirements to be designated as a trauma, stroke and/or STEMI center. Those requirements include having specialized medical teams and services available 24 hours a day, seven days a week. Each designation is granted separately, based on a hospital's ability to meet the requirements for each type of emergency treatment.
- 9-1-1 coordination is vital as it is the beginning point of activation for the TCD system.
- Emergency response services (ambulance services) must also meet certain requirements to be included in the system. Those requirements include the ability to communicate with a hospital about a patient's treatment and alert a hospital that a patient is on the way so medical staff can be ready to continue treatment as soon as the patient arrives.
- The primary goal of the Time Critical Diagnosis System is to provide the right care at the right place at the right time for trauma, stroke and heart attack patients.
- Because calling 911 is key to the emergency response system, health officials have developed a new public education campaign, "Minutes Matter. Call 911."

Minutes Matter. Call 911.

- "Minutes Matter. Call 911." urges Missourians to call 911 for emergency medical help for trauma, stroke and heart attack.

- Too often Missourians do not call 911 and instead drive themselves or family members or friends to the hospital or they wait too long to call for emergency help, which reduces the patient's chance for survival or a full recovery.
- The campaign also promotes Missouri's new Time Critical Diagnosis System.
- The primary messages of the campaign are:
 - By calling 911, you can access emergency medical care that can save your life and prevent permanent disability.
 - Emergency medical staff can begin treatment as soon as they reach the patient.
 - Medical care continues while the patient is being transported to the hospital.
 - Hospital staff is alerted that a patient is on the way so health care professionals can be ready to begin treatment as soon as the patient arrives.
 - Patients are taken to a hospital with staff that has been specially trained to handle trauma, stroke and STEMI (a common form of heart attack).
 - Time is a crucial element for trauma, stroke and heart attack patients. The quicker treatment can begin, the more successful the outcome.
 - Stroke victims who receive treatment within 180 minutes and STEMI victims who receive treatment within 30-90 minutes from the time symptoms begin are more likely to survive, recover more quickly and are less likely to have permanent disabilities.
 - Currently, only a small percentage of stroke victims and less than 40 percent of STEMI victims reach the hospital and receive treatment in the ideal time frame.
- The campaign also will provide information about the symptoms of stroke and heart attack. Recognizing the symptoms more quickly should help reduce the amount of time from when symptoms start and treatment begins.

Background

- More than 400 partners from health care and emergency response organizations from across Missouri have been working for the past several years to create the Time Critical Diagnosis System. A task force met regularly to develop recommendations for the system.
- The effort is being led by the Missouri Department of Health and Senior Services and the Missouri Foundation for Health.
- The Missouri Department of Health and Senior Services developed the regulations and will provide administrative oversight for the system.

Minutes matter. Call 911.

Trauma



Stroke



Heart Attack

"The most important thing is to call 911 if you or someone else is seriously injured or has symptoms of stroke or heart attack."

When a medical emergency strikes, quick action is vital for survival and recovery.

A new emergency medical care system has been created in Missouri to provide a quicker response and high quality care for trauma, heart attack and stroke.

The Time Critical Diagnosis (TCD) System was developed by the Missouri Department of Health and Senior Services, the Missouri Foundation for Health and partners throughout the state to improve emergency medical care across the state. This new system will save lives and help more Missourians fully recover from a medical emergency.

What is the TCD System?

Through the TCD System, specialized health care professionals are ready at a moment's notice to provide rapid response and coordinated care for stroke, heart attack and trauma including automobile crashes, falls and other serious injuries.

The TCD System includes the 911 emergency phone system, ambulance services and hospitals designated to treat trauma, stroke and heart attack patients.

The TCD System provides the right care, at the right place, at the right time.

How does the TCD System work?

When a call is made to 911, emergency medical responders head to the scene of the emergency and begin treatment as soon as they arrive. They alert the hospital that they are on their way with a patient and continue to communicate with specialized hospital staff about the patient's treatment.

A medical team is ready to continue the care as soon as the patient gets to the hospital.



How do I know when to call 911?

It's not always easy to know when to call 911. But dismissing an injury as "not too bad" can have serious consequences.

It also can be difficult to know that someone is having a heart attack or stroke. Learning the signs of heart attack and stroke can help you know when to call 911 for help.

Calling 911 allows emergency medical professionals to help determine if a trip to the hospital is necessary.

Whether a person has been injured or is having a heart attack or stroke, the sooner treatment begins, the more successful it will be.



Missouri's New
Time Critical Diagnosis System
for emergency medical care

Minutes matter. Call 911.



Trauma ● Stroke ● Heart Attack

With Missouri's new Time Critical Diagnosis System, emergency care starts the minute you dial 911.



Missouri's New
Time Critical Diagnosis System
for emergency medical care

Call 911 for a quick response and quality care.

When a medical emergency happens, a quick response is key to treatment, recovery and survival.

Missouri has developed a new statewide system to help ensure a quick response and high quality care when trauma, stroke or heart attack occurs.

The Time Critical Diagnosis System, or TCD system, for emergency medical care brings together the 911 emergency phone system, ambulance services and hospitals to provide the best possible care. The TCD System will benefit all Missourians — urban and rural.

Knowing when to call for help is vital. Recognizing serious trauma and learning the symptoms of stroke and heart attack will let you know when to call for emergency medical assistance. Waiting too long can cause long-lasting problems.

When you call 911, the TCD System is activated immediately. Dispatchers will send the right EMS technician to begin assessment and treatment immediately. You will be transported to a medical facility for the type of care you need. A specialized team of health care providers will be alerted so they can be ready for your arrival.

Through the TCD System, health care providers are able to provide patients with the right care, at the right hospital, and in the right amount of time.

Minutes matter. Call 911.

When a medical emergency happens, a quick response is key to treatment, recovery and survival.

Missouri has developed a new statewide system to help ensure a quick response and high quality care when trauma, stroke or heart attack occurs.

The Time Critical Diagnosis System, or TCD System, for emergency medical care brings together 911, emergency medical services and hospitals to provide the best possible care for Missouri residents.

Knowing when to call is vital. Recognizing serious trauma and learning the symptoms of heart attack and stroke will help you know when to call for help. Waiting too long can cause long-lasting problems.

