

For consideration @ RTAC Meeting
10/28/2008

**BIRMINGHAM REGIONAL
EMERGENCY MEDICAL SERVICES
SYSTEM
REGIONAL TRAUMA SYSTEM PLAN**

DRAFT

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TRAUMA PLAN

BACKGROUND

In the fall of 1993, a study was done by the Birmingham Regional Emergency Medical Services System (BREMSS) which showed that in patients meeting physiologically unstable trauma triage criteria of the American College of Surgeons, 60% were being transported to hospitals that did not have any organized trauma response. The BREMSS Executive Committee reviewed this data and as a result, in late 1993 the Executive Committee of BREMSS authorized a program to evaluate trauma in our region and develop an organized trauma care plan if appropriate. Representatives on that Task Force were included from throughout the region and represented a variety of trauma interests. Doctors' Robert Carraway and Richard Treat were appointed Chairman and Co-chairman of that committee. At the first committee meeting the current trauma care status in the Region was discussed and it was the unanimous opinion of all committee members that trauma care could be improved in our region through the implementation of an organized trauma care program. The committee worked until December of 1994 in developing such a plan.

At that time there was no legislated authority for the implementation of trauma programs or trauma center designation, and there was no reason to think that status would change in the reasonably foreseeable future. Therefore, the committee, after considerable discussion thought the development of a voluntary program was the only option currently available. The committee clearly recognized that such a program might not be the ultimate best possible trauma program, however, the committee also strongly felt that the implementation of a well designed and supported program would improve trauma care. It was the opinion of the committee members that this type of program could be an interim step to a more advanced trauma program, and it was clearly expected that any program developed by this committee would have improvement modifications implemented based on ongoing evaluations of the program function. Other areas in the country had used this concept to develop successful trauma systems.

Mechanisms for the development and implementation of improvements and changes are specifically built into the program design. A consensus building process was used in the original trauma plan development. Committee members discussed each and every aspect of the program as development proceeded with the groups they represented.

The plan was revised over the years with the most recent revision in June of 2001.

Passage of legislation by the Alabama Legislature in 2007 to create a statewide trauma system necessitates the latest revision of the plan. Compliance with the legislation and subsequent rules developed by the State Trauma Advisory Council (STAC) and the Alabama Department of Public Health – Office of Emergency Medical Services & Trauma (ADPH/OEMS&T) are included in this plan revision.

TRAUMA SYSTEM GOALS

The primary goal of this Regional Trauma System plan is:

Develop a plan which continues the decreased trauma mortality and morbidity in BREMSS' seven counties of Blount, Chilton, Jefferson, Shelby, St. Clair, Walker, and Winston, and complies or exceeds all ADPH/OEMS&T requirements.

In order to accomplish this, a number of specific processes are deemed essential. These are:

1. The ability to rapidly and accurately identify victims of incidents who have sustained or have a high probability of sustaining serious or life-threatening injuries.
2. Patients who have sustained serious or life-threatening injuries or have a high probability of such injuries must receive care in a hospital that has a trauma response program in place which is capable of providing immediate and comprehensive assessment, resuscitation, and definitive care, plus establishing rehabilitation access when needed.
3. There must be continuous and effective region-wide coordination of Prehospital and hospital care resources so that trauma victims will most expeditiously get to the closest hospital with adequate trauma resources so that their care can be provided in a manner that is both appropriate and timely while establishing and maintaining continuity. To accomplish this process there must be the ability to track trauma patients.
4. The program must allow all hospitals with the necessary resources, the ability to participate in the system (an inclusive system) and receive trauma patients if they are willing to meet the system Trauma Center and operational criteria as established by the Alabama Board of Health after recommendation by the STAC and ADPH/OEMS&T.
5. The system must have an ongoing and effective Continuous Quality Improvement (CQI) Program in order to assure continuing appropriate function in providing the highly specialized care necessary in cases of serious and critical injuries. This program will include evaluation of prehospital management, hospital management, and overall system function. A standard prehospital dataset and hospital dataset (Trauma Registry) will be required of all system participants, which will allow uniform system evaluation to document the effectiveness of the function of the trauma program. This program must comply with all ADPH/OEMS&T requirements inclusive of data sharing at all levels.

This program involves the care of only a small percentage of the total trauma population as only those patients who have actually sustained or have a high probability of having sustained serious or critical injuries will be entered in the Trauma System. It is estimated that only 10-12 percent or so of the total trauma population would meet these requirements. The remaining + or - 90 percent of the trauma cases are not entered into the system and will continue to be cared for at their local community hospitals. Specific trauma center function obligation of hospitals as part of this system would only relate to those trauma victims entered into the system.

REGIONAL TRAUMA SYSTEM BRIEF OVERVIEW

Systems require an oversight authority to meet Alabama Board of Health requirements as well as project concept, overall responsibility, developmental aspects, implementation, operation and evaluation of continuing activities. Such an entity is commonly referred to as a lead agency and in this program the lead agency is the Birmingham Regional Emergency Medical Services System. The authority of this agency is derived from specific activity goals and plans approved by the ADPH/OEMS&T and thus, the State Board of Health.

The system involves organization of already existing resources into a program providing comprehensive care for trauma patients through all phases of their management from the moment of injury through rehabilitation in the counties of Blount, Chilton, Jefferson, Shelby, St. Clair, Walker, and Winston. Trauma patients may well have injuries that cause vital function instability with an immediate threat to life that may or may not be obvious. Thus the program must provide for rapid movement of patients through all initial phases of management with the provision of optimal care at any time a critical situation is present or any significant changes in the patient status develop. The two basic patient management components to this system are the prehospital providers and individual hospital organizations. The system function involves the compliance with protocols, which are developed by the STAC and ADPH/OEMS&T and are included in this plan. The entry criteria are intended to identify patients with actual or a high potential for serious or critical injury. It is estimated that only approximately ten to twelve percent of injured patients would fit these criteria. Injured patients that do not meet trauma system entry criteria (approximately 90% of injured patients) do not have actual or significant potential for serious injury and would not need protocol directed specific transport to or treatment by a Trauma Center. The system protocols for triage and transport with specific hospital destination would not apply to trauma patients who do not meet trauma system entry criteria. Hospitals participating in the Trauma System would not incur any special obligations to patients who do not meet criteria for being entered into the trauma system. Upon determination that a patient is in the small percent of actual or possible major or critical injury victims and would benefit from specialized Trauma Center management, specific entry into the Trauma System will be accomplished. Entry into the system means that a patient meets specific primary triage criteria indicating an actual or high probability of major or critical injury and the specialized Trauma System resources will be used in their care. The medical care provider reports all trauma system patients to a centralized communication center, the Alabama Trauma Communications Center (ATCC). The ATCC monitors the trauma resources of all Trauma Centers on a minute-to-minute basis. With this system status knowledge and the application of specific secondary triage protocols based on physiologic status, anatomic injuries, and trauma mechanism severity, a determination can be made as to the relative potential intensity of care needed for that patient. The closest system hospital with available trauma resources meeting the level of need can then be selected as the appropriate destination for that patient using previously established protocols as part of the Regional Trauma Plan. Hospitals participating in this system and receiving trauma patients through the ATCC must have organized response systems, including equipment and facilities plus trained and committed personnel using organized management plans such as protocols of the American College of Surgeons Advanced Trauma Life Support course in providing management for major trauma victims entered into the system. A regional trauma database is in operation which allows monitoring of the magnitude and scope of trauma in our region. This database is used to document appropriateness and quality of care

and also in the determination of teaching and training needs in trauma. It will be used in conjunction with other ambulance service and hospital evaluations in a continuous quality improvement program to provide compliance with all ADPH/OEMS&T rules and requests.

Children under the age of 15 years have special trauma care needs. As a result of these special needs, patients in this age range will be directly transported to the closest available green status Trauma Center with a Level I Pediatric Intensive Care Unit (as defined by the American Academy of Pediatrics) if within regional transport-time guidelines.

In the following situations, the patient should be transported IMMEDIATELY to the closest hospital with full-time emergency physician coverage (Trauma Center Preferably) as coordinated by the ATCC:

1. The EMS provider is unable to effectively manage the airway or ventilate the unstable patient.
2. The EMS provider is unable to stop the bleeding of a patient with severe hemorrhage.
3. The EMS provider is unable to establish/maintain an IV to provide volume resuscitation in an unstable hypovolemic patient.

Finally, it is important to emphasize that Trauma is a surgical disease. The emergency department plays a critical role in trauma management, but surgery and critical care are pivotal services in determining the survival and recovery of trauma patients. Surgical leadership of hospital trauma programs is therefore, essential in order for hospitals to participate in the Trauma System. This leadership role must be clearly defined within the Hospital Trauma Plan along with specific appropriate authority to carry out that leadership role. Evidence of continuing leadership must be demonstrated through surgeon participation in the Regional Trauma System Activities and through the individual hospital CQI programs.

