Trauma System Consultation

State of Georgia

Atlanta, Georgia

January 4th-7th, 2009

American College of Surgeons

Committee on Trauma

A multidisciplinary working group prepared this document based on the consultation visit that took place on January 4-7, 2009 in Atlanta, Georgia and included the following members:

Team Leader:

Robert J. Winchell, MD, FACS
Associate Clinical Professor of Surgery
University of Vermont School of Medicine
Head, Division of Trauma and Burn Surgery
Maine Medical Center
Portland, Maine

Team:

Jane Ball, RN, DrPH
Technical Advisor TSC
American College of Surgeons
Director, National Resource Center (EMS-C & Trauma) – Retired
Washington, DC

MarySue Jones, RN, MS
Trauma System Coordinator
Delaware Office of Emergency Medical Services
Dover, DE

Douglas F. Kupas, MD, FACEP
Associate Chief Academic Officer
for Medical Student and Resident Affairs
Associate, Department of Emergency Medicine
Geisinger Health System
Danville, PA

Terry Mullins, MBA
Chief
Arizona Bureau of EMS and Trauma System
Phoenix, AZ

Nels D. Sanddal, REMT-B, PhD(c), MS
Technical Advisor TSC
American College of Surgeons
President, Critical Illness and Trauma Foundation
Bozeman, MT

Michael H. Thomason, MD, FACS
Medical Director, Ross Trauma Center
Associate Chairman, Department of General Surgery
Charlotte, NC

ACS Staff:

Holly Michaels
Program Coordinator
Trauma Systems Consultation
American College of Surgeons

TABLE OF CONTENTS

Executive Summary

American College of Surgeons
Trauma System Consultation Visit
Georgia Trauma Care Network Commission
January 4-7, 2009

Georgia is a large state with an estimated population of 9,363,941 persons in 2006, and the population growth since 2000 of 14.4% has exceeded the national average growth of 6.4%. The state has 57,906 square miles with an average of 141.4 persons per square mile. The state has a mix of highly urbanized areas and rural areas. An estimated 20% of the population is considered rural.

Among the 144 acute care hospitals in the state, 34 are Critical Access Hospitals. Georgia currently has 15 designated trauma centers: 4 level I, 9 level II, and 2 level IV. This network of trauma centers has little true trauma system integration, and the trauma centers were described as “islands of excellence in a sea of chaos.” This may help explain why only 10,000 of the estimated 32,000 major trauma cases annually are treated at designated trauma centers.

Injury is a significant public health problem for Georgians. Death rates in the state due to trauma are significantly higher than the national average. As of 2005, 62 deaths per 100,000 persons die due to trauma, compared to the national statistics of 58 deaths per 100,000. A total of 5,433 Georgians died due to trauma in 2005, and many of these deaths could potentially have been prevented by improved access to trauma care and improved injury prevention efforts.

Georgia has a statewide emergency medical services (EMS) system, and unlike the majority of states, all primary zone EMS providers are paid. The EMS system faces some significant challenges, most of which stem from a strong tradition of local control, at the level of the individual service chief. This results in a system with little central state authority to set standards, and hence there is little uniformity in trauma triage and destination protocols; and EMS services have limited ability to transport patients to distant trauma centers outside of their service area.

The trauma system faces many significant challenges including significant issues related to hospital and trauma center diversion, physician specialty coverage in some areas, and a looming manpower shortage in surgical leadership at the trauma centers. Funding and personnel support for the infrastructure of the trauma and EMS programs within the Department of Human Resources has been chronically insufficient and has resulted in long-standing resource depletion

and demoralization of personnel, leaving inadequate resources for necessary basic work. Remaining personnel for the trauma program struggle to address the significant tasks of trauma center designation and trauma registry support, with no staff or time for trauma system development and process improvement. Limited resources for analysis of trauma registry data hampers the ability of trauma centers to benchmark and evaluate performance. Stakeholders that have worked tirelessly for years are frustrated by the lack of progress in trauma system development and have stopped meeting as a group.

At the same time, Georgia is in a highly enviable position in that its Legislature and Governor have expressed a keen interest in and desire to improve the trauma system. Recurrent budgetary support for hospital participation in the state trauma registry has been in place for several years. A recent appropriation provided substantial one-time funding for stabilization of the trauma centers. A recently passed statute, § 31-11-102, established an independent commission for the trauma system with wide powers that has become the central focus for system development. The level of executive and legislative interest, and the level of system funding in Georgia far exceed that present in most states.

A strong vision and on-going leadership for the continued development of the trauma system in Georgia is a key issue that must be addressed. This new statute established a unique administrative structure, but provided no clear delineation of authority and powers between the trauma program in the Department of Human Resources and the newly formed Georgia Trauma Care Network Commission (GTCNC). The site visit team was unable to determine which organization has the authority as the “lead agency” to develop and monitor the trauma system, and it seems that the stakeholders are similarly unsure. One of the first necessary tasks is for the stakeholders and the legislature to clearly determine where “lead agency” authority should best be placed, either with the GTCNC or the trauma program within the state administrative structure. There are potential benefits and specific weaknesses associated with either approach, and the best option is not immediately apparent. What is clear is the need for an unambiguous lead agency, and for a strong and consistent vision that can drive system development. The long and short-term ramifications of this new organizational structure for trauma system development are unclear.