When you call 911, the TCD System is activated immediately. Dispatchers will send the right EMS technicians to begin assessment and treatment immediately. You will be transported to the right medical facility for the type of care you need. A specialized team of health care providers are alerted so they are ready for you.



Through the TCD System, health care providers are able to provide patients with the right care, at the right hospital, and in the right amount of time.

Missouri's New
Time Critical Diagnosis System
for emergency medical care



Minutes matter. Call 911.

When a medical emergency happens, a quick response is key to treatment, recovery and survival.

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The Time Critical Diagnosis System, or TCD System, for emergency medical care brings together 911, emergency medical services and hospitals to provide the best possible care for Missouri residents.

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When you call 911, the TCD System is activated immediately. Dispatchers will send the right EMS technicians to begin assessment and treatment immediately. You will be transported to the right medical facility for the type of care you need. A specialized team of health care providers are alerted so they are ready for you.



Through the TCD System, health care providers are able to provide patients with the right care, at the right hospital, and in the right amount of time.

Missouri's New
Time Critical Diagnosis System
for emergency medical care



Minutes matter. Call 911.

Accidents, falls, loss of consciousness...

Many times it is obvious when an injury demands a 911 call. But in some cases it is difficult to know when an injury is severe enough. However, dismissing an injury as "not too bad" can have terrible consequences.

When you don't know, call 911. Let professionals help determine if an ambulance is needed.

Treatment begins as soon as emergency medical responders arrive. The hospital is alerted so a specialized medical team is ready to continue care as soon as the individual arrives. Minutes matter. Call 911.



Missouri's New
Time Critical Diagnosis System
for emergency medical care

Section 7:

Rural-Urban Coordination Workgroup

Time Critical Diagnosis Rural-Urban Coordination Workgroup (7-01-2011)

Mission: To identify resources and opportunities for coordination between Rural and Urban out-of-hospital and hospital emergency medical care providers so they can provide exceptional care for TCD patients.

Current situation

- Rural and urban components are equally important in the emergency medical care system
- Rural and urban components share common patient goals
- Rural and urban components work with a common system
- Rural and urban settings have different resources
- Rural and urban settings have different demands
- Rural and urban settings are often interdependent in patient care.

Benefits of coordinating Rural and Urban processes, resources and goals

- Work together to educate about the importance of right care, right place, right time
- Opportunity to share experience, guidance, and resources
- Opportunity to develop understanding of rural and urban processes, requirements, demands and constraints
- Opportunity to coordinate processes to achieve common goals
- Work to have more consistent and uniform data collection statewide
- Produce workable data to use for future funding purposes and to create better patient outcomes and healthcare delivery
- Unifies and helps integrate approaches across disciplines and helps to develop statewide best practices
- Increases networking opportunities.

Work Group Member Expectations

- Actively participate in scheduled meetings/webinars
- Read preparation documents for discussion at meetings
- Gather input from colleagues and represent agency's position. Share information and progress with colleagues to keep them apprised of efforts
- Follow guiding principles for meeting discussions
- Contribute to end products and outcomes.

Unintended consequences to be avoided

- Avoid 'siloed' approaches among TCD system agencies and disciplines
- Resistance to coordinated effort
- Turf protection compromises effectiveness of efforts
- Duplication of information already available.

Core tasks

1. Group will explore similarities and differences between operations in rural and urban settings, pre-hospital and hospital, and how this impacts patient management
2. Group will develop guidance for transport options in common scenarios in rural areas for time critical conditions

3. Group will develop guidance for transport options in common scenarios between rural and urban areas for time critical conditions
4. Group will develop guidance for rural and urban inter-hospital relationships and processes
5. The group will develop guidance around time windows and activities that occur within and outside of those time windows in common scenarios.

Scope of the project

- Little or no additional funding available—participants' time and contributions and existing DHSS staff will support efforts
- Will span all three arms of TCD system—trauma, stroke and STEMI
- Recommendations produced by group should strive to reflect process at each system component, or each point of the TCD circle, in rural and urban settings and their intersection
- Approximately eight-month project for developing dialogue and completing core tasks and end products. At that time, will evaluate if there is a need for the group to continue
- End products to be available by winter 2012.

Desired outcomes and end products

1. An understanding of system operations, requirements, demands, and constraints in rural and urban areas between rural and urban partners
2. An understanding of the equal importance of rural and urban partners in the emergency medical care TCD system and system's approach to time critical patients
3. An understanding of how the different components of the TCD circle/system coordinate, collaborate, and integrate with one another
4. Identification of resource gaps and needs for time critical patient processes
5. Guidance for rural-urban partnerships for time critical patients
6. Guidance for processes in rural, urban, and rural-urban interaction for time critical patients
7. Identification of potentially shared resources, for example, educational resources
8. Recommendations for quality assurance functions that should be done on local and/or regional level on a regular basis with time frame defined (e.g., quarterly, annually)
9. Recommendations for specific training and supports needed for hospital and out-of-hospital agencies and personnel.

TCD Task Force Summary and Recommendations for Rural-Urban Coordination

The TCD Task Force produced several recommendations on how to achieve coordination between pre-hospital and hospital elements across geographic regions in the state. The group identified examples of existing processes around Missouri that could be modeled and recommendations by which to improve rural-urban coordination.

I. Examples of Current Processes around the state include:

Local Protocols/standardized flow sheets and work sheets for more standardized transfer process;

Local education and outreach between hospitals and EMS; EMS liaisons developing relationships;

Protocols for rural settings/hospitals developed between receiving and referral hospitals;

Coordination of hospitals with ground and air transport;

Telemedicine;

Face to face visits between hospitals to discuss programs and questions; hospital to hospital education and outreach;

Variable 9-1-1 capability and integration into system;

Regional/local education for rural hospitals, ground EMS and air EMS by larger centers.

II. Recommendations include:

Pre-Hospital:

Development of transfer sheet that goes with EMS from hospital to hospital as part of a toolkit;

Resource documents for EMS;

Timely access to air ambulance/coordinate ground to air; create streamlined process for contacting air resources;

Early activation of air services- early activation process; helicopter utilization information; education of providers regarding early activation;

Transport protocol/community wide plan/ pre-determined plan for destination determination; Question for further discussion- who can delineate medical stability- eg paramedic in field, on-line medical direction/control?