COMPONENTS AND ORGANIZATION

The Trauma System is comprised of a number of separate components, which are organized and work together as a system. The individual components and elements, which make up the system, will be described in this section.

I. PREHOSPITAL COMPONENT

EMS units are an integral part of the Trauma System and their organization is not changed under the trauma system plan. There are, however, two specific issues regarding the prehospital component of the Regional Trauma System.

- A. All licensed EMS personnel are required to have a basic knowledge and awareness of the Trauma System elements and system function. This specifically refers to the entry criteria and communications. If they are unclear about entry criteria or system function this information can be easily obtained on a 24 hour a day basis from the ATCC so that they can then apply the system trauma protocols in field care situations.

II. HOSPITAL COMPONENT

Hospitals may participate in this system on a voluntary basis. Standards have been developed by the STAC and ADPH/OEMS&T based on the American College of Surgeons' Resources for Optimal Care of the Injured Patient Document. These are present in Appendix A and have been approved by the State Board of Health. Each hospital is able to determine whether they are on-line (have adequate resources currently available and are able to receive patients based on system operations protocols) or are off-line (do not have adequate resources currently available and do not wish to receive patients per the Trauma System). The hospitals are able to go on-line and off-line at will. Each hospital must have a General/Trauma Surgeon primarily responsible for oversight of the Trauma Program. This responsibility includes:

1. Working with administration to maintain resources for that level of Trauma Center.
2. Assuring that call schedules providing physician availability as per their chosen Trauma Center level are prepared on a monthly basis.
3. Establish/maintain basic trauma care protocols for the Trauma Center.
4. Overseeing the trauma center Trauma CQI Program including database collection and reporting to the Regional Trauma Advisory Council (RTAC) and ADPH/OEMS&T, oversight responsibility for the Trauma Center Trauma CQI Program per ADPH/OEMS&T requirements, and participation in Regional Trauma System administrative and CQI activities as per the Regional Trauma Plan.

Participation in the Regional Trauma system is accomplished as follows:

1. The decision to participate or to continue to participate must be a joint effort between Hospital Administration and medical staff.
2. Hospital Administration and the medical staff carefully re-evaluate the Regional Trauma Program.
3. A joint decision is made (hospital administration and medical staff) that the hospital wishes to apply to participate, continue participation at the current recognized level, or change their level commensurate with their resource capabilities and the revised approved Trauma Center Standard (Appendix A).
4. Application is provided by ADPH/OEMS&T, and returned documenting the hospital's desire to continue participation or to change level of participation. ADPH/OEMS&T must have an application on file for each hospital so the application must be filled out even if the hospital is going to participate at the same level.

5. An on-site evaluation at each facility requesting a change in trauma center level is to be held to review the system design and function, and to evaluate the hospital based on the criteria for the requested trauma center level.
6. The RTAC will review the application and on-site evaluation report to document compliance with requirements and provide a report and recommendation to the ADPH/OEMS&T, who will forward the report to the STAC.
7. The STAC will make recommendation to the State Board of Health regarding hospital participation as a trauma center in the system. If approved, the hospital will become part of the system by executing a contract with ADPH/OEMS&T documenting their willingness to actively participate in the system and maintain trauma center resources as per their chosen evaluated level and will be known as a Trauma Center.

Hospitals, therefore, must decide whether to participate in this system or not based upon ability to meet resource standards for a chosen individual Trauma Center level, medical staff desire to participate and support this program, and hospital administration desire to participate in and support the Regional Trauma Program.

If a hospital in the current system elects to remain at their current trauma center level, an application and contract between that hospital and ADPH/OEMS&T will replace the existing BREMSS agreement. No additional on-site evaluation will be performed.

III. COMMUNICATIONS COMPONENT

Communications are critical to the function of the Trauma System. Communications provide (1) essential knowledge of the overall status of prehospital trauma activities and trauma center resource availability on a continuous basis, (2) access to system organization and function protocols whenever such information is requested by prehospital personnel or hospital-based personnel, (3) a link between the field and Trauma Centers for the rapid exchange of information resulting in efficient prehospital care provision and trauma centers being able to best prepare for trauma victim arrival, (4) collection of uniform system wide data for both CQI activities and development of a regional trauma database. Providing all of these functions to the entire system on a continuous basis requires a central communications facility with constant communications capabilities to all prehospital units and participating hospitals, plus the ability to immediately and directly link the prehospital providers to the Trauma Centers. This entity is the Alabama Trauma Communications Center (ATCC).

The ATCC is staffed 24 hours a day by personnel with specific in-depth knowledge of the Trauma System design, function, and protocols. It is the primary responsibility of the ATCC to coordinate the Trauma System activities by maintaining and providing information whenever needed on the field status and trauma center status so this data can be used by the prehospital and trauma center personnel in providing care to patients meeting system entry criteria. The ATCC operates through system operations protocols.

The ATCC makes no primary decisions, but provides information about patient management and destination as per pre-established protocols for system function. The ATCC serves as a resource for such protocol information to EMS providers that may not be familiar with the protocols or the ATCC simply provides the coordination of prehospital and trauma center resource utilization for trauma management. Therefore, the general functions of the Alabama Trauma Communications Center are:

1. Assigns unique system I.D. number for each patient meeting system entry criteria for tracking throughout the system.
2. Collects brief prehospital database.
3. Provides information on system entry criteria based on OEMS&T protocols as requested by EMS providers when it is not clear if a patient meets entry criteria.
4. Maintains knowledge of the functional status of all system trauma centers at all times.
5. Maintains knowledge of the activity status in the prehospital setting at all times.
6. Provides information regarding secondary triage status of the patient based on approved protocols.
7. Coordinates patient destination, when patient meets system entry criteria, based on OEMS&T protocols as to the closest currently operational Trauma Center utilizing the secondary triage status of the patient and the system.
8. Coordination for optimal resource utilization using pre-established protocols for system function when there are either multiple victims in one event, or there are multiple simultaneous events in the region (which, of course, neither EMS providers nor individual hospitals could know about).
9. Establishes automatic communication link between EMS provider and receiving facility if requested or at the discretion of the ATCC communicator.
10. Records and enters prehospital data for Regional Trauma database.
11. Arranges inter-facility transfers of trauma system patients who are entered in the system by EMS or hospitals.

In addition to the above functions, in the event of a mass casualty situation the ATCC would serve as an established vital coordination link between on-site control and all Trauma Center resources in the region for the most rapid and efficient patient distribution in such circumstances.

An Emergency Resources Display is also part of the communications component. The Emergency Resources Display provides each participating trauma center and the ATCC

with the continuous real-time functional status display of all Trauma Centers. The Emergency Resources Display is a simple computer system with terminals at each participating trauma center and the ATCC. This system will provide a display grid listing each individual Trauma Center their Trauma Center level, and the primary resource components indicating the availability or non-availability of these individual components in each trauma center and therefore, their current trauma activity status. Each system trauma center will maintain the status notation of the primary trauma resources in that trauma center and therefore, their overall trauma activity level. The trauma centers will be able to change their resource availability status and activity level at any time. A record of trauma center activity status for the entire system will be maintained through the Emergency Resources Display at the ATCC and in each trauma center. Any change in trauma center status as made by trauma center personnel at its own display terminal will be automatically communicated to the central system monitoring station at the ATCC and also maintained in the trauma center computer. The ATCC maintains a consolidated system wide display status indicating the individual resource availability at the Trauma Centers and their overall functional status at any given time. This consolidated information table will be transmitted back to trauma centers. The system is maintained automatically by computers with automatic polling and display refresh. Each Region office will be able to access the ERD of its regional Trauma Centers through an internet link. ADPH/OEMS&T will be able to access the ERD of each of the regions through an internet link.

Numbers are color-coded - green for available, yellow for conditionally available, and red for not available.

Trauma center abbreviations are automatically color coded for on-line status (green-active, red-inactive) based on individual resource availability in the Trauma Center at that time. (See page 23)

The equipment for the Emergency Resources Display will consist of a color video monitor, a computer and a modem connected to a dedicated line, which does not enter the facility through the switchboard. The software will allow simple keystroke change of resource status by the Trauma Center personnel and this change will be transmitted to the central system monitoring station at the ATCC with this information then being immediately updated on all resource display monitors in the system. The central monitor station automatically polls the individual monitor stations in the system. If a station's computer fails to acknowledge the poll, that trauma center's information will be so noted on all resource display monitors in the system. If there is an isolated failure at a resource display at a trauma center that will not cause a total system fault but that trauma center will be so noted and the ATCC will call requesting the information directly. The system integrity is not dependent upon the operation of any single station. At least one level of redundant communications is available (land phone line, wireless data transmission, or VPN).