Advantages and Assets of the Georgia Trauma System

- Long history of strong commitment within Georgia’s trauma network, by stakeholders and acute care facilities.
- High level of public awareness and understanding about the need for a trauma system.
- High level of legislative and executive interest and involvement.
- Significant funding for

  - Trauma center support
  - Registry support at the trauma center level
- A well established state trauma program for hospital designation.
- Strong cooperation among hospitals.
- Good primary EMS coverage at the emergency medical technician (EMT) Intermediate level.
- Good working relationship between EMS and trauma.
- Existence of other significant health resources.

Challenges and Vulnerabilities of the Georgia Trauma System

- Lack of vision and structured planning at the system level.
- Historical legacy of local control and rural/urban distrust.
- Recent major changes in the leadership structure.
- Loss of broad-based stakeholder involvement.
- Budgetary challenges at state level that have resulted in chronic under-funding and under-staffing within the Office of EMS and Trauma.
  - Many vacancies exist in critical positions, and positions cannot be filled due to a hiring freeze.
  - Insufficient resources and personnel for essential work that protects the public's safety (e.g., unable to review whether EMS providers have met recertification requirements in a timely manner).
  - Deteriorating morale.
- Several trauma centers and their providers are over-stressed related to patient volume and the need for additional health care providers.
- Insufficient geographic coverage by trauma centers in some areas of the state.
- Non-uniform EMS protocols for triage and transport.
- Lack of incentive for acute care facilities and health care providers to participate in the trauma system.
- No organized process or guidelines for trauma system performance improvement, and no regional quality assurance/process improvement efforts.
- Poor coordination between the trauma and disaster programs.

- The trauma system has no integration across all phases of care (prevention, acute care, and rehabilitation).

Priority Recommendations Summary

This full report contains more than eighty recommendations. Of these, the site visit team identified the following twenty as the most critical for the Georgia trauma system's short and long-term success.

Statutory Authority and Administrative Rules

- **Recommend to the legislature that they enact broad enabling legislation that includes the following elements: assign a lead agency; define the lead agency's role in the development, regulation, and monitoring of the system; and allow for the development of rules, regulations, policy, and procedures**.
- **Define clearly in statute, rule, or policy the relationship between the Office of Emergency Medical Services and Trauma (OEMS/T) and the Georgia Trauma Care Network Commission (GTCNC), along with reporting and accountability mechanisms.**

System Leadership

- **Re-engage a broad range of stakeholders and empower them within statute or rule to provide input on trauma system policy development.**
- **Ensure that the system leadership delineates the vision for Georgia's trauma system, including the development and deployment of operational policy in support of this vision.**

Lead Agency and Human Resources Within the Lead Agency

- **Perform a strategic analysis to assess and determine the optimal lead agency structure and position within Georgia's state government. Considerations must include:**
    - **Authority to complete essential tasks**
    - **Assurance of sufficient resources (fiscal and human) that can be sustained**
    - **Ability to collaborate and integrate with other health care resources**

Trauma System Plan

- **Develop a comprehensive trauma system plan to facilitate the integration of all services and providers through a collaborative process involving all stakeholders and community partners.**
    - **Use the plan to guide the development of enabling legislation.**
    - **Use the plan to direct the allocation of resources.**
- **Identify roles for all hospitals and stakeholders in an inclusive trauma system (all resources participate) within the trauma system plan.**

System Integration

- **Establish multidisciplinary regional trauma advisory committees centered around designated level I or II trauma centers and their geographic catchment areas.**
    - **Include representatives from trauma centers, acute care facilities, and EMS services.**
    - **Ensure oversight from the lead agency.**
    - **Build upon existing EMS Regional Councils as appropriate, recognizing that there may be incongruence and overlap with regional boundaries.**

Financing

- **Identify a sustainable and protected revenue source for the essential administrative, personnel, and infrastructure costs for the trauma system's lead agency.**
- **Seek legislative changes to OCGA 31-11, Article 5 that continue the cost of readiness support to trauma centers and EMS, and clarify that the lead agency funding allotments must be payable before other funds are distributed.**
- **Link allocation of cost of readiness funding (for trauma centers, healthcare providers, EMS agencies, and acute care hospitals) to deliverables designed to support performance improvement in the areas of system management, access to care, patient safety and outcomes, and financial stability of the system and its components.**

Emergency Medical Services

- **Provide the Office of EMS and Trauma and the Regional EMS Offices with adequate staff to efficiently manage and ensure that EMS**

services and providers are appropriately educated, credentialed, licensed, certified, and monitored to ensure competent patient care.

- **Appoint a state EMS medical director who has medical oversight of the EMS system as that individual's primary focus.**
- **Ensure that each region has an established plan for back-up EMS coverage at the local level when the patient's condition requires primary transport to a distant trauma center or specialty care facility.**

Definitive Care

- **Define roles, responsibilities, and accountabilities for all acute care facilities in an inclusive system related to trauma care.**
- **Establish uniform, clearly defined designation criteria, including critical and non-critical criteria deficiencies for each trauma center level, modeled on current American College of Surgeons' guidelines.**
    - **Apply criteria consistently to all centers.**

System Coordination and Patient Flow

- **Establish state criteria for trauma center diversion with regional adoption of notification plans and time frames for diversion. Make diversion a reportable event tied to funding support and trauma center designation.**

Disaster Preparedness

- **Focus disaster training and preparedness initiatives on programs that can be integrated into daily and routine use.**

System Evaluation and Quality Assurance

- **Develop and implement statewide and regional trauma system performance improvement plans.**

Trauma Management Information Systems

- **Use the existing trauma registry data to develop simple benchmarking reports.**

Trauma System Assessment

Injury Epidemiology

Purpose and Rationale

Injury epidemiology is concerned with the evaluation of the frequency, rates, and pattern of injury events in a population. Injury pattern refers to the occurrence of injury-related events by time, place, and personal characteristics (for example, demographic factors such as age, race, and sex) and behavior and environmental exposures, and, thus, it provides a relatively simple form of risk-factor assessment.