MOU's with adjacent ambulance districts.

Referral Hospital

Resource documents for Referral hospitals; eg incorporate Stroke-STEMI resources, injury specific resources, disease specific information, process related, walk-ins, EMS;

Information for what to do with patient you can't move;

Information on patient transport with limited resources;

ATLS as information/recommendations for rural hospital transfer for trauma;

Coordination of care with receiving hospital- for example, avoiding imaging/procedures that delay transfer and won't change what need to do; ensuring all obtained imaging and tests are copied and sent;

Survey of Level IV centers- what information do they need; share information of when to call for transfer and what information they need to share; More input needed from the critical access hospitals.

Transfer Process

Central receiving address for electronic information from EMS in field;

Provide list of regional resources: hospitals/levels/type of center; ground-air resources;

Feedback to referral and receiving centers on what slows process;

Liaison follow up with EMS/hospital after each case; education, needs, problems/issues, feedback;

Develop community strategies and processes; create a framework for resources to be adapted on a local and regional level;

Develop plans prior to emergent situations occurring (weather, isolated geography);

Local-Regional recommendations on patient transport; recommendations for isolated communities- modes of transport, what to do with patients you can't move to higher level of care;

Resources: Use of compatible equipment- IV tubing/equipment; standardize as much as possible- eg tubing/primers- across EMS and hospitals, at least on local/regional level;

Develop one call process to higher level/receiving center for patient transfer and acceptance;

Clear labeling of drugs/drips/concentration/rate.

Education

Outreach- hospital to hospital, hospital to EMS; Regional and local;

Shared education- hosp/hosp; hosp/EMS;

Develop mentoring relationships locally/regionally;

Community education;

Education regarding EMS process/EMTALA/Patient choice.

Performance Improvement

Develop metrics for times, system processes.

III. Completed Recommendations include (to further evolve as needed locally/regionally)

Standardized information recommendations include: name, age/DOB, SSN, height, weight, gender, identified injuries/condition, treatments done, pertinent imaging and labs; family/contact information and location; contact at referral hospital; mode of transport; things they may want call back on; changes in plan/vitals/conditions/transport; large bore IV, AC stroke-STEMI/ATLS protocol for trauma; compress vessels if needle sticks and lytics; if time, go through contraindications to cath or lytics; how far out; anything that can be done beforehand; stroke time last known well/guideline document information;

Tool Kit recommendations include: Resource documents, Physician preferences, Referral- Receiving hospitals instructions- including call prior to referral, get only what information needed to identify life threatening injuries/conditions and only do what needs to be done at that time and stage in process in order to expedite transfer to definitive care; Education for Referral/Pre-hospital use/Development and inclusion of referral hospital education document; Include local/regional process; Information for patients that can't move; Receiving hospital expectations; local/regional nuances; Checklist- create on regional level; include examples and people can adapt; Resource documents; Recommendations regarding equipment;

Have the toolkit readily available on the TCD website for providers to access.

Hand-Off Process recommendations include: Consistency from/for CAH- in communication, local process for air/ground; resources on process from regional and state meetings; assistance in implementation on local level; mentoring between 1 and 2 and 3's as needed and 4's;

Physician communication on clinical care- work with EMS, initial reperfusion strategy at referral

hospital; need follow up call after transfer arranged- 1st call- quick “one call activation”, 2nd call update as patient en route; include information on each step/what info to communicate with each;

Community strategy; agreements/shared processes between referral and receiving centers on reperfusion strategy; shared models and templates; standardization in a community/EMS where possible.

Stroke/STEMI specific:

Framework/template for referral process and lytic or no lytic: develop/use standardized forms/protocols, one call process and send doc's- fax from referral to receiving center; add to tool kit; rural hospitals spend time waiting for acceptance from receiving center- develop process to avoid wait time: can state level work group develop template/framework for transfer process and recommended information and region's fill in details?

Question for further discussion-Should the referral hospital call before giving lytics- attending physician calls directly to catheterization lab physician ; process will differ by location- if sure and have wait for PCI beyond 90-120 minutes give lytics; if not sure, have process to call receiving center.

Plans of care for patients that can't be moved- recommendations include: Emergency Department physician to Emergency Department physician conversation; if can't transport by air then go by ground if conditions permit; if can't move, develop Physician consultation and management process with expectation that patient will move to receiving center when conditions permit; regional and local process development.

Recommendations for addressing what slows process/how expedite include:

Streamline processes- eg. change IV tubing to fit pump at receiving hospital – equipment consistency; recommend regions look at equipment in regions and how can save time;

Need “one call” process for air transport;

Incorporate EMS response in timely manner for hospital to hospital transfer, education of professionals regarding timeframes, timely recognition of need for transfer by referral hospitals;

Set cocktail of drugs/list of interventions- eg do hospitals want heparin and what form; standardize as possible, be evidenced-based;

Stroke-Lytics: with telemedicine/Level III stroke, develop process to give lytics before

transferring if within time window- pre-established plan with referral hospital for plan of action/lytics; mentoring and education between receiving and referral hospitals; develop process for prior notification of receiving hospital for patients categories- other transfers after physician to physician conversation; shared forms/formats- develop template/framework for lytics;

Stroke Care Plans: incorporate Brain Attack Coalition or American Stroke Association guidelines and Physician to physician conversations between referral and receiving centers; recommend have system/process in place; create framework for transfer process and regions; create similar framework for what slows/speeds process as with STEMI and trauma.

Recommendations for Patient Transport with Limited Resources include:

MOU's with adjacent services/ambulance districts;

Recommendations for transport include:

- Local and regional rendezvous plans- eg. ground-hosp-ground-air

- Early Activation Process/Helicopter Utilization Information

- Regional plan for what to do in difficult circumstance and by map

- Development of mentoring relationships

- Develop streamlined process for getting air ambulance/coordination with hospital
and ground EMS

- Develop FACT/FAQ sheet for EMTALA

- Develop list of where patients can be transported within referring/receiving hospital

- Gather more input from CAH's on local/regional processes

- Develop joint effort of hospitals to mentor referring hospital and EMS; develop
information and resources/policy/recommendations as appropriate

- Develop and share common threads of information

- Recognize similar considerations from hospital or field

- Develop pre-determined transport options available by locale/region for different
conditions, circumstance, scenarios

Section 8:

9-1-1 Coordination Workgroup

Time Critical Diagnosis 911 Coordination Workgroup (7-20-2011)

Mission: To define those that dispatch for EMS as part of 9-1-1/PSAP functions in relation to TCD. To identify resources and opportunities for coordination between 911, EMS and hospital emergency medical care providers, recognizing, modifying, and building on what already exists, so they can provide exceptional care for TCD patients.