IV. DATA/CONTINUING QUALITY IMPROVEMENT COMPONENT

This component is absolutely essential for function of the Trauma System. In virtually any serious trauma/injury situation, the patient has a very limited ability to meaningfully select prehospital, trauma center and physician care. The efficacy of the initial care in these patients may have a pivotal role in determining their outcome. Therefore, there is a system responsibility to evaluate the system function to determine continuing effectiveness in the management of these major trauma victims. The Trauma Plan is designed with this component to be able to generate an overall system wide trauma database which would provide an overall look at trauma incidents, significance, care and outcomes, provide information for use in determining and developing trauma teaching programs, provide information able to be used in potential trauma studies, and utilization in evaluation of system function in the CQI Program. There are three basic elements of this component. The first is a standard trauma dataset that will be used to establish a regional trauma database at ATCC. The second element is the continuous quality improvement program of the trauma system at ATCC. The third element is the trauma registry data at each trauma center. All data from these three data sources is available to ADPH/OEMS&T to use in statewide trauma QI activities.

The Trauma CQI Dataset for trauma centers is that set forth in ADPH/OEMS&T rules requiring each trauma center to collect and report data for the trauma registry.

The second entity in this component is the continuous quality improvement (CQI) program for the Trauma System. This program is necessary to the Trauma System to document continuing function and allows the implementation of improvements in a system where the patients may not have the ability to make their own personal medical care choices and depend on the system for adequacy and completeness of care. This program will be system wide with the individual agencies basically doing their own CQI evaluations and reporting to a regional CQI workgroup as well as the ADPH/OEMS&T. The appropriateness, quality and quantity of all activities in the system must be continuously monitored in the areas of prehospital care, medical care of the patients in the trauma centers and overall system function.

The basic CQI process involves numerous specific steps to be performed by each individual entity their CQI effort. These steps are:

1. Assignment of a CQI manager to oversee the process in the organization.
2. Develop a written CQI program to evaluate patient care with regard to appropriateness, quality and quantity and as part of that program, patient care standards are established for use in the evaluation process. For prehospital programs, this simply may be the regional prehospital protocol. For trauma centers this may be a combination of ATLS protocols, plus additional standards as

deemed necessary or an individual set of patient care standards (protocols) developed by that Trauma Center. These programs are reviewed and approved by the Regional CQI Workgroup and the ADPH/OEMS&T and as part of becoming a Trauma System participating trauma center under the direction/extension of the CQI activities of ADPH/OEMS&T.

3. A method for CQI data collection is established by ADPH/OEMS&T.
4. CQI evaluations are undertaken by the individual system participants - EMS providers or Trauma Centers. This first involves the determination of specific audit filters. Mandatory Trauma Center audit filters include major and others as may be determined by the ADPH/OEMS&T. Other appropriate audit filters may also be evaluated. For Trauma Centers, external outcome comparisons are part of the evaluation process.
5. Determine the presence of CQI issues through the data evaluation process.
6. Discussion of CQI issues at the formal CQI Conference of each individual system participant - EMS provider or Trauma Center.
7. Develop a correction action plan. In general, action activities can be placed under the categories of professional resolution or administrative resolution.
8. Re-evaluation must occur to document the results and effectiveness of the corrective action plan. This is commonly called "closing the loop".

Adequate documentation of these activities is essential. In trauma centers a multi-disciplinary peer review process must occur. In Trauma Center CQI programs both medical care and Trauma Center function must be evaluated.

The (RTAC) CQI Workgroup has the goal of review of the entire Regional Trauma Program activities for appropriateness, quality, and quantity of activities and report such to all participants and ADPH/OEMS&T. That review is to include system administration/organization activities, plus prehospital care and trauma Center care review. The Regional Workgroup will document effectiveness of Trauma Center and EMS CQI evaluations through routine reports of these CQI activities provided by each participating entity to the Regional Workgroup. The Regional Workgroup will perform focused review of specific items as determined appropriate, but these reviews will include evaluation of both prehospital and Trauma Center activities. Death audit review is mandatory. It is expected that most issues will be resolved by developing an action plan in conjunction with the various Trauma System entities. A re-evaluation for results is to be undertaken. If it is determined that a change in system configuration or standard function should occur, a recommendation will be sent to the Regional Trauma Advisory Council (RTAC) for evaluation and report to the STAC and ADPH/OEMS&T.

V. REGIONAL TRAUMA ADVISORY COUNCIL

The RTAC will be established by the STAC for the purpose of operation of the Trauma Plan and to fulfill the legislature and rules requirements of a statewide trauma system. This is done under the authority of the ADPH/OEMS&T with action plans developed and presented as recommendations to the ADPH/OEMS&T.

RTAC appointments will occur in the following manner:

The Regional shall have a minimum 11 members. The membership shall be appointed in the same manner as the STAC is appointed and shall be composed of representatives of the same groups.

1. Four representatives of hospitals, who shall be appointed by the Board of Trustees of the Alabama Hospital Association. Two of the appointees shall be from hospitals located in urban areas and two shall be from hospitals located in rural areas of the region. At least two of the appointees shall be from hospitals that are currently trauma centers in the current system.
2. Four representatives who shall be licensed physicians appointed by the Medical Association of the State of Alabama.
3. One representative of the board who shall be the Medical Director of the Region or his/her designee.
4. One member who shall be a licensed emergency medical technician from the region who shall be appointed by the State Health Officer.
5. The State Health Officer or his designee.
6. Additional members may be appointed pursuant to rules promulgated by the State Board of Health. The additional members to be appointed by the STAC are as follows:
 - A. A representative of each hospital in the region except for the four hospital representatives already appointed in #2 above. This will be a total of thirteen additional hospital representatives.
 - B. Thirteen representatives who shall be licensed physicians within the region.
 - C. Two representatives who shall be licensed emergency medical technicians from the region. One shall be from a ground transport service and one from a helicopter transport service.
7. The chair of the RTAC shall be elected by the members to serve for four years.
8. All members of the RTAC shall be appointed for a term of four years, except initial members shall be appointed to terms from one to four years and shall

serve such staggered terms so that members appointed by the Alabama Hospital Association and Medical Association of the State of Alabama may be appointed subsequently each year. Vacancies shall be filled in the manner provided for the original appointments. Persons appointed to fill vacancies shall serve the un-expired portions of the terms.

9. The RTAC shall meet at least twice a year, but may meet more frequently upon the call of the Chair. The RTAC may meet by electronic means and shall establish rules of procedure for its meetings.
10. The RTAC may appoint subcommittees and workgroups. Subcommittees shall consist of council members and workgroups may consist of non-council members.
11. All other governance requirements of the regional trauma advisory councils shall be established by rule of the board.
12. Members shall serve without compensation, but shall be entitled to reimbursement for expenses incurred in the performance of their duties at the same rates as state employees.
13. The members shall represent the demographic composition of the state to the extent possible.
14. The duties of the RTAC are those assigned by this plan and by ADPH/OEMS&T rules, requests or contracts.

TRAUMA SYSTEM FUNCTION

General function of the system will follow the scenario of:

1. Injury occurs
2. Field evaluation done by EMS provider who determines if the patient meets the system criteria (if EMS provider is unsure of entry criteria that information may be immediately obtained from the ATCC).
3. Communication is established with the ATCC with brief basic information provided to the ATCC about all trauma patients to be transported to a trauma center.
4. Secondary triage (categorization of severity status, either physiologic, specific injury or mechanism) is made by the field EMS provider (with ATCC assistance as necessary) on patients entered into the Trauma System.

5. The secondary triage status and the current Trauma Center activity status (from the Emergency Resources Display) determine trauma center destination.
6. A direct patched communications link to the closest active trauma center is provided by the ATCC to the field EMS provider, **if requested** or at the discretion of the ATCC communicator.
7. Medical direction is established with the receiving Trauma Center by the communications link, if needed. Orders are provided as needed.
8. Prehospital care is completed and transport to the destination Trauma Center is initiated.
9. If a patient who meets criteria established by STAC and ADPH/OEMS&T arrives by EMS or private vehicle at a trauma center or non-trauma center, the hospital agent should notify the ATCC and enroll the patient in the trauma system, even if the hospital does not plan to transfer the patient.
10. The ATCC will, if requested, arrange inter-facility transfers of any patient needing services not available at the receiving hospital or trauma center to a higher level trauma center with the needed service line resources currently available.

Specific functions relative to the Trauma System are described in the following sections.