The descriptive epidemiology of injury among the whole jurisdictional population (geographic area served) within a trauma system should be studied and reported. Injury epidemiology provides the data for public health action and becomes an important link between injury prevention and control and trauma system design and development. Within the trauma system, injury epidemiology has an integral role in describing the root causes of injury and identifying patterns of injury so that public health policy and programs can be implemented. Knowledge of a region's injury epidemiology enables the identification of priorities for directing better allocation of resources, the nature and distribution of injury prevention activities, financing of the system, and health policy initiatives.

The epidemiology of injury is obtained by analyzing data from multiple sources. These sources might include vital statistics, hospital administrative discharge databases, and data from emergency medical services (EMS), emergency departments (EDs), and trauma registries. Motor-vehicle crash data might also prove useful, as would data from the criminal justice system focusing on interpersonal conflict. It is important to assess the burden of injury across specific population groups (for example, children, elderly people and ethnic groups) to ensure that specific needs or risk factors are identified. It is critical to assess rates of injury appropriately and, thus, to identify the appropriate denominator (for example, admissions per 100,000 population). Without such a measure, it becomes difficult to provide valid comparisons across geographic regions and over time.

To establish injury policy and develop an injury prevention and control plan, the trauma system, in conjunction with the state or regional epidemiologist, should complete a risk assessment and gap analysis using all available data. These data allow for an assessment of the "injury health" of the population (community, state, or region) and will allow for the assessment of whether injury prevention programs are available, accessible, effective, and efficient.

An ongoing part of injury epidemiology is public health surveillance. In the case of injury surveillance, the trauma system provides routine and systematic data collection and, along with its partners in public health, uses the data to complete injury analysis, interpretation, and dissemination of the injury information. Public health officials and trauma leaders should use injury surveillance data to describe and monitor injury events and emerging injury trends in their jurisdictions; to identify emerging threats that will call for a reassessment of priorities and/or reallocation of resources; and to assist in the planning, implementation, and evaluation of public health interventions and programs.

OPTIMAL ELEMENTS

I. There is a thorough description of the epidemiology of injury in the system jurisdiction using population-based data and clinical databases. **(B-101)**

- There is a through description of the epidemiology of injury mortality in the system jurisdiction using population-based data. **(I-101.1)**

- There is a description of injuries within the trauma system jurisdiction, including the distribution by geographic area, high-risk populations (pediatric, elderly, distinct cultural/ethnic, rural, and others), incidence, prevalence, mechanism, manner, intent, mortality, contributing factors, determinants, morbidity, injury severity (including death), and patient distribution using any or all the following: vital statistics, ED data, EMS data, hospital discharge data, state police data (data from law enforcement agencies), medical examiner data, trauma registry, and other data sources. The description is updated at regular intervals. **(I-101.2)**
  Note: Injury severity should be determined through the consistent and system-wide application of one of the existing injury scoring methods, for example, Injury Severity Score (ISS).

- There is comparison of injury mortality using local, regional, statewide, and national data. **(I-101.3)**

- Collaboration exists among EMS, public health officials, and trauma system leaders to complete injury risk assessments. **(I-101.4)**

- The trauma system works with EMS and public health agencies to identify special at-risk populations. **(I-101.7)**

II. Collected data are used to evaluate system performance and to develop public policy. **(B-205)**

- Injury prevention programs use trauma management information system data to develop intervention strategies. **(I-205.4)**

III. The trauma, public health, and emergency preparedness systems are closely linked. **(B-208)**

a. The trauma system and the public health system have established linkages, including programs with an emphasis on population based public health surveillance and evaluation for acute and chronic traumatic injury and injury prevention. **(I-208.1)**

IV. The jurisdictional lead agency, in cooperation with the other agencies and organizations, uses analytic tools to monitor the performance of population based prevention and trauma care services. **(B-304)**

a. The lead agency, along with partner organizations, prepares annual reports on the status on injury prevention and trauma care in the state, regional, or local areas. **(I-304.1)**

b. The trauma system management information system database is available for routine public health surveillance. There is concurrent access to the databases (ED, trauma, prehospital, medical examiner, and public health epidemiology) for the purpose of routine surveillance and monitoring of health status that occurs regularly and is a shared responsibility. **(I-304.2)**

CURRENT STATUS

Georgia has a number of population-based datasets, including: vital records, hospital discharge data, emergency department data, motor vehicle crash data, workers compensation, and family violence. Additionally, they have access to the trauma registry and emergency medical services (EMS) data that are not yet population-based. Both types of data sets can be used to describe the problem of injury. It was reported that all hospitals are required to submit hospital discharge data. It is unclear if ICD9-CM External Cause of Injury Code (E-Code) is required although the state has published reports that include E-code derived data. A comprehensive profile of injury was printed in 1999 and updated in 2005. Several statistics from the 2005 report are available on the DHR Section of Injury Prevention's website. Extensive data about motor vehicle crash-related injury are available on the Governor's Office of Highway Safety (GOHS) website. Family violence and homicide data are available on the Georgia Bureau of Investigation website.