Current situation

- 911/PSAP's play a critical role in the emergency medical care system
- 911/PSAP, EMS and hospital providers share common patient goals
- 911/PSAP, EMS and hospital TCD System components work within a common system
- 911/PSAP settings have different resources
- 911/PSAP settings have different demands
- 911/PSAP, EMS and hospital TCD System components are interdependent in patient care
- Patient outcomes depend on effective and efficient coordination of 911/PSAP, EMS and hospital TCD System components
- Missouri has 17 counties with no 9-1-1/PSAP coverage
- Not everyone uses EMD or PAI; some PSAP's do not dispatch for EMS

Benefits of coordinating 911/PSAP processes, resources and goals

- Work together to educate about the importance of right care, right place, right time
- Opportunity to share experience, guidance, and resources
- Opportunity to develop understanding of 911/PSAP processes, requirements, demands and constraints
- Opportunity to coordinate processes between 9-1-1/PSAPs, EMS and hospitals to achieve common goals
- Opportunity to have more consistent and uniform data collection statewide that begins with patient entry into the system
- Opportunity to produce workable data to use for future funding purposes
- Opportunity to unify and integrate approaches across disciplines to optimize patient outcomes
- Opportunity to increase networking opportunities
- Opportunity to recognize unique features and different solutions to similar issues

Work Group Member Expectations

- Actively participate in scheduled meetings/webinars
- Read preparation documents for discussion at meetings
- Gather input from colleagues and represent agency's position. Share information and progress with colleagues to keep them apprised of efforts
- Follow guiding principles for meeting discussions
- Contribute to end products and outcomes.

Unintended consequences to be avoided

- Avoid 'siloed' approaches among TCD system agencies and disciplines
- Resistance to coordinated effort
- Turf protection compromises effectiveness of efforts
- Duplication of information already available.

Core tasks

1. Group will review current status of coordination between 9-1-1/PSAP, EMS and hospitals in time critical situations

2. Group will develop guidance for next steps in coordination between 9-1-1/PSAP's, EMS, and hospitals in time critical situations
3. Group will develop guidance for provider education around TCD time windows and state and community plans for TCD patients
4. Group will discuss current status of pre-arrival instructions and EMD as related to TCD patients and develop recommendations as necessary
5. Group will discuss options and develop guidance for striving to meet TCD time windows in dispatch in rural and urban settings (in conjunction with the rural-urban work group tasks a, band c)
 - a. Group will develop guidance for transport options in common scenarios in rural areas for time critical conditions
 - b. Group will develop guidance for transport options in common scenarios between rural and urban areas for time critical conditions
 - c. The group will develop guidance around time windows and activities that occur within and outside of those time windows in common scenarios.
6. Group will discuss and develop guidance on performance improvement and data indicators to link 9-1-1/PSAP's with the emergency medical care TCD system

Scope of the project

- Little or no additional funding available—participants' time and contributions and existing DHSS staff will support efforts
- Will span all three arms of TCD system—trauma, stroke and STEMI
- Recommendations produced by group should strive to reflect process at each system component, or each point of the TCD circle, in rural and urban settings and their intersection
- Approximately eight-month project for developing dialogue and completing core tasks and end products. At that time, will evaluate if there is a need for the group to continue
- End products to be available by winter 2012.

Desired outcomes and end products

1. An understanding of system operations, requirements, demands, and constraints for 911/PSAP partners
2. An understanding of how the 9-1-1/PSAP's, EMS, and hospitals can build on existing coordination, collaboration, and integration with one another
3. Consensus and guidance around PAI and EMD for TCD patients
4. Identification of key data elements for 9-1-1/PSAP for inclusion in the TCD registry
5. Identification and/or development of key education messages and resources for 9-1-1/PSAP's for trauma, stroke, and STEMI patients
6. Identification of resource gaps and needs for time critical patient processes
7. Guidance for dispatch, time window goals, and options to strive towards meeting those goals as identified in state or community plan for time critical patients
8. Identification of potentially shared resources, for example, educational resources
9. Recommendations for incorporating 9-1-1/PSAP's into quality assurance functions that should be done on local, regional and state level
10. Recommendations for specific training and supports

Summary of TCD Task Force 9-1-1 Coordination Recommendations

The TCD Task Force produced several recommendations on how to achieve coordination between 9-1-1/PSAPs and pre-hospital and hospital elements across geographic regions in the state. The group identified examples of existing processes around Missouri that could be modeled and developed recommendations by which to improve 9-1-1 coordination in the system.

I. Current Process: Examples of current processes include

9-1-1 in coordination with EMS services using EM System;

In urban areas 9-1-1 tracks which trauma centers are open or on diversion then share the information electronically with or EMS crews ask for it;

9-1-1 handle diversions according to regional plan and patient transported by local protocol;

9-1-1 calls go to law enforcement and then transferred secondarily to fire/EMS directly or verbally;

Larger centers using EMD, smaller agencies not using EMD mostly secondary to cost;

In areas with no dispatch center, calls go directly to the service, in other areas calls are transferred from one center to another or police PSAP transfers call to EMS when part of a hospital system. In some areas a central 9-1-1 center takes call and routes to local PSAP and call is then transferred to hospital and can also transfer call data and/or the call.

II. System Requirements/Demands

Adequate staffing

Appropriate training and education, including on local protocol/community plan/state plan on how manage patients, education on system;

Share state resource list with providers; MOU's/Mutual Aid Plans; Communications Resources; Guidelines/Transport Protocols; available technology and communications resources

Adequate funding for staffing, training/EMD and PAI capacity and continued certifications and quality control

Maintain, update technology

Use of EMSsystem

Central coordination point for sharing of information and education

III. Available resources include

ORH FLEX grant;

Other grants through DHSS;

Shared resources- central location for scripting and instructions, processes that work,

Information and resources;

Trauma-Preparedness Simulation based training, develop into something similar and applicable to 9-1-1/PSAP providers;

Self-based learning modules- ex simulated audio script, either purchase or license, create

Web-based training;

Develop/Participate in: educational, training, combined/universal for trauma, stroke, STEMI and specific to trauma, stroke, and STEMI; education on what is needed for early access and early recognition.