I. SYSTEM ENTRY CRITERIA

Patients are to be entered into the Trauma System following a trauma incident based on the following criteria:

A. **Physiological criteria:**

1. A systolic BP < 90 mm/Hg in an adult or < 80 mm/Hg in a child five or younger.
2. Respiratory distress - rate < 10 or >29 in adults, **or < 20 or > 40 in a child one year or younger.**
3. Head trauma with Glasgow Coma Scale score of 13 or less.

B. **Anatomical Criteria:**

1. The patient has a flail chest.
2. The patient has two or more obvious proximal long bone fractures (humerus, femur).

3. The patient has a penetrating injury of the head, neck, torso, or groin, associated with an energy transfer.
4. The patient has in the same body area a combination of trauma and burns (partial and full thickness) of fifteen percent or greater.
5. The patient has an amputation proximal to the wrist or ankle.
6. The patient has one or more limbs which are paralyzed.
7. The patient has a pelvic fracture, as evidenced by a positive “pelvic movement” exam.

C. Mechanism of the patient injury:

1. A patient with the same method of restraint and in the same seating area as a dead victim.
2. Ejection of the patient from an enclosed vehicle.
3. Motorcycle/bicycle/ATV crash with the patient being thrown at least ten feet from the motorcycle/bicycle.
4. Auto versus pedestrian with significant impact with the patient thrown, or run over by a vehicle.
5. An unbroken fall of twenty feet or more onto a hard surface.

D. EMS Provider Discretion:

1. If, the EMS provider is convinced the patient could have a severe injury which is not yet obvious, the patient should be entered into the trauma system.
2. The EMS providers suspicion of severity of trauma/injury may be raised by the following factors:
 - a. Age > 55 years of age
 - b. Age < five years of age**
 - c. Environment (hot/cold)
 - d. Patient’s previous medical history
 1. Insulin dependent diabetes

2. Cardiac condition
 3. Immunodeficiency disorder
 4. Bleeding disorder
 5. COPD/Emphysema
- e. Pregnancy
 - f. Extrication time > 20 minutes with heavy tools utilized
 - g. Motorcycle crash
 - h. Head trauma with history of more than momentary loss of consciousness.

Entering A Patient Into The Trauma System:

A. Call the Alabama Trauma Communications Center (ATCC) to determine patient destination:

ATCC contact numbers:

Toll-Free Emergency: 1-800-359-0123, or
Southern LINC EMS Fleet 55: Talkgroup 10/Private 55*380, or
Nextel: 154*132431*4

After assessing a trauma situation and making the determination the patient should be entered into the Trauma System, the EMS provider licensed at the highest level (**Note: the initial responding EMS provider should enter the patient into the system but the transporting service has the absolute responsibility to be sure the patient has been entered into the trauma system**) should contact the ATCC at the earliest time that is practical, and provide the following:

1. Identify yourself and your agency by name, unit number and county. If on-line medical direction is necessary, the receiving trauma center becomes medical direction. The ATCC will help coordinate on-line medical direction with a physician immediately.
2. Give your geographic location.
3. Give age and sex of patient (**patient name is not necessary**).
4. Assign patient number if more than one patient.
5. Give criteria for entry into Trauma System.

6. Give vital signs: Airway, respiratory rate and pulse oximeter reading, blood pressure, and GCS.
7. The ATCC Communicator will offer available trauma centers based on the information given above.
8. Give unit number of transporting unit, mode of transport, and time of transport from the scene.
9. **You will be given a unique identification number that must be entered into the chart when you generate your e-PCR.** The CQI process ADPH/OEMS&T will use this to identify the charts for quality improvement studies. **(Note to the transporting service: if the patient does not has a TCC number, he/she has not been entered into the trauma system)**

Notify the ATCC of any change in the patient's condition. The receiving trauma center (or ATCC, who can relay to trauma center) should be updated by the transporting unit 5-10 minutes out of the destination trauma center. This update need only consist of any patient changes. A repeat of information used to enter the patient into the Trauma System is not necessary since this information will be relayed by the ATCC to the receiving trauma center.

After the patient is delivered to the trauma center, the transporting provider should call the ATCC with the Patient Care Report times.

II. COMMUNICATIONS

Maintenance of adequate and prompt communications are essential to function of the Trauma System. In many instances trauma survival or maximum outcome potential can only be achieved with efficient and rapid movement of the patient through the system of Prehospital assessment and treatment, transport, and hospital resuscitation, evaluation and definitive care. Communication throughout the system is vital to this activity occurring in a most efficient and complete manner. Knowledge of the system-wide prehospital trauma activities and the current (and possibly changing) status of the functional capabilities of the various trauma center in the system is important at all times as it is possible multiple trauma activities are occurring simultaneously. This function also is essential for maximum mass casualty incident/disaster response. Communications allow differential system resource utilization when there are multiple trauma activities ongoing simultaneously and also allow maximum response preparation by receiving Trauma Centers. The key to system function is full knowledge of ongoing activities in all parts of the system at all times and centralized coordination of patient destination by the ATCC.

ATCC will note the closest trauma center for the EMS provider and the database.

It is essential to establish radio communications as soon as possible in patients meeting system entry criteria to provide a baseline level of the patient's status. After determination that a patient meets system entry criteria, the highest level EMS provider should contact

the ATCC at the earliest practical time to enter the patient into the system. The reporting EMS provider should identify himself/herself and provide the following information:

1. Basic patient data - number of victims, age, and sex
2. Injury mechanism data
3. Major anatomic injuries
4. Current primary survey status - airway, breathing, circulation, level of consciousness, and vital signs
5. Incident location
6. Estimated scene departure time
7. Proposed mode of transport, if ground, state transporting unit number

If radio failure should occur, direct contact between the EMS unit and their dispatch should be established with relay of information to the ATCC by telephone.

III. SYSTEM OPERATIONS

System operations refers to the activities that occur once it is determined a patient meets system entry criteria and communications have been established within the system. These activities include performance of secondary triage, trauma center destination determination, continuing communication, provision of field care, patient transport, and Trauma Center management.

1. Secondary Triage (use of system protocols to determine Trauma Center destination).

Secondary triage involves a determination of the severity status once a decision has already been made that a patient is to be entered into the system (primary triage). Secondary triage is used in conjunction with estimated transport time and current trauma center activity status to determine Trauma Center destination. The ATCC coordinates the application of the approved secondary triage protocols utilizing the patient assessment and transport time estimate by the field EMS provider combined with the current Trauma Center activity status as noted on the resource display to determine the trauma center destination. Secondary triage is based on physiologic status, mechanism of injury, and anatomic criteria, plus the potential use of EMS provider discretion and evaluation of co-morbid factors. Secondary triage standards are:

A. Physiologic entry criteria

- 1) Physiologic entry criteria take precedence over other criteria, except GCS, even if patients also meet mechanism and/or anatomic criteria.
- 2) Any patient entered into the system meeting physiologic criteria is to be transported to a level I trauma center if the transport time is under 60 minutes. If the level I trauma center is yellow because of no trauma surgeon (backup surgeon green), the patient should still be taken there unless a closer level II trauma center is within 20 minutes transport time. If the level I trauma center is yellow due to Neurosurgical services or CT is red, then transport the patient to the closest level II trauma center or level III trauma center enrolled in the stroke system with green neurosurgical services and CT.
- 3) Any patient who is entered under the altered CNS status physiologic criteria with a $GCS \leq 9$ is to be transported to a level I trauma center if transport time ≤ 60 minutes. If the patient is $GCS > 9$, then the patient is to be transported to a level II or III. If transport time is > 60 minutes, then to the closest level II or III.
- 4) In the following situations, the patient should be transported IMMEDIATELY to the closest hospital with full-time emergency physician coverage (Trauma Center preferably) as coordinated by the ATCC:
 1. The EMS provider is unable to effectively manage the airway or ventilate the unstable patient.
 2. The EMS provider is unable to stop the bleeding of a patient with severe hemorrhage.
 3. The EMS provider is unable to establish/maintain an IV to provide volume resuscitation in an unstable hypovolemic patient.