Epidemiologic support exists within the Office of Preparedness' Section of Injury Prevention. The trauma program has not fully explored the availability of this resource for trauma data analysis as the injury prevention program reportedly was only recently moved into the Office of Preparedness. It was additionally reported that the OEMS/T and Injury Prevention section offices, even though within the same oversight unit, are in different physical locations, further reducing opportunities for collaboration. Additional epidemiologic resources are available in the DHR Division of Public Health (vital records and other health information); however, no investigation of the availability of these epidemiologists to assist with injury and trauma data analysis was reported. The GOHS also has epidemiology

support for analysis of motor vehicle related injuries. The state, apparently, has the capacity to conduct probabilistic data linkages between databases with the Crash Outcome Data Evaluation System (CODES) program based in DHR, but the trauma program did not report any contact or attempt to use this expertise.

Some excellent epidemiologic resources exist in schools of public health, and in some cases epidemiology students are available for injury data analysis. For example, the child fatality review data are analyzed by an epidemiologist in the Emory Rollins School of Public Health. The epidemiologist identified an interest and willingness to assist the state with injury data analysis.

The trauma program has a historic profile, *Trauma in Georgia*, based on 2003 trauma registry data. It was reported that a more recent version of this document was not approved for publication by DHR because additional data analysis and explanations were needed. The state is encouraged to update and revise this publication and to integrate injury with trauma care data.

Injury surveillance is being conducted in the Injury Prevention Program and in other agencies; however, the trauma program is not engaged. Since the trauma data are not yet integrated into the injury surveillance process, it is not possible to establish benchmarks or to determine the effectiveness of the trauma centers as measured by reductions of injury mortality and morbidity.

Participants reported no recent effort to conduct a gap analysis of injury resources and programs; however, the *Profiles of Injuries in Georgia 2005* includes many resources to address specific injury mechanisms. An *Injury Strategic Plan for Georgia* and a *Framework for Child Injury Prevention Planning* have been produced.

RECOMMENDATIONS

- Develop a consensus on the definitions of injury for surveillance and injury control (e.g., all injuries, single system injuries, major trauma or multi-system injuries, special populations [pediatrics, geriatrics cultural groups], hospital admissions, and treated and released)
- Engage an epidemiologist to identify and select key data elements from existing population-based data collected by several state agencies, the trauma registry, and EMS databases; and then complete a comprehensive biennial statewide injury control report (e.g., mechanisms, age specific data, mortality, morbidity, costs, trends, and trauma care).
    - Create a template for the report, building upon or integrating the *Profiles in Injuries in Georgia* 2005 and *Trauma in Georgia* reports.

- Prepare, publish (electronic and print), and disseminate the report on a biennial basis.
- Use this report to support the evolution of the trauma system.

Indicators as a Tool for System Assessment

Purpose and Rationale

In the absence of validated national benchmarks, or norms, the benchmarks, indicators and scoring (BIS) process included in the Health Resources and Services Administration's *Model Trauma System Planning and Evaluation* document provides a tool for each trauma system to define its system-specific health status benchmarks and performance indicators and to use a variety of community health and public health interventions to improve the community's health status. The tool also addresses reducing the burden of injury as a community-wide public health problem, not strictly as a trauma patient care issue.

This BIS tool provides the instrument and process for a relatively objective state and substate (regional) trauma system self-assessment. The BIS process allows for the use of state, regional, and local data and assets to drive consensus responses to the BIS. It is essential that the BIS process be completed by a multidisciplinary stakeholder group, most often the equivalent of a state trauma advisory committee. The BIS process can help focus the discussion on various system strengths and weaknesses, can be used to set goals or benchmarks, and provides the opportunity to target often limited resources and energies to the areas identified as most critical during the consensus process. The BIS process is useful to develop a snapshot of any given system at a moment in time. However, its true usefulness is in repeated assessments that reveal progress toward achieving various benchmarks identified in the previous application of the BIS. This process further permits the trauma system to refine goals to be attained before future reassessments using the tool.

OPTIMAL ELEMENT

I. Assurance to constituents that services necessary to achieve agreed-on goals are provided by encouraging actions of others (public or private), requiring action through regulation, or providing services directly. **(B-300)**

CURRENT STATUS

When participants were queried about their familiarity with the Health Resources and Services Administration (HRSA) *Model Trauma System Planning and Evaluation* (MTSPE) document, the majority of participants indicated some awareness of the publication. When further asked about their knowledge of the

Benchmark, Indicator, and Scoring (BIS) section of the MTSPE fewer participants replied in the affirmative.

No specific plans to conduct a BIS assessment were described, although OEMS/T suggested that they would like to accomplish this task within the next twelve months. One of the challenges is that, with the dissolution of the Trauma System Development Committee (TSDC), no organized group of stakeholders is available to conduct the assessment.

During discussions about the potential value of the BIS, it was noted that the tool could be used to identify specific needs that should be addressed as the trauma system plan is being developed. Additionally, it was noted that it would provide a metric by which progress in trauma system development could be captured and reported to the legislature, as a basis for continued funding support.

RECOMMENDATIONS

- Complete a BIS assessment within the next twelve months using a multidisciplinary group of at least 20 stakeholders from the previous Trauma System Development Committee (TSDC).
    - Identify, by consensus, priority areas and activities for trauma system enhancement.
- Conduct repeated assessments using the BIS tool on a regularly scheduled basis, e.g. biennially, to measure progress toward the completion of priority objectives for trauma system development and as justification to the legislature for continued funding support.