IV. Direction for 9-1-1/PASP Providers

EMD/PAI: 3 options

1. National EMD certification- eg APCO, NAEMT, Power phone; increase access in rural areas; determine what percentage of 9-1-1/PSAPs using EMD/PAI and have medical director and what portions of state not covered by EMD and medical director; method of prioritization of resources; emphasize management principles/PAI/recognition of problem and instruction; requires medical director.

2. State EMD model

Goals: Recognition of stroke, STEMI, trauma; correctly identify patient subset that will need specific instructions; basic questions and pre-arrival instructions- eg bleeding-how to stop/slow; chest pain and ASA; no pulse/respirations, CPR; Recognition of patient types; Recognition of interventions needed; Recognition of available state resources and levels of care and their roles.

3. Hybrid of state and national EMD models

Recommend creating state specific education for 9-1-1/PSAP providers, with recommendation to follow one of the national EMD programs. The state will not create it's own EMD/PAI, rather it will outline the key principles with which 9-1-1/PSAP providers need to be familiar. Consider creating questions and examples, recommendations on correctly identifying patient groups, creating instructions, emphasis on management principles/recognizing problem and instructions, recognition of intervention needed, and recognition of available resources; can model off of existing documents.

Require training and provide CEU's? Goals include provision of guidance on what questions to ask, how to identify patients correctly, and what instructions need to be provided.

If develop a program,

draw together public domain information;

adopt as an awareness program;

educate that EMD available from three national sources; if not available to providers develop some educational information for them until they are able to participate in EMD;

include training and models of care, expectations for TCD;

stay with TCD chief complaints/key categories, stay generic; provide answers to the questions without asking the questions;

educate on why a 9-1-1/PSAP provider needs EMD/PAI capability;

take list of determinant codes and tie back to confirmed trauma, stroke, and STEMI activation/diagnosis and link to key words and questions most frequently associated with those conditions;

Need baseline data from multiple systems with rigorous scientific method to identify broad categories, cross codes to cards, and determine key words, questions, and positive predictive value for trauma, stroke, STEMI diagnoses. Then identify surrounding determinant codes that might also need to consider. Next broaden to develop PAI in context of TCD.

V. Quality Improvement

1. Regional EMS councils- invite 9-1-1/PSAP providers to participate; create list of data elements from those that 9-1-1/PSAP centers report nationally, examples of data sets and elements; 9-1-1 data points be carried forward by EMS and linked through the system; define when contact starts- call taking, response time, primary/secondary PSAP contact times- need real time 9-1-1 first contact;

2. Pilot project and methodology- aggregate case study; difference between patient groups whose calls were handled differently- EMD and not EMD; need call handling times for 9-1-1 and start clock at point zero (original call time versus patient outcome);

Start with basic PI question; need to automate data mining and upload from pilot sites; need to be able to pull data by patient type; chose 25-50% of those patients for chosen time period; then integrated with pre-hospital and hospital process;

Separate out medical calls from public safety calls; easier at secondary PSAP/dispatch because already have good linkage with EMS and hospital;

Really need to work with primary PSAP (may dispatch ambulance for example from Sheriff's office or transfer call to secondary PSAP that dispatches);

Data template from EMD accredited centers; outcome data gets rolled up into summary report; need QA to ensure following protocol; with case entry can identify chief complaint and echo calls;

Establish baseline for study- pre-post system implementation;

Examples of specific data elements:

time call comes into 9-1-1

time 9-1-1 contacts ground/air/first responders-EMRA's

time resource was dispatched (BLS/ALS), EMS (ground/air) time called and dispatched
(can get from MARS)

need times for primary and secondary PSAP's

determinant drift- look for over and under triage, FP/FN rates

time to primary PSAP, time to secondary PSAP and time to EMS

time to balloon (end intervention) from 9-1-1

determine what proportion of delay is due to what and what can be done about that issue

what proportion of TCD patients identified positively

what proportion of time appropriate resource sent and gets patient to appropriate level of care

number of calls to 9-1-1 and track back to trauma, stroke, STEMI confirmation-false positive and negative rate

EMS gets time of call to 9-1-1 (and original call to 9-1-1), time 9-1-1 called EMS, location EMS sent to

Need volunteer 9-1-1/PASP providers for pilot; determine how to move large pieces of data; need to know which 9-1-1/PSAP's have which resources;

Need to identify that a TCD patient recognized/how identify TCD subset, that correct resource sent and patient sent to appropriate level of hospital care.

VI. Education

Include outreach to 9-1-1/PSAP providers- include separate education campaign for 9-1-1/PSAP providers; providers need background on the system and what needs to be done with these patients; important for 9-1-1/PSAP providers to be familiar with transport protocols, companion document, and guidelines; determine what information needed, CEU's if possible;

Pre-post questions to test impact; create speakers bureau/power point readily available, purchase existing learning modules (ex Health Stream);

Use existing messaging from Public and Professional Education work groups to message about system and have specific education for 9-1-1/PSAP providers; long-term regulatory language to protect 9-1-1 data;

Pair TCD recognition with 9-1-1 – add non-visual cues to transport protocol for 9-1-1/PSAP's;

Merge principles of EMD cards with TCD guidelines and protocols; share list of state resources and state manual with 9-1-1/PSAPs;

Modeling for education, processes, feedback, dispatch, and inter-facility transfer;

Incorporate 9-1-1 providers to help with public education.