B. Anatomic Criteria - for patients with stable vital signs (for unstable patients see A. Physiologic Entry Criteria above):

- 1) Flail Chest
 - a. Closest level I if < 60 minutes total transport time
 - b. Closest level II or III if > 60 min total transport time to level I
- 2) Long bone fracture
 - a. Closest level I if < 60 minutes total transport time

- b. Closest level II or III if >60 min total transport time to level I
- 3) Penetrating head injury:
(Intracranial penetration thought present)
 - a. Level I as long as patient remains stable
- 4) Combination of burn and trauma
 - a. Closest level I
- 5) Amputation (amputated part recovered and not mangled)
 - a. Closest level I with Implant Service if <60 minutes transport
 - b. Closest level II or III if >60 minutes total transport time to level I
- 6) Amputation (amputated part not recovered or is mangled)
 - a. Closest level I if < 60 minutes transport
 - b. Closest level II or III if >60 minutes transport
- 7) Paralyzed limb(s)
 - a. Closest level I if <60 minutes total transport time
 - b. Closest level II or III if >60 min total transport time to level I
- 8) Pelvic fracture
 - a. Closest level I if <60 minutes total transport time
 - b. Closest level II or III if >60 min total transport time to level I
- C. Mechanism of injury criteria - for stable patients (for unstable patients see A. Physiologic Entry Criteria above):
 - 1) Death in same passenger area
 - a. Closest level I if <60 minutes total transport time

- b. Closest level II or III if >60 min total transport time to level I
- 2) Ejection
 - a. Closest level I if <60 minutes total transport time
 - b. Closest level II or III if >60 min total transport time to level I
- 3) Motorcycle/bicycle
 - a. Closest level I, II, or III
- 4) Auto versus pedestrian
 - a. Closest level I, II, or III
- 5) Fall
 - a. Closest level I if <60 minutes total transport time
 - b. Closest level II or III if >60 min total transport time to level I

D. EMS provider Discretion

If a patient has been entered into the system and does not meet specific secondary triage criteria or the EMS provider has a specific reason to upgrade the triage decision, the EMS provider may do so and transport the patient to the closest Level I, II, or III Trauma Center if there is less than 60 minutes transport time. The EMS provider is to specifically note on the e-PCR the reason for utilization of this discretion process. The EMS provider is to specifically inform the ATCC at the time the decision is made using the EMS provider discretion criteria.

E. Co-Morbid Factors

Any patient entered into the Trauma System who is stable but has any of the following factors may have a change in protocol based destination as listed below. Unstable patients follow the unstable physiologic criteria (see A above). No change indicates no change from standard secondary triage protocol.

- 1. Age greater than 55.....no change

2. Age less than 16 years old
 - a. Pediatric Level I trauma center if transport <60 minutes
 - b. Closest Level I, II, or III trauma center if >60 minutes transport time to Pediatric Center
3. Environmental extremes.....no change
4. Previous medical disease history.....no change
5. Pregnancy
 - a. Level I trauma center if <60 minutes total transport time
 - b. Level II trauma center or level III trauma center if >60 minutes total transport time to Level I
6. Extrication times >20 minutes.....no change
7. Motorcycle crash.....no change

NOTES:

- A. Transport time is the time which the field EMS provider estimates considering the mode of transport, weather, traffic, and other variables and incorporates the time from scene departure to trauma center arrival.
- B. Transport mode (ground versus air) will be determined by the field EMS provider. Medical Direction may wish to modify the transport mode.
- C. Based on prehospital trauma activity, transport needs and resource availability the ATCC will assist in coordination of patient destinations plus ground and air transport between the on site EMS providers, Trauma Centers, and the helicopter service.
- D. Should a trauma center destination be changed from the original destination chosen at the time of ATCC contact, a CQI will be initiated. A quarterly report of all of these issues will be made to the RTAC.

2. Trauma Center Destination

Trauma center destination will be determined by secondary triage evaluation and the current activity status of Trauma Centers in the system at the time the injury occurs. The trauma center status is tracked by the Emergency Resources display at the ATCC. That equipment is described in the component section and details the status of individual resources in the Trauma Center and therefore, the activity

status of the Trauma Center. Trauma centers will usually be either at a green (available), yellow (conditional), or a red (unavailable) status.

Green status means the trauma center has all service line resources available and may receive trauma victims based on location and secondary triage criteria at that time. Green status requirements involve the following.

1. All levels of trauma centers must have the following resources (which are on the Emergency Resources display grid) active and available at that time as pertains to their Trauma Center Level:

Emergency department (if Level I ED-T), anesthesia, operating room, X-ray, ICU, and orthopedic surgery (orthopedic surgery not required for Level III).

2. For Level I trauma centers the neurosurgical services and CT must be actively available.
3. The primary call trauma surgeon must be actively available at that time for all levels of trauma center.
4. If a trauma center has a secondary surgeon call schedule (backup surgeon), the lack of the primary trauma surgeon will only change the trauma center to "yellow."

Red status indicates at least some primary trauma care service line resources in that Trauma Center are not actively available and the trauma center is not to receive trauma victims at that time. Red status criteria are:

1. If any of the following resources are unavailable: emergency department (T if Level I), anesthesia, operating room, X-ray, ICU, and orthopedic Surgery (Level I).
2. Trauma surgeon is unavailable and there is no secondary surgeon backup call schedule or secondary surgeon is also unavailable.
3. Patients with neurologic injuries will not be triaged to a Level I center with no neurosurgical services or a CT Scanner actively available at that time (NS or CT red status).

Yellow status can occur under certain circumstances. Yellow status means at that moment some service line resources are not available and patients should be triaged to that trauma center only under certain specific conditions. Criteria for yellow status include:

1. A level I trauma center that does not have neurosurgical services or a CT available.

2. A trauma center with a secondary surgeon backup call schedule may be at yellow status if the primary trauma surgeon is unavailable, but the secondary backup surgeon backup is available. A trauma center that does not have a secondary backup surgeon call schedule cannot be at a yellow status based on trauma surgeon availability.

The green, yellow, and red status for combinations of Trauma Surgeon and secondary surgeon are summarized in the following table:

<u>Trauma Surgeon</u>	<u>2nd Call Surgeon</u>	<u>Trauma Center Status</u>
G	G	G
G	R	G
R	G	Y
R	R	R

TRAUMA CENTER DESTINATION NOTES

- A. Trauma center destination for patients entered into the system will be the closest appropriate trauma center based on secondary triage and Trauma Center availability.
- B. When a trauma center is on yellow status for the trauma surgeon/secondary backup surgeon status, trauma patients are directed to that TraumaCenter only when equivalent facilities are unavailable or beyond the routine 60 minute transport time, or there are multiple casualties requiring care at that level.
- C. A yellow status due to the unavailability of neurosurgical services or a CT scanner at a Level I facility means patients with neurologic trauma are to be transported to another facility.
- D. No trauma center should receive more than one unstable patient at one time if there are other level I trauma centers on green status within a reasonable transport time.
- E. In the event a patient or family member requests transport to a specific hospital that does not meet system guidelines, efforts will be made to clarify and encourage the advantage of using the Trauma System and a specific request to follow the established Trauma System plan will be made of the family. **The patient's or family members' wishes will, however, ultimately prevail.**
- F. If an event occurs where there are multiple patients meeting Trauma System entry criteria, the patient who is most critically injured (yet potentially salvageable) should go to the nearest appropriate green trauma center based on secondary triage criteria. The other patients should go to appropriate green and yellow Trauma Centers as coordinated through the ATCC.

- G. In the following situations the patient should be transported IMMEDIATELY to the closest hospital with full time emergency physician coverage (Trauma Center preferably) as coordinated by the ATCC.
1. The EMS provider is unable to effectively manage the airway or ventilate the unstable patient.
 2. The EMS provider is unable to stop the bleeding of a patient with severe hemorrhage.
 3. The EMS provider is unable to establish/maintain an IV to provide volume resuscitation in an unstable hypovolemic patient.
- H. In a situation where ATCC notification has occurred and no medical direction is needed, the ATCC will notify the receiving trauma center of the patient transport and provide information of condition, mechanism of injury, estimated arrival time, etc.
- I. If the patient meets physiologic criteria and the appropriate level Trauma Center determined by protocol based destination is not available, the patient should be transported to nearest currently active ("green") trauma center.
- J. If the patient is stable and the Trauma Center per the secondary triage destination protocol is not available, the patient may be taken to the nearest actively available ("green") trauma center.
- K. If, in the attending trauma surgeon's judgment, a level one trauma center is nearing capacity, the surgeon may place the level one trauma center on trauma system overload. The level one trauma center will appear yellow on the Trauma Center resource screen. The level one trauma center will remain available for trauma patients entered into the system under physiologic criteria, (except GCS >9) but patients entered under any other criteria will be routed as if the level one trauma center is unavailable. Patients routed in this manner will be reported to the RTAC and to ADPH/OEMS&T.