Trauma System Policy Development

Statutory Authority and Administrative Rules

Purpose and Rationale

Reducing morbidity and mortality due to injury is the measure of success of a trauma system. A key element to this success is having the legal authority necessary to improve and enhance care of injured people through comprehensive legislation and through implementing regulations and administrative code, including the ability to regularly update laws, policies, procedures, and protocols. In the context of the trauma system, comprehensive legislation means the statutes, regulations, or administrative codes necessary to meet or exceed a predescribed set of standards of care. It also refers to the operating procedures necessary to continually improve the care of injured patients from injury prevention and control programs through postinjury rehabilitation. The ability to enforce laws and rules guides the care and treatment of injured patients throughout the continuum of care.

There must be sufficient legal authority to establish a lead trauma agency and to plan, develop, maintain, and evaluate the trauma system during all phases of care. In addition, it is essential that as the development of the trauma system progresses, included in the legislative mandate are provisions for collaboration, coordination, and integration with other entities also engaged in providing care, treatment, or surveillance activities related to injured people. A broad approach to policy development should include the building of system infrastructure that can ensure system oversight and future development, enforcement, and routine monitoring of system performance; the updating of laws, regulations or rules, and policies and procedures; and the establishment of best practices across all phases of intervention. The success of the system in reducing morbidity and mortality due to traumatic injury improves when all service providers and system participants consistently comply with the rules, have the ability to evaluate performance in a confidential manner, and work together to improve and enhance the trauma system through defined policies.

OPTIMAL ELEMENTS

I. Comprehensive state statutory authority and administrative rules support trauma system leaders and maintain trauma system infrastructure, planning, oversight, and future development. **(B-201)**

The legislative authority states that all the trauma system components, emergency medical services (EMS), injury control, incident management,

and planning documents work together for the effective implementation of the trauma system (infrastructure is in place). **(I-201.2)**

Administrative rules and regulations direct the development of operational policies and procedures at the state, regional, and local levels. **(I-201.3)**

II. The lead agency acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to the trauma system. **(B-311)**

a. Laws, rules, and regulations are routinely reviewed and revised to continually strengthen and improve the trauma system. **(I-311.4)**

CURRENT STATUS

The enabling legislation for the development of the trauma system was identified as Official Code of Georgia (OCGA) § 31-11. This section contains no readily visible broad authority to develop a trauma system. The most pertinent section is § 31-11-102 which defines the role of the Georgia Trauma Care Network Commission (GTCNC) and, secondarily, describes activities relegated to the DHR Office of EMS and Trauma (OEMS/T). The initial activities of the GTCNC have been focused on the distribution of funds to ensure adequate trauma center and emergency medical services (EMS) agency preparedness and partial recovery of uncompensated care. However, by year three of the GTCNC's existence they are also charged with additional activities. Among these are:

(8) To appropriate, out of the Georgia Trauma Trust Fund, annual moneys for investment in a system specifically for trauma transportation. The purpose of this system is to provide transport to trauma victims where current options are limited. The commission shall promulgate rules and regulations for such system and shall pursue contracts with existing state transportation structures or create a contractual arrangement with existing transportation organizations. The commission shall also be responsible for creating, maintaining, and overseeing a foundation to raise funds specifically for investment in this system and overall trauma funding...

(10) To coordinate its activities with the Department of Human Resources;

(11) To employ and manage staff and consultants in order to fulfill its duties and responsibilities under this article;

(12) To establish, maintain, and administer a trauma center network to coordinate the best use of existing trauma facilities in this state and to direct patients to the best available facility for treatment of traumatic injury;

(13) To coordinate, assist, establish, maintain, and administer programs designed to educate the citizens of this state on trauma prevention;

(14) To coordinate and assist in the collection of data to evaluate the provision of trauma care services in this state;

(15) To study the provision of trauma care services in this state to determine the best practices and methods of providing such services, to determine what changes are needed to improve the provision of trauma care services, and to report any proposed legislative changes to the General Assembly each year;…

While the GTCNC is given the authority to promulgate rules and regulations pertaining to a trauma transportation system, none of these activities, either individually or cumulatively, assigns to the GTCNC the responsibility or authority to develop a comprehensive, integrated and inclusive trauma system.

To further add confusion to the process, the relationship between the GTCNC and the DHR Office of EMS and Trauma (OEMS/T) is not clearly stated, although limited duties of the OEMS/T are defined as:

9) To act as the accountability mechanism for the entire Georgia trauma system, primarily overseeing the flow of funds from the Georgia Trauma Trust Fund into the system. The State Office of EMS/Trauma shall receive an annual distribution from the commission of not more than 3 percent of the total annual distribution from the fund in the fiscal year. These funds shall be used for the administration of an adequate system for monitoring statewide trauma care, recruitment of trauma care service providers into the network as needed, and for research as needed to continue to operate and improve the system;

The OCGA is supported, in theory, by the rules and by Georgia Department of Human Resources Rules and Regulations Chapter 290-05-30.05 and 290-05-30.06

290-5-30-.05 Regional EMS Council.

(1) Purpose. The board shall have the authority on behalf of the state to designate a public or nonprofit local entity to… make recommendations for the designation of trauma centers and to serve in an advisory capacity to the department and to perform other duties as directed by the department…

(2) Duties of the Regional EMS Council shall include:…

(d) Recommend to the Board or its designee the designation and redesignation of Trauma Centers as specified in department policy and in these Rules…

290-5-30-.06 Designation of Trauma Centers.

(1) Applicability.
  (a) This section shall not prevent any hospital or medical facility from providing medical care to any trauma patient.
  (b) No hospital or medical facility shall hold itself out or advertise to be a designated trauma center without first meeting the requirements of these rules.