VII. How Link patients from 9-1-1, pre-Hospital to Hospital

Identifiers: Ring time, what time service provided, standard to record times, 9-1-1 asks for age and not DOB, provide service requested and location to EMS, time of call and incident address;

Will depend on the region; perform outreach and dialogue to build on models/framework including for education, process development, feedback, dispatch, and inter-facility transfer; develop framework/recommendations for starting dialogue;

Pair patient outcomes with 9-1-1 outcomes, consider aggregate outcome data;

Tie EMD/PAI to recommendations for TCD System:

- what does it mean for the system and provider

- incorporate into system-based partnership with 9-1-1/PSAP providers

- two levels of information- first, broad information about the system, anticipation that volume of 9-1-1/PSAP calls for trauma, stroke, STEMI will increase secondary to increased public education, anticipation that public will have certain expectations of the system, recommendation to use EMD/PAI; second, need analysis of how codes, key questions/words link to confirmed trauma, stroke and STEMI activations/diagnoses in Missouri

Help dispatchers create and implement their own processes, more information on recommendations, guidance on what things to consider in the process;

9-1-1/PSAPs develop relationships with local EMS and hospitals or build on existing ones, develop shared processes on local level;

Provide more knowledge/training on injury, stroke and STEMI;

TCD support for the process:

- speakers bureau, presentations, education on EMD, dissemination of data from any study looking at determinant codes, key words/questions reliably link to confirmed trauma, stroke, STEMI activations/diagnoses

Creation of general process/flow charts for individual 9-1-1/PSAP modification/adaptation and use.

VIII. Regional Integration

Recommend continued 9-1-1 integration- local/regional/state and pre-hospital and hospital;

Develop shared local and regional processes.

IX. Next Steps

Begin local, regional, state, planning for next steps;

Develop pilot program for collection of identified data elements;

Explore additional resources for 9-1-1 provider education for TCD conditions, in particular for rural providers.



Right Care. Right Place. Right Time.

TIME CRITICAL DIAGNOSIS SYSTEM OVERVIEW AND FACT SHEET

9-1-1/PSAP TCD System Background

Time Critical Diagnosis System

Missourians expect timely and appropriate emergency medical treatment when suffering from an injury, stroke or heart attack. Missouri has launched an exciting new initiative – the Time Critical Diagnosis System – to improve health outcomes for patients who suffer trauma, stroke or heart attacks known as ST-Elevation Myocardial Infarction, or STEMI.

Missouri was the first state to comprehensively integrate common processes for the time critical conditions of trauma, stroke, and the potentially fatal form of heart attack known as STEMI. All of these conditions require quick assessment, diagnosis and treatment by a facility that can provide timely, definitive care to minimize risk for preventable complications and death.

Missouri enacted laws (sections 190.200-190.245, RSMo)1 in 2008 that created the Time Critical Diagnosis (TCD) System to provide medical care for these patients requiring time critical diagnosis and treatment for trauma, stroke and STEMI.

Experts from the emergency medical care system made recommendations to the Department of Health and Senior Services about what should be included in the regulations to implement this system. DHSS has actively sought input on the proposed rules since 2007 through more than 10 statewide meetings, six regional meetings, an on-line survey and more than 28 conference calls and webinars. These efforts have produced a wide range of suggestions and advice from experts in the field. The department also has had public discussion on the standards to obtain a full understanding of the implications of the proposed rules. More than 700 individuals from multiple hospitals and emergency medical services agencies have requested to be on the list-serve for these notices. The DHSS web pages that carry TCD information, including drafts of the draft proposed regulations, has received more than 32,000 hits monthly.

Proposed Regulations are available on the department Web site at http://www.dhss.mo.gov/TCD_System/WhatsNew.html. The regulations include:

1. **Definitions and Abbreviations Relating to STEMI Centers**
2. **Standards for Level I, II, III, and IV STEMI Center Designation** – describes designation standards in the following sections: general (requirements for the STEMI program, e.g., medical director and team functions, policies and agreements for STEMI care); medical staffing; hospital resources and capabilities; hospital performance improvement, patient safety, outreach, public education and training programs; and research.
3. **Application process and application for STEMI Centers** – outlines requirements for applications and process department uses for approval.
4. **Definitions and Abbreviations Relating to Stroke Centers**

5. **Standards for Level I, II, III, and IV Stroke center designation** – describes designation standards for the following sections: general (requirements for the stroke program, e.g., medical director and team functions, policies and agreements for stroke care; medical staffing); hospital resources and capabilities; hospital performance improvement, patient safety, outreach, public education and training programs; and research.
6. **Application process and application for Stroke Centers**-- outlines requirements for applications and process Department uses for approval
7. **Triage/Transport Protocol for Stroke and STEMI Patients** – establishes protocols for transporting suspected STEMI and stroke patients according to severity and time of onset to the designated STEMI or stroke center where resources exist to provide appropriate care.
8. **Community Plan**- details the criteria and approval process for a community or regional plan for trauma, stroke, and STEMI patient transport

Trauma regulations and documents undergoing review and update:

1. Trauma Center Designation
2. Pediatric Trauma Center Designation
3. Level IV Trauma Center Designation
4. Pediatric Trauma Center Regulations
5. Trauma Triage/Transport Protocol with companion documents

What is the TCD System?

The TCD System coordinates and links public education and prevention programs, 911 emergency phone system, ambulance services and hospitals designated for care of trauma, stroke and heart attack patients, rehabilitation services, and quality improvement initiatives. A quick response and quality care is coordinated to increase the rates of survival and level of recovery from these time critical conditions. This new statewide system, developed in line with best practices and built around the patient, provides the best care for Missouri citizens 24 hours a day, seven days a week. The system allows resources to be shared and maximizes the effectiveness of Missouri's health care dollars for urban and rural residents.

The partners in this initiative, the Missouri Foundation for Health, the Department of Health and Senior Services, and the numerous stakeholders and providers, embarked upon this journey after assessing outcomes in Missouri for trauma, stroke, and heart disease. This approach was in keeping with the three core functions of public health and the 10 essential services of public health. Following the format assessment of Missouri's outcomes, the group embarked on policy development, which will be followed by assurance that the system objectives and essential services are met.

INJURY-TRAUMAⁱ

The Problem:

- Trauma is the fifth leading cause of death in Missouri, first leading cause of death in those age 1-44.
- It is the most frequent cause of visits to the emergency department, causing more than half a million visits in 2006.
- Injuries account for the second highest total for inpatient hospital charges – \$2 billion in 2006.
- Compared to the entire United States, Missouri has lower rates of emergency department visits for all three major categories of injuries – accidental, assault and self-inflicted. But it unfortunately has death rates from injuries that exceed the national rates for accidental injuries, suicides, falls, and motor vehicle injuries.
- It is also noteworthy that Missouri's death rates for unintentional injuries have increased 25 percent between 1991 and 2006. Even more alarming, our death rates for unintentional fall injuries have increased 73 percent.
- There are gaps, particularly in rural areas of Missouri, for timely access to a trauma center.