3. Prehospital System Activities

Prehospital care will be carried out following the guidelines of the Regional Medical Control Plan. The state prehospital care protocols will be used for primary guidance in prehospital trauma management. Patients entered into the Trauma System will receive their medical direction from the receiving Trauma Center, which will be immediately accessible through the communications link between the ATCC and that destination Trauma Center per regional secondary triage protocols, and the activity status of the Trauma Centers in the system at that time. Any significant patient condition changes are to be communicated directly to ATCC and the receiving Trauma Center as those changes may result in updating the orders and altering the destination Trauma Center Trauma Team activation. Field time should be kept to a relative minimum as trauma patients may be in a state of temporary compensated physiologic response at which time they appear stable, but may rapidly advance into an uncompensated and unstable

status at any time resulting in a significant threat to life. Frequently trauma resuscitation maneuvers can only be carried out in a Trauma Center Emergency Department or in an operating room. Therefore, "free field time" (time following extrication during which the EMS providers are free to either stay in the field to perform additional evaluations and management procedures or they are free to initiate transport to the destination Trauma Center) should be kept to a minimum. Initiation of transport should occur within 10 minutes following extrication completion in cases of major trauma.

4. Trauma Center System Activities

Trauma center management is an essential part of any Trauma System. This phase of trauma care requires adequate resources (equipment and facilities) and personnel with adequate training and commitment to carry out rapid initial assessment, stabilization, and definitive care including surgery plus critical care and recuperative care as necessary. In addition, rehabilitation services must be initiated as appropriate. Resources necessary to provide care are documented through the Trauma Center standards while patient care management protocols as described in the American College of Surgeons Advanced Trauma Life Support course are considered the standard of care for emergency department resuscitation.

IV. SYSTEM COMPLIANCE EVALUATION AND ACTION

This Trauma System is designed to provide specialized care to patients with actual or a significant probability of serious or critical injury. The system is based on hospital requirements to participate as a Trauma Center and follow system function protocols. Compliance with the requirements and protocols is essential for proper trauma victim management. Therefore, a specific program for monitoring compliance with requirements and with function protocols will be a part of the Trauma System. This program will be a function of the RTAC. Reports regarding compliance issues will be made to the ADPH/OEMS&T. Maintenance of compliance with requirements, standards, and system function protocol activities for individual personnel and agencies involved in the Trauma System means:

A. Maintaining component and organization standards as established by the plan.

1. Prehospital

Prehospital entities have the responsibility to assure their individual EMS providers have a basic knowledge and awareness of the Trauma System including entry criteria and basic operations.

2. Hospital Component
 - a) Continue to meet all Trauma Center Resource requirements for their level Trauma Center inclusive of trauma registry requirements.
 - b) Maintain a designated general/trauma surgeon as the trauma program leader with written responsibilities as indicated in the Regional Trauma System Plan.
3. Communications Component - Each entity is responsible for maintaining communications equipment used in the Trauma System in proper working order.
4. Data/CQI Component
 - a) Each entity is responsible for maintaining and providing data to the Trauma System as indicated in the Regional Trauma System Plan. For prehospital EMS services this means providing data to the ATCC which is then placed in the Alabama Trauma System Database. For Trauma Centers this means maintaining and providing the Trauma Center based information in the Alabama Trauma Registry dataset.
 - b) Participating entities need to maintain their individual Trauma CQI Programs as specified in the Regional Trauma System Plan. They are to provide reports of these activities to the RTAC on a timely basis as required.
 - c) Active continuing participation in the Regional Trauma CQI program is expected (all individual personnel from participating organizations must attend at least 75% of the Regional CQI meetings). Individual entities are to support the regional focused review of individual topics by providing data and participating in the evaluation process. Information (dataset, trauma death audit, etc.) is to be provided as required in a timely manner to ADPH/OEMS&T through the Trauma Center's trauma registry involvement.
5. Personnel from prehospital and Trauma Center organizations are to participate in RTAC activities per membership responsibilities. It is expected there will be 75% attendance of meetings by members.

B. Maintaining system function as noted in the Regional Trauma System Plan.

1. System entry criteria as specifically defined in the plan and by ADPH/OEMS&T or currently active protocols are to be used by EMS providers to determine patient entry into the Trauma System.
2. Communications as outlined in the plan and currently approved ADPH/OEMS&T protocols are to be initiated and maintained by EMS units. This involves initiating communications, providing information and participating in the use of the system operations protocols along with the ATCC for coordination of prehospital trauma care activities including patient entry into the system, determination of Trauma Center destination, and in conjunction with Medical Direction orders for provision of care using the ADPH/OEMS&T MDAC approved prehospital care protocols.
3. System operations are provided by individual entities as per the Regional Trauma System plan including currently approved ADPH/OEMS&T protocols. This includes the use of secondary triage protocols to determine trauma center destination, accurate maintenance of trauma care resource status by trauma centers participating in the Trauma System, and adherence to other system prehospital and trauma center activity protocols.

Failure of compliance with contract performance criteria or requirements, standards, or adherence to system function protocols as stated in the most current version of the written Regional Trauma System Plan will result in specific actions to be taken by the RTAC. Questions of compliance will be generated by system oversight review by the RTAC. Issues regarding a question of compliance when brought to the attention of RTAC may be directed to the ADPH/OEMS&T for evaluation. The RTAC will evaluate questions of compliance and if a compliance infraction has occurred a report will be forwarded to the ADPH/OEMS&T.

C. The prehospital component requirements, standards, and system function protocols are part of the Regional Medical Control Plan and deviation from that plan may result in the following actions by the ADPH/OEMS&T.

1. First breach of activity standards will result in a call and letter of explanation to the prehospital service indicating there has been a breach of activity standards with an explanation of the situation and an indication of the need for corrective action to be taken. There will be a one month time period for implementation of the corrective action.
2. The second breach of the same activity (or failure to respond to the first breach) will result in another letter to the prehospital service with a copy to ADPH/OEMS&T indicating that a second breach has occurred and again allowing a one month period for corrective action.

3. A third breach of the same activity will result in a letter to the State EMS Office for investigation and action. The office of EMS&T will send a report of findings and action to the RTAC.
- D. Trauma center participation in the system is governed by the contract between ADPH/OEMS&T and each Trauma Center. Deviations from requirements, standards or system function protocols governed by the contract may result in the following actions by the OEMS&T upon the advice of the RTAC:
1. The first breach of an activity standard will result in a call and/or letter of explanation indicating there has been a breach of an activity standard with an explanation and an indication that there is a need for corrective action. A one month period for corrective action implementation will be allowed.
 2. If a second breach of the same activity occurs a letter to the responsible entity indicating that a second breach has occurred with a warning that a third breach in that activity standard will result in suspension from the Trauma System for a 30 day period of time. A one month period for corrective action implementation will occur.
 3. A third breach of the same activity will result in contract failure and suspension of that facility from the Trauma System for a period of 30 days as per decision of the RTAC with the suspension time doubled for subsequent deviations of the same standard.

It will be the duty of the ADPH/OEMS&T to carry out these predetermined actions in cases of violation of requirements, standards, or failure of adherence to system function protocols.

SUMMARY

An organized system of care to improve trauma survival and outcome is a vital part of an overall healthcare plan. A region-wide Trauma System based on voluntary participation has been in operation since 1996. An adequate degree of overall regional support is necessary for this or any Trauma System to be able to function in a continuing manner.

This version of the Regional Trauma plan, when approved, will bring the BREMSS Regional Trauma plan and the BREMSS Medical Direction and Accountability Plan into compliance with all existing legislative and ADPH/OEMS&T rules and requirements.

APPENDIX A

Alabama Trauma Center Designation

Trauma Facilities Criteria: APPENDIX A Trauma Rules

The following table shows levels of categorization and their essential (E) or desirable (D) criteria necessary for designation as a Trauma Facility by the Alabama Department of Public Health

	Level I	Level II	Level III
INSTITUTIONAL ORGANIZATION			
Trauma Program	E	E	E
Trauma Service	E	E	-
Trauma Team	E	E	E
Trauma Program Medical Director	E	E	D
Trauma Multidisciplinary Committee	E	E	D
Trauma Coordinator/ TPM	E	E	E
HOSPITAL DEPARTMENTS/ DIVISIONS/ SECTIONS			
Surgery	E	E	-
Neurological Surgery	E	-	-
Neurological trauma liaison	E	-	-
Orthopedic Surgery	E	E	-
Orthopedic trauma liaison	E	E	-
Emergency medicine	E	E	-
Anesthesia	E	E	-
CLINICAL CAPABILITIES			
Published on-call schedule	E	E	E
General Surgery (attending surgeon promptly available ¹ 24 hours/day)	E	E	D
Published back-up schedule or written back-up method ²	E	D	-
Dedicated to single hospital when on-call	E	D	-
Anesthesia (promptly available ³ 24 hours/day)	E	E	D
Emergency Medicine (Immediately available in-house 24 hours/day)	E	E	E
On-call and promptly available 24 hours/ day . . .			
Cardiac surgery	E	-	-
Hand surgery (does not include micro vascular/re-implantation)	E	D	-
Micro vascular/replant surgery	D	-	-