(2) Designation.
  (a) The OEMS shall define in policy the process for trauma center designation and redesignation.
  (b) The OEMS has the authority to review, enforce and recommend removal of trauma center designation for trauma centers failing to comply with applicable statutes, rules and regulations and department policy.
  (c) Designation will be for a period of three (3) years.
  (d) Each designated trauma center will be subject to periodic review.

The origin of these rules dates back to the early 1970's. At that time, the theoretical framework for trauma care centered exclusively around the designation of a limited number of trauma centers that would be responsible for the receipt and treatment of "trauma patients". This framework created an exclusive trauma system, or perhaps more specifically, a trauma center network. This theoretical framework does not embrace the more modern understanding of an inclusive trauma system within a public health framework. The exclusive model of trauma care provides limited ability to account for the less seriously injured patients (the majority of trauma patients) who can, and should, be treated at local acute care facilities. In the inclusive model of trauma care, all acute care facilities that have emergency departments play some role in the treatment of injured patients. The national evolution in trauma system development is not reflected in the current statutory language that focuses primarily on trauma centers.

Broad enabling legislation that clearly directs either the GTCNC or the OEMS/T to develop a trauma system plan, to serve as a guideline for trauma system development and evaluation over time, is absent from the current statute or regulations. Likewise, the assignment of a lead agency for trauma system development is not clearly evident.

When queried about statutes that protect either systemwide performance improvement processes or state level trauma registry data, participants were uncertain about the level of protection from discoverability that exists, if any.

When asked directly if the OEMS/T would release trauma registry data in the event of a subpoena request, the answer was affirmative.

The OEMS/T reports a consistent approach to the trauma center designation process, but allows some flexibility in requirements related to less critical criteria Exceptions, variations, and waivers related to these less critical criteria were reported by OEMS/T and the current trauma centers. It is unclear whether these variances are applied on a consistent basis or on an ad hoc basis. The OEMS/T also reported some variance in contracts regarding the capture and submission of trauma registry data. If the data are received by OEMS/T, but an effort is being made to resolve technical issues regarding submitted data, the invoice is paid. If the trauma center has not submitted the data, no funds are paid.

EMS standards are, likewise, not uniformly applied in accordance with rule or policy. For instance, it was noted that emergency medical personnel scheduled to recertify more than a year ago have not been formally re-credentialed due to a backlog in records, exacerbated by a personnel shortage within the OEMS/T. This delay in credentialing has occurred even with the acknowledgement that a known proportion of recertification applications have, historically, contained falsified information.

It was noted by participants that recent challenges have identified a flaw in the emergency medical services (EMS) statute. Unlike requirements that identify responsibility for assuring fire and law enforcement protection, no unit of government – state, region, county or municipality – is charged with assuring that each community has appropriate EMS resources. In at least one municipality this resulted in a significant reduction of funding to local EMS agencies when one unit of government abdicated their responsibility for the provision of service, suggesting that the responsibility rested with another unit of government.

Neither the OEMS/T nor the GTCNC has any processes for the ongoing review, revision, and refinement of statute, rule, regulation, policy or procedure. This challenge may be magnified by the dissolution of the TSDC which had been a representative and multidisciplinary body for the provision of input into the OEMS/T.

Given the extraordinary interest currently expressed by State government leadership, it is an opportune time to re-institute a formal, multidisciplinary stakeholder community and task them with a gap analysis of current OEMS/T statutes. This could be used to begin the process of obtaining the necessary legislative authority to clearly establish a lead agency and to implement the full scope of initiatives necessary for an inclusive trauma system, including the review of and protection from discovery or subpoena of the trauma and EMS data containing protected health care information.

RECOMMENDATIONS

- **Recommend to the legislature that they enact broad enabling legislation that includes the following elements: assign a lead agency; define the lead agency's role in the development, regulation, and monitoring of the system; and allow for the development of rules, regulations, policy, and procedures**.
- **Define clearly in statute, rule, or policy the relationship between the Office of Emergency Medical Services and Trauma (OEMS/T) and the Georgia Trauma Care Network Commission (GTCNC), along with reporting and accountability mechanisms.**
- Conduct an analysis of the current OEMS/T legislative authority for the trauma program, and use appropriate governmental resources, (e.g., the Office of the Attorney General) to identify legislative needs.
- Ensure that the EMS and trauma system data and system performance improvement processes are fully protected from discoverability.

System Leadership

Purpose and Rationale

In addition to lead agency staff and consultants (for example, trauma system medical director), there are other significant leadership roles essential to developing mature trauma systems. A broad constituency of trauma leaders includes trauma center medical directors and nurse coordinators, prehospital personnel, injury prevention advocates, and others. This broad group of trauma leaders works with the lead agency to inform and educate others about the trauma system, implements trauma prevention programs, and assists in trauma system evaluation and research to ensure that the right patient, right hospital, and right time goals are met. There is a strong role for the trauma system leadership in conveying trauma system messages, building communication pathways, building coalitions, and collaborating with relevant individuals and groups. The marketing communication component of trauma system development and maintenance begins with a consensus-built public information and education plan. The plan should emphasize the need for close collaboration between coalitions and constituency groups and increased public awareness of trauma as a disease. The plan should be part of the ongoing and regular assessment of the trauma system and be updated as frequently as necessary to meet the changing environment of the trauma system.

When there are challenges to providing the optimal care to trauma patients within the system, the leadership needs to effect change to produce the desired results. Broad system improvements require the ability to identify challenges and the resources and authority to make changes to improve system performance. However, system evaluation is a shared responsibility. Although the leadership will have a key role in the acquisition and analysis of system performance data, the multidisciplinary trauma oversight committee will share the responsibility of interpreting those data from a broad systems perspective to help determine the efficiency and effectiveness of the system in meeting its stated performance goals and benchmarks. All stakeholders have the responsibility of identifying opportunities for system improvement and bringing them to the attention of the multidisciplinary committee or the lead agency. Often, subtle changes in system performance are noticed by clinical care providers long before they become apparent through more formal evaluation processes.