The Solution:

- Research clearly shows that an organized, integrated, system based on regional medical resources saves the most lives and decreases permanent injuries.ⁱⁱ
- Missouri has 29 designated trauma centers that are integrated into the continuum of care, including prevention and rehabilitation and operate as part of a network of trauma-receiving hospitals.ⁱⁱⁱ The process for designating hospitals as trauma centers has been in place since the early 1990s.
- In order to ensure access for definitive treatment, regardless of where a Missourian is injured, many trauma health care experts and partner groups have joined together to address these gaps as part of the work to create the Time Critical Diagnosis System.

***Trauma** is injury to a tissue or organ resulting from the transfer of energy from the environment. Examples of common types of injuries that require trauma care include falls, motor vehicle accidents, assault, abuse, burns, poisoning, and over-exertion.*

ST-ELEVATION MYOCARDIAL INFARCTION (STEMI)

The Problem:

- Heart disease, including STEMI, is the leading cause death in this state.^{iv}
- Heart and circulation diagnosis caused the highest total of inpatient hospital charges, at \$4.2 billion in 2006.
- In 2004, Missouri's heart disease death rate was an alarming 13.5 percent higher than the national rate.
- Missouri was in the bottom ten (45 out of 50) in coronary heart disease death rates.^v
- The prevalence of heart disease was higher than the national average, as Missouri ranked 9th among the 50 states in heart disease prevalence in 2005.^{vi}

The Solution:

- Specific therapies, administered to STEMI patients within 90 minutes of symptoms, have proven to reduce mortality and disability.^{vii,viii}
- Missouri's organized trauma system provides a model for organizing an integrated and coordinated approach for care of the STEMI patient.
- Recently enacted state laws provide the Department of Health and Senior Services the authority to create designated STEMI centers that meet standards to provide definitive and timely treatment for STEMI patients. (section 190.241, RSMo)
- The state laws (section 190.243.1, RSMo) state "Patients who suffer a STEMI, as defined in section 190.100, shall be transported to a STEMI center."

*A **STEMI** is a type of heart attack, for which impaired blood flow to the patient's heart muscle is shown by the ST-segment elevation, in ECG analysis. A STEMI is one type of heart attack that is a potentially lethal condition for which specific therapies, administered rapidly, reduce mortality and disability. The more time that passes before blood flow is restored, the more damage that is done to the heart muscle.*

STROKE

The Problem:

- Stroke is now the fourth leading cause of death in the state.^{ix}
- In 2004, stroke was the third leading cause of death both nationally and in Missouri. As national and state systems continue to evolve, those systems have improved outcomes.
- In 2004, Missouri's stroke death rate was 11 percent higher than the national rate.
- Unfortunately, Missouri ranked low (40 out of 52) in the comparison of stroke death rate between states.
- In 2004, Missouri was ranked 7th in stroke prevalence.
- For those that experience a new or recurrent stroke each year, approximately 23 percent will die, 15 percent to 30 percent will be permanently disabled and 20 percent will require institutionalization during the first three months post-stroke.^{x,xi}
- Only a small percent of ischemic stroke patients get definitive care within the 3 hour window recommended.

The Solution:

- Prompt treatment within 3 hours for acute ischemic stroke reduces disability and improves outcomes.
- As is the case for STEMI, recently enacted state laws provide the Department of Health and Senior Services the authority to create designated stroke centers that meet standards to provide definitive and timely treatment for stroke patients. (section 190.241, RSMo)
- The state laws (section 190.243.1, RSMo) state "Patients who suffer a stroke, as defined in section 190.100, shall be transported to a stroke center."

Stroke is a sudden brain dysfunction due to a disturbance in brain circulation. The resulting impairments include but are not limited to paralysis, slurred speech, and/or vision loss. Ischemic strokes account for over 80-87 percent of all strokes and are typically caused by obstruction of cerebral blood vessels. Hemorrhagic strokes account for the remaining strokes and are typically caused by rupture of a cerebral artery.

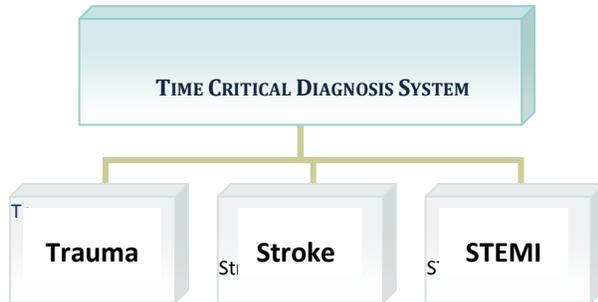
THE RESPONSE

Impressive efforts have combined to improve statewide, coordinated emergency medical services through the Time Critical Diagnosis System.

- Missouri is the first state to integrate common processes for the time critical conditions – trauma, stroke, or the potentially fatal form of heart attack known as STEMI. All of these conditions require quick assessment, diagnosis and treatment by a facility that can provide timely, definitive care to minimize risk for preventable complications and death.
- Missouri enacted laws (section 190.200-190.245, RSMo)^{xii} in 2008 that created the Time Critical Diagnosis (TCD) System through which emergency medical care is provided for patients who require time critical diagnosis and care.
- Two statewide task forces were formed and compiled recommendations on how to establish the TCD system and improve emergency medical care for stroke, STEMI and trauma.
- The State Advisory Council for Emergency Care, Trauma Subcommittee and Stroke, and STEMI Implementation Work Groups have been actively engaged in developing the regulations, transport protocol, and information for classification of trauma, stroke and STEMI patients. The groups have established information and resources for governing field triage, emergency medical service, and rules for designated centers. They are also working on professional and public education, quality assurance and performance improvement. More than 500 individuals have participated in these efforts since fall 2008.
- The American College of Surgeons conducted a review of Missouri’s trauma system in 2009 and the National Highway Safety and Traffic Administration conducted a review of the statewide emergency medical services program in June 2010. These two reviews provide recommendations for improvements within the TCD system.
- Regulations have been drafted to create Stroke and STEMI centers (Levels I-IV) and add Level IV Trauma Centers. Regulations are also drafted to define the transport protocols for TCD patients and provide an approval process for community and regional alternatives to the transport protocol.
- Information for pre-hospital and inter-hospital processes has been drafted by the TCD Task Force as a resource.
- Sources for funding to provide staff and administrative supports to complete the designation process have come from a range of sources, including the State of Missouri, Missouri Foundation for Health, Centers for Disease Control and Prevention and other grants. Funding to upgrade and sustain core infrastructure continues to be sought for this complex system of care.