	Level I	Level II	Level III
Neurologic Surgery	E	D	-
Dedicated to one hospital or back-up call	E	D	-
Obstetrics/gynecologic surgery ⁴	E	D	-
Ophthalmic surgery	E	D	-
Oral/maxillofacial surgery	E	D	-
Orthopedic	E	E	D
Dedicated to one hospital or back-up call	E	D	-
Plastic surgery	E	D	D
Critical care medicine	E	D	-
Radiology	E	E	D
Thoracic surgery	E	D	-
CLINICAL QUALIFICATIONS			
General/ trauma surgeon			
Current board certification	E	E	-
Average of 6 hours of trauma related CME/year ⁵	E	D	D
ATLS completion	E	E	E
Peer review committee attendance > 50%	E	E	-
Multidisciplinary committee attendance	E	E	-
Emergency Medicine			
Board certification ⁶	E	D	D
ATLS completion ⁷	E	E	E
Average of 6 hours of trauma related CME/year ⁵	E	D	-
Peer review committee attendance > 50%	E	E	-
Multidisciplinary committee attendance	E	E	-
Neurosurgery			
Current board certification	E	-	-
Average of 6 hours of trauma related CME/year ⁵	E	D	D
ATLS completion	D	D	D
Peer review committee attendance > 50%	E	E	-
Multidisciplinary committee attendance	E	E	-
Orthopedic surgery			
Board certification	E	D	-
Average of 6 hours of trauma related CME/year ⁵	E	D	D
ATLS Completion	D	D	D

	Level I	Level II	Level III
Peer review committee attendance > 50%	E	E	D
Multidisciplinary committee attendance	E	E	-
FACILITIES/ RESOURCES/ CAPABILITIES			
Volume Performance			
Trauma admissions 750/ year	E	-	-
Presence of surgeon at resuscitation	E	E	D
Presence of surgeon at operative procedures	E	E	E
Emergency Department (ED)			
Personnel - designated physician director	E	E	D
Equipment for resuscitation for patients of all ages			
Airway control and ventilation equipment	E	E	E
Pulse oximetry	E	E	E
Suction devices	E	E	E
Electrocardiograph-oscilloscope-defibrillator	E	E	E
Internal paddles	E	E	-
CVP monitoring equipment	E	E	D
Standard IV fluids and administration sets	E	E	E
Large-bore intravenous catheters	E	E	E
Sterile surgical sets for:			
Airway control/ cricothyrotomy	E	E	E
Thoracostomy	E	E	E
Venous cutdown	E	E	E
Central line insertion	E	E	-
Thoracotomy	E	E	-
Peritoneal lavage	E	E	D
Arterial catheters	E	D	D
Ultrasound	D	D	D
Drugs necessary for emergency care	E	E	E
X-ray available 24 hours/ day	E	E	D
Cervical traction devices	E	E	D
Broselow tape	E	E	E
Thermal control equipment:			
For patient	E	E	E
For fluids and blood	E	E	D

	Level I	Level II	Level III
Rapid infuser system	E	E	D
Qualitative end-tidal CO ₂ determination	E	E	E
Communications with EMS vehicles	E	E	E
OPERATING ROOM			
Immediately available 24 hrs/day ⁷	E	D	D
Operating Room Personnel			
In house 24 hrs/ day ⁸	E	-	-
Available 24 hrs/ day		E	E
Age Specific Equipment			
Cardiopulmonary bypass	E	-	-
Operating microscope	D	D	-
Thermal Control Equipment			
For patient	E	E	E
For fluids and blood	E	E	E
X-ray capability, including c-arm image intensifier	E	E	E
Endoscopes, bronchoscopes	E	E	D
Craniotomy instruments	E	D	-
Equipment for long bone and pelvic fixation	E	E	D
Rapid infuser system	E	E	D
Post Anesthetic Recovery Room (SICU is acceptable)			
Registered nurses available 24 hours/day	E	E	-
Equipment for monitoring and resuscitation	E	E	E
Intracranial pressure monitoring equipment	E	D	-
Pulse oximetry	E	E	E
Thermal control	E	E	E
Intensive or Critical Care Unit for Injured Patients			
Registered nurses with trauma education	E	E	-
Designated surgical director or surgical co-director	E	E	D
Surgical ICU service physician in-house 24 hours/day Emergency physician will satisfy this requirement	E	D	-
Surgically directed and staffed ICU service	E	D	-
Equipment for monitoring and resuscitation	E	E	-
Intracranial monitoring equipment	E	-	-
Pulmonary artery monitoring equipment	E	E	-

	Level I	Level II	Level III
Respiratory Therapy Services			
Available in-house 24 hours/day	E	E	D
On-call 24hrs/day	-	-	D
Radiological services (available 24 hours/day)			
In house radiology technologist	E	E	D
Angiography	E	D	-
Sonography	E	E	D
Computer Tomography (CT)	E	E	D
In house CT technician	E	-	-
Magnetic Resonance Imaging (Technician not required in house)	E	D	-
Clinical laboratory services (Available 24hours/day)			
Standard analyses of blood, urine, and other body fluids, including microsampling when appropriate			
Blood typing and cross-matching	E	E	E
Coagulation studies	E	E	E
Comprehensive blood bank or access to a community central blood bank and adequate storage facilities	E	E	E
Blood gasses and pH determinations	E	E	
Microbiology	E	E	E
Acute Hemodialysis	E	E	E
In-house (staff not required in-house 24 hours)	E	-	-
Transfer agreement (written document not required)	--	E	E
Burn Care – Organized			
In house or transfer agreement with Burn Center (See above)	E	E	E
Acute Spinal Cord Management			
In-house or transfer agreement with Regional Acute Spinal Cord Injury Rehabilitation Center (See above)	E	E	E
REHABILITATION SERVICES			
Transfer agreement to an approved rehabilitation facility (See above)	E	E	E
Physical therapy	E	E	D
Occupational therapy	E	D	D
Speech therapy	E	D	-
Social Service	E	E	D

	Level I	Level II	Level III
PERFORMANCE IMPROVEMENT			
Performance improvement programs	E	E	E
Trauma registry			
In house	E	E	D
Participate in state, local or regional registry	E	E	E
Orthopedic database	D	-	-
Audit of all trauma deaths	E	E	E
Morbidity and mortality review	E	E	E
Trauma conference-multidisciplinary	E	E	D
Medical nursing audit	E	E	E
Review of pre-hospital trauma care	E	E	D
Review of times and reasons of trauma-related bypass	E	E	E
Review of times and reasons for transfer of injured patients	E	E	E
Performance improvement personnel dedicated to care of injured patients	E	D	D
CONTINUING EDUCATION/OUTREACH			
General Surgery residency program	D	-	-
ATLS provide/ participate	E	D	D
Programs provided by hospital for:			
Staff/community physicians (CME)	E	E	D
Nurses	E	E	D
Allied health personnel	E	E	-
Pre-hospital personnel provision/ participation	E	E	D
PREVENTION			
Collaboration with other institutions for injury control and prevention	E	D	D
Designated prevention coordinator-spokesman for injury control	E	D	-
Outreach activities	E	D	D
Information resources for public	E	D	-
Collaboration with existing national, regional and state programs	E	D	-
Coordination and/or participation in community prevention activities	E	E	D

	Level I	Level II	Level III
RESEARCH			
Trauma registry performance improvement activities	E	E	E
Research committee	D	-	-
Identifiable IRB process	D	-	-
Extramural educational presentations	D	D	-
Number of scientific publications	D	-	-

¹ In both Level I and Level II facilities 24-hour in-house availability is the most direct method for the attending surgeon to provide care. In hospitals with residency programs, a team of physicians and surgeons that can include the Emergency Department Physicians, Surgical Residents, or Trauma Residents may start evaluation and treatment allowing the attending surgeon to take call outside the hospital if he/she can arrive. For hospitals without residency programs, the attending surgeon may take call from outside the hospital but should be promptly available. Compliance with these requirements must be monitored by the hospital's quality improvement program.

² If there is no published back-up call schedule there must be a written procedure of how to identify or locate another surgeon when needed and this should be monitored by the quality improvement plan.

³ Timeliness of anesthesia response should be monitored by the hospital's quality improvement program.

⁴ AL licensed specialty pediatric facilities, which are PPS exempt under Title 42 USC Section 1395ww(d)(1)(B)(iii) and receive funding under Title 42 USC 256e shall not be required to have an obstetric/gynecologic surgery service but should have a transfer agreement for OB-GYN surgery services.

⁵ An average of 18 hours of trauma CME every three years is acceptable.