Perhaps the biggest challenge facing the lead agency is to synergize the diversity, complexity, and uniqueness of individuals and organizations into a finely tuned system for prevention of injury and for the provision of quality care for injured patients. To meet this challenge, leaders in all phases of trauma care must demonstrate a strong desire to work together to improve care provided to injured victims.

OPTIMAL ELEMENTS

I. Trauma system leaders (lead agency, trauma center personnel, and other stakeholders) use a process to establish, maintain, and constantly evaluate and improve a comprehensive trauma system in cooperation with medical, professional, governmental, and other citizen organizations. **(B-202)**

II. Collected data are used to evaluate system performance and to develop public policy. **(B-205)**

III. Trauma system leaders, including a trauma-specific statewide multidisciplinary, multiagency advisory committee, regularly review system performance reports. **(B-206)**

IV. The lead agency informs and educates state, regional, and local, constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control. **(B-207)**

CURRENT STATUS

The state of Georgia has been working to improve trauma care since the early 1980's, beginning with the designation of trauma centers. The primary focus of system development has centered on trauma center designation and the state trauma registry. A multidisciplinary Trauma Systems Development Committee (TSDC) with a broad representation of stakeholders was formed in 2002, and tasked with developing a draft plan for the Georgia trauma system. This effort was in response to the requirements of a Health Resources and Services Administration (HRSA) trauma systems development grant. Unfortunately, the plan was never approved by the DHR, and thus, it has not served its important function of guiding trauma system development.

Along with the development of the draft trauma plan, the TSDC began a very successful campaign to raise public and legislative awareness of the importance of trauma care. The public awareness campaign has led to an exceptional level of public support and legislative interest. The TSDC and the OEMS/T was also able to secure annual funding ($750,000) for hospital participation in a state trauma registry.

Despite the obvious commitment of the trauma system leaders, both through the TSDC and individual trauma centers, the plan for the development of an integrated regional system was never implemented. The participants noted many barriers, including a strong Georgia tradition for local control, a long-standing distrust between rural and urban regions, a challenging bureaucracy, chronic under-funding of EMS services, chronic under-funding of the OEMS/T, and shortages of qualified or willing providers in many disciplines.

The OEMS/T in the Office of Preparedness of the Division of Public Health has a relatively low profile within the DHR. Participants reported that little attention is paid to EMS and trauma programs, and they expressed frustration with bureaucratic barriers related to policy and trauma system development. Some discussion was heard by participants that the Department of Community Health might potentially be a better home for the programs.

In response to growing public awareness, a joint study commission of the Georgia legislature was formed to address the problem of trauma care. The result of the study commission's work was the passage of Senate Bill 60 in 2007 (OCGA 31-11, § 31-11-102) that created the GTCNC. This commission was tasked with the management of funds intended to support trauma care, and with the planning and development of a comprehensive trauma care network. The companion bills intended to identify an ongoing source of revenue for the trauma system (on a scale of $80 to $90 million) failed to pass. The GTCNC membership is specified in the OGCA, and it includes at least one physician, one hospital representative from a designated trauma center, and one representative from an EMS zone provider. All nine members are appointed, either by the Governor (5), the Lieutenant Governor (2) or the Speaker of the House (2).

The GTCNC was given broad authority both for distribution of funds and for implementation of system planning, with no defined agency or legislative oversight. With the creation of the GTCNC, the more broadly constituted TSDC no longer had a role, and it was reported that they had little interest in continuing to meet. In addition, funds were no longer available to support TSCD meetings. In its first year of operation, the GTCNC was given a one-time allocation of over $58 million which had to be distributed in the first 6 months of 2008. Much of the commission's energy was spent in the determining the allocation of these funds to hospitals, providers, and EMS for coverage of both readiness and of unfunded care costs, and then working with the OEMS/T to distribute the funds. The GTCNC's broader mission for development of the trauma care network had not yet been addressed at the time of the site visit.

Currently, the trauma system leadership, and at least some portion of the authority for its development, has been assigned to the newly formed GTCNC. However, this assignment appears to have occurred without clear planning for the infrastructure and reporting relationships necessary for the implementation of that mission. In addition, the broad-based stakeholder participation of the TSDC has been lost and replaced by a small, politically-appointed commission. The short and long term implications of this global change in leadership are not at all clear. Further, the GTCNC has no stated tenure, and its charter and powers are subject to legislative modification at any time. While this legislation created a process with significant potential advantages in efficiency and the ability to circumvent bureaucracy, the membership of the GTCNC is narrowly constituted without important and necessary stakeholder involvement, and it is subject to

modification by the Governor, Lt. Governor, and legislature. As constituted, the GTCNC may, or may not, be considered to be the lead agency, but it appears to lack the long term stability and broad representation necessary to function as the lead agency for trauma system development and implementation over the long term.

RECOMMENDATIONS

- **Re-engage a broad range of stakeholders and empower them within statute or rule to provide input on trauma system policy development.**

- **Ensure that the system leadership delineates the vision for Georgia's trauma system, including the development and deployment of operational policy in support of this vision.**

- Designate a clear lead agency for trauma system development and implementation that has permanence and the necessary reporting relationships to facilitate policy development, implementation, and daily operations.

    - Ensure a close linkage with the office of EMS.