THE TCD SYSTEM

The TCD system is a comprehensive, coordinated statewide and regional network that delivers emergency medical care under one banner rather than through three separate systems.



The TCD system represents the continuum of services. It begins with public education about prevention, recognition of signs and symptoms and the need to seek immediate medical care. It circles through the series of system components that emphasize evidence-based best practices for incident recognition, first aid, 911 access, response coordination, pre-hospital response, transport, emergency department care, acute medical care and rehabilitation. Finally, it incorporates quality improvement processes throughout the system. The continuum model is shown below:



The TCD system allows resource sharing and coordination at many different levels to decrease duplication and costs for services similar for each condition. These include 911 and emergency medical dispatch, pre-hospital response and transport and the center designation process for hospitals that meet regulatory criteria. At the same time, the TCD system supports the unique and distinct care required by each condition. This includes assessment, diagnosis and treatment by those hospitals that meet specific care and capacity requirements for specialty center designation.

The experiences and results from numerous other states demonstrate both the feasibility of, and actual and potential benefits from, a systemized approach to emergency medical care for trauma, stroke and STEMI. The TCD system in Missouri, however, further advances the concept by creating an umbrella system for the time critical care for stroke, STEMI, trauma and other potential conditions for which future advances will warrant time critical care. While other states have organized responses to each of these conditions, independently, no state had approached them on such an integrated systems level as represented by the Missouri TCD system.

HOW DOES THIS AFFECT YOU AS A 9-1-1/PSAP PROVIDER?

As mentioned above, one fundamental goal of the TCD System is to integrate each point of care in the emergency medical care system affecting a patient with a time critical emergency, including 9-1-1/PSAPs. This will facilitate more timely medical response and intervention, resulting in better recovery and survival for Missourians. The work underway has benefitted from coordination and collaboration with and input from 9-1-1/PSAP providers as part of an ongoing TCD work group around 9-1-1 integration and coordination. This work group has compiled a series of recommendations for the TCD system regarding integration and coordination with 9-1-1 providers. These recommendations are available at:

<http://health.mo.gov/living/healthcondiseases/chronic/tcdsystem/index.php>

As part of the public education campaign for the TCD System, the public is encouraged to call 9-1-1 in the event that they experience symptoms of a severe injury, heart attack, or stroke. We anticipate that this will result in an increased call volume to 9-1-1/PSAPs for these complaints. In addition, the public education will focus on the recognition of the signs and symptoms of these events. Thus, we anticipate that the public, being more educated around these time sensitive, potentially lethal or disabling health events, will be seeking direction and support from the 9-1-1/PSAP providers.

Being a better informed public with knowledge about signs and symptoms of severe injury, heart attack, and stroke, the need for time sensitive treatment and management, and the TCD system, we anticipate that the public will come to expect an informed response and interaction with 9-1-1/PSAP providers. We encourage 9-1-1/PSAP providers to implement processes and procedures, including the provision or facilitation of emergency medical direction and pre-arrival instructions, to manage these types of calls.

In addition, we recommend that 9-1-1/PSAP providers become familiar with the system structure, resources, goals, and integration efforts. It will be especially critical to understand the time constraints and parameters, patient goals of the system and how those affect patient transportation and destination determination. We also encourage providers to become familiar with the levels of centers, transport protocols and community plans, and guidelines that pre-hospital and hospital providers in your regions may be using.

Processes and Procedures

It is recommended that 9-1-1/PSAP providers should anticipate an increase in medical calls related to severe injury, suspected heart attack, and stroke. As such, providers should develop their own processes to manage these calls. Recommendations for those processes include:

It is recommended that providers should be familiar with the principles behind the phrase “right care, right place, right time” for trauma, stroke, and STEMI.

It is recommended that providers should be familiar with cues from callers that would suggest a severe injury, heart attack, or stroke and the questions used in the profession to illicit that information. For those that use a national EMD program, it is recommended that providers continue to be practiced with the management of suspected severe injury, stroke, and heart attack calls. For those that do not use a national EMD program, it is recommended that providers adopt an EMD process and in the interim have a tested process in place for the management of these time sensitive calls.

It is recommended that providers should implement a process, emergency medical dispatch being the gold standard, to manage these calls, to provide pre-arrival instructions to the caller, and to dispatch the appropriate level of pre-hospital resource.

It is also recommended that providers are familiar with the levels of trauma, stroke, and STEMI centers in the state, how EMS will triage patients to those centers based on patient presentation and the applicable time intervals for treatment, and how that triage process affects the dispatching of resources.

It is recommended that providers should also participate in their local and regional emergency medical care system coordination and planning efforts and further develop relationships, plans, and shared processes with pre-hospital and hospital providers.

Current and Completed Action to Implement Time Critical Diagnosis System:

- *Promulgate regulations to 1) designate four levels of stroke and STEMI center, 2) add a fourth level to the existing three levels of trauma centers, 3) establish transport protocols, and 4) establish a process for community and regional plan alternatives.*
- *Begin expanded center designation process.*
- *Compile professional education guidelines for hospital and out-of-hospital agencies*
- *Expand quality assurance system to support stroke and STEMI systems in addition to trauma*
- *Improve data management for performance improvement functions*
- *Identify supports to expand functionality of Regional EMS Advisory Committees to advise and make recommendations to the region and the Department of Health and Senior Services on how best to coordinate regional emergency resources; improve public and professional education; follow national standards and develop evidence-based guidelines; engage in quality improvement activities; and support cooperative research endeavors to improve emergency medical care in Missouri*
- *Coordinate efforts for public education and prevention of injury, coronary heart disease and stroke*

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