⁶ Physicians may be board certified in Emergency Medicine or Pediatric Emergency Medicine by an ABMS- or AOA-recognized board, or may be board certified in a primary care specialty if they have extensive experience in management of trauma patients.

⁷ Physicians not board certified in Emergency Medicine or Pediatric Emergency Medicine by an ABMS- or AOA-recognized board must maintain their ATLS certification. There will be a three year grace period for emergency department staff to become compliant with this requirement

⁸An operating room must be adequately staffed and immediately available in a Level I trauma center. This is met by having a complete operating room team in the hospital at all times, so if an injured patient requires operative care, the patient can receive it in the most expeditious manner. These criteria cannot be met by individuals who are also dedicated to other functions within the institution. Their primary function must be the operating room.

An operating room must be adequately staffed and available when needed in timely fashion in a Level II trauma center. The need to have an in-house OR team will depend on a number of things, including patient population served, ability to share responsibility for OR coverage with other hospital staff, prehospital communication, and the size of the community served by the institution. If an out-of-house OR team is used, then this aspect of care must be monitored by the performance improvement program.

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APPENDIX B

TRAUMA COI DATA SET

1. Identification number - provided by the ATCC upon initial contact by prehospital provider. The same number would follow the patient through the system.

2. Location of the incident - City, County - possibly information from a city map grid (needs further investigation).

3. Prehospital unit(s) responding

4. Times
 - a. Prehospital
 - 1) incident
 - 2) unit dispatch
 - 3) unit scene arrived
 - 4) extrication ended (if applicable)
 - 5) unit scene departure
 - 6) unit hospital arrival
 - b. Communication
 - 1) initial contact with ATCC
 - 2) ATCC contact/link to receiving Trauma Center
 - 3) additional contacts to ATCC by EMS providers

5. Receiving trauma center

6. System entry data:
 - a. primary entry triage criteria
 - b. secondary entry criteria, if present

- c. co-morbid criteria
 - d. EMS provider discretion - Narrative field for why
 - e. patient age
 - f. patient sex
 - g. GCS*
 - h. scene vital signs*
(*ATCC will compute Trauma Score from this data)
7. Prehospital outcome:
- a. loss of vital signs and time
 - 1) lived
 - 2) expired (time)
8. Trauma center readiness:
- a. trauma score
 - b. physician arrival time in E.D.
 - 1) ED attending
 - 2) General/trauma surgeon
 - 3) Neurosurgeon
 - 4) Orthopedist
 - 5) Other: state _____
9. Procedures done within the first 24 hours (includes all procedures performed by initial receiving Trauma Center or receiving hospital if patient is transferred)
10. Disposition
- a. Emergency Department disposition
 - 1) disposition time - patient goes to initial hospital care location (not just leaves ED - i.e. to CT)

- 2) disposition location
 - a) discharged
 - b) admitted - ICU, OR, Ward
 - c) transferred - higher level Trauma Center
 - equal level Trauma Center
 - lower level Trauma Center
 - reason _____
 - d) expired

b. Final trauma center disposition/date/location

- 1) home
- 2) to rehabilitation center
- 3) to another acute care facility
- 4) to extended care facility
- 5) expired

APPENDIX C

CONTINUOUS QUALITY IMPROVEMENT

- A. Quality improvement is a vital part of a Trauma System. It is used to document continuing proper function of the system and evaluation of that function to implement improvements in system function and trauma victim management. In a Trauma System patients have virtually no time to make specific choices regarding acute and critical medical care and therefore, the system itself has a moral responsibility to provide evaluation functions to assure that the highest level of care is being provided and that improvements are implemented whenever possible in a timely manner. All CQI activities are to be provided in compliance with and under the auspices of the ADPH/OEMS&T.
- B. Such a program is system wide. There is to be individual agency efforts on the part of all participating agencies. Every participating Trauma Center will be represented on the RTAC QI Workgroup and continuing participation of all the various entities involved in trauma care is mandatory.
- C. The appropriateness, quality, and quantity of all activities of the system must be continuously evaluated.
1. Medical Care
 2. Prehospital care
 3. System function (dispatch activities, scene time, triage process and destination, response level, etc.)
- D. Prehospital Inter-Hospital Care
1. Items evaluated
 - a. patient assessment
 - b. protocol adherence (when applicable)
 - c. procedures initiated/completed
 - d. on-scene time
 - e. medical control interaction
 - f. transport-mode (ground/air)
 - g. resource availability/needs match
 - h. arrival report

- i. record/documentation
- j. inter-facility care/transport
- 2. Process - primarily performed by EMS organizations
 - a. Each organization assigns QI person to oversee process
 - b. Standards established - regional/authorized
 - c. Determine audit filters
 - d. Collect data
 - e. Evaluate data
 - f. Determine QI issues present
 - g. Develop corrective action plan
 - 1) professional resolution
 - 2) administrative resolution
 - h. Re-evaluation to document results/effectiveness of corrective action plan
- E. Trauma Center Care QI inclusive of participation in the statewide trauma registry
 - 1. Medical care
 - a. Complications
 - b. Deaths
 - c. Outcome Review
 - 1) internal review
 - 2) external comparison
 - d. Process for medical care QI (performed by each institution)
 - 1) Establish written care standards
 - 2) Collect data

- a) trauma data elements
- b) complications or events lists
- 3) Data QI evaluation
 - a) establish audit filters (indicators)
 - b) determine presence of potential QI issues
 - c) primary review (permissible)
 - d) multi-disciplinary peer review of QI issue
- 4) Corrective action
 - a) professional resolution
 - b) administrative resolution
- 5) Re-assess for effectiveness of corrective action
- 6) Documentation essential utilizing QI tracking flow sheet

2. Trauma Center Function

- a. Trauma Center operations via audit filter review
 - 1) Continuous
 - 2) Intermittent
 - 3) Focused audit filter review
- b. Specific event evaluation when event problem noted by trauma team member
- c. Medical nursing audit
- d. Utilization review
- e. Tissue review
- f. Divert utilization review
- g. Process same as for Medical Care Review with the addition of some form or method for noting events that occur that need evaluation in order to improve Trauma Center functions.

F. Regional System Function

1. Primarily performed by Regional EMS staff QI individual
2. Evaluation of overall Regional System function
3. Process
 - a. Establish standard
 - b. Collect data
 - c. Evaluate data - determine audit filters
 - d. Devise plan of corrective action for QI issues
 - e. Re-evaluate to determine effectiveness of corrective action
 - f. participation on RTAC Trauma QI Workgroup

G. RTAC QI Workgroups (staffed by BREMSS)

1. Goals - review entire Regional Trauma Program
 - a. System administration/organization/activities
 - b. Prehospital care
 - c. Hospital care
2. Members
 - a. ADPH/OEMS&T
 - b. Regional EMS Off-Line Medical Director
 - c. Regional EMS Executive Director
 - d. Regional EMS Office QI Coordinator
 - e. Regional EMS Office Data Coordinator
 - f. Prehospital provider representation - the designated QI coordinator for each county, (from an EMS organization)

- g. Participating hospital representation
 - 1) Trauma Director
 - 2) QI Coordinator
 - h. Coroner
3. Process
- a. Brief report of QI activities from each participating county/EMS organization and hospital
 - b. General system information
 - c. Focused review of items of major concern/impact including selected cases
 - d. Develop consensus of issues that represent QI concerns
 - e. Develop action plan
 - f. Have re-evaluation process to determine effectiveness of action plan results
 - g. Complete documentation of all activities including any recommendations for change or action to the RTAC and the ADPH/OEMS&T.
4. Trauma Center Medical Care Review Workgroup
- a. Members
 - 1) Trauma Director from each participating Trauma Center
 - 2) Emergency Department Medical Director from each active Trauma Center
 - 3) Regional EMS Medical Director
 - 4) Coroner/Medical Examiner
 - 5) Trauma Coordinator from Level I Trauma Center as recorder
 - 6) The chairman of this workgroup will be the chairman of the RTAC.
 - b. Activities are to review the trauma medical care issues including specific death audit review and major complications review as determined by the

workgroup chairman. Other CQI issues will be reviewed as deemed appropriate.

- c. The process used will be the same process as outlined in the CQI Section of the Regional Trauma System Plan.
 - d. Reports of a summary nature will be made to the RTAC QI Workgroup. Individual physician medical care issues will initially only be reported to the trauma director of the facility providing care in that situation and be made by personal communication. In general, discussions at the Trauma Center Medical Care Review Workgroup meeting will fulfill this notification requirement. If a persistent individual problem trend occurs, this situation will be referred to the appropriate hospital QI Workgroup.
5. All members are expected to attend at least 75% of the Regional QI Workgroup meetings and the Trauma Center Medical Care Review Workgroup meetings.

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