- Restructure the operations of the Office of EMS and Trauma within state government to reduce the levels of approval needed so that the time interval from policy development to approval and implementation is reduced.

    - During the restructuring, consider changing the name of the Office of EMS and Trauma to the Office of Emergency Care, integrating EMS and trauma programs with other time-sensitive diseases (e.g., STEMI, stroke, asthma), potentially eliminating one layer of bureaucracy.

Coalition Building and Community Support

Purpose and Rationale

Coalition building is a continuous process of cultivating and maintaining relationships with constituents (interested citizens) in a state or region who agree to collaborate on injury control and trauma system development. Key constituents include health professionals, trauma center administrators, prehospital care providers, health insurers and payers, data experts, consumers and advocates, policy makers, and media representatives. The coalition of key constituents comprises the trauma system's stakeholders. The involvement of these key constituents is important for the following:

- Trauma system plan development
- Regionalization: promoting collaboration rather than competition between trauma centers
- System integration
- State policy development: authorizing legislation and regulations
- Financing initiatives
- Disaster preparedness

The coalition should be effectively organized through the formation of multidisciplinary state and regional advisory groups to coordinate trauma system planning and implementation efforts. Constituents also communicate with elected officials and policy leaders regarding the development and sustainability of the trauma system. Information and education are needed by constituents to be effective partners in policy development for trauma system planning. Regular communication about the status of the trauma system helps these key partners to recognize needs and progress made with trauma system implementation.

One of the most effective ways to educate elected officials and the public is through an organized public information and education effort that may involve a media campaign about the burden of injury in the state and the need for trauma system development. Information and education are important to reduce the incidence of injury in all age groups and to demonstrate the value of an effective trauma system when a serious injury occurs.

OPTIMAL ELEMENT

I. The lead agency informs and educates state, regional, and local constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control. **(B-207)**

CURRENT STATUS

The trauma coordinators from each of the trauma centers have been the most consistent and long-standing group of stakeholders contributing to trauma care in Georgia. They have sustained an ongoing interest and focus on trauma care for nearly thirty years. To their credit, they have formed a nonprofit group known as Trauma Associates of Georgia (TAG) that was initially supported by contributions from the individual trauma centers for the purpose of conducting an annual, statewide, multidisciplinary trauma conference. The TAG is currently planning its seventh trauma conference and is self-supporting from the trauma conference revenues. Another significant accomplishment is that in collaboration with the trauma registrars from the trauma centers, the trauma coordinators were able to achieve consensus on a standard data dictionary for the state trauma registry.

A multi-disciplinary group of stakeholders known as the Trauma System Development Committee (TSDC) also existed for many years. TSDC stakeholders were predominantly trauma center professionals or associated with various state organizations or EMS agencies. The TSDC was particularly active from 2001-2004 during the HRSA trauma development grant program. They achieved consensus on a trauma system plan that, unfortunately, was never formally adopted nor implemented. Stakeholders have also worked together effectively to establish a state trauma registry and to seek funding for the trauma care network.

The trauma system stakeholders expanded to develop a broader grassroots base through a sophisticated public education campaign. Participants identified the need to approach additional groups of individuals in this effort, such as insurance industry representatives and business leaders. A recent new group of stakeholders includes Georgia university students from the health profession schools (HealthSTAT) who became actively engaged in trauma care advocacy. These stakeholders have also been exceptionally successful in educating state legislators and the governor regarding the trauma system crisis.

The state and stakeholders are to be commended for the development of a public education campaign that promotes the need for improved access to trauma care and funding to support the trauma centers. When it became apparent that the public education campaign could not be disseminated through the DHR, the stakeholders created the Georgia Statewide Trauma Action Team (GSTAT) and successfully collaborated with the Georgia Hospital Association to launch the campaign. An opportunity remains to further expand the outreach of the campaign by developing resources for the Spanish-speaking community.

While the remarkable success of the stakeholders led to the development of the Georgia Trauma Care Network Commission (GTCNC) and some additional funding for the trauma system, the more formalized TSDC stakeholder group was discontinued. While many former TSCD stakeholders reported attending GTCNC meetings, stakeholders have lost many opportunities to make ongoing

contributions to trauma system development. The evolving trauma system (regardless of which agency is determined to be the lead agency) needs their professional expertise and advice to develop the rules and policies for the trauma system. Significant effort will be needed to re-engage the stakeholders to help determine the direction of the trauma system.

RECOMMENDATIONS

- Re-energize the stakeholders by creating opportunities for them to be more formally engaged in the development of the trauma system.
- Develop a process for proactive communication with ALL stakeholder groups.
- Continue the public education campaign and explore ways to expand its dissemination to state residents.
    - Explore opportunities to disseminate the information to Spanish-speaking residents.
- Identify and recruit new stakeholders to help promote system development, such as non-trauma hospitals, critical access hospitals, insurance representatives, business leaders, and consumers.

Lead Agency and Human Resources Within the Lead Agency

Purpose and Rationale

Each trauma system (state, regional, local, as defined in state statute) should have a lead agency with a strong program manager who is responsible for leading the trauma system. The lead agency, usually a government agency, should have the authority, responsibility, and resources to lead the planning, development, operations, and evaluation of the trauma system throughout the continuum of care. The lead agency, empowered through legislation, ensures system integrity and provides for program integration with other health care and community-based entities, namely, public health, EMS, disaster preparedness, emergency management, law enforcement, social services, and other community-based organizations.

The lead agency works through a variety of groups to accomplish the goals of trauma system planning, implementation, and evaluation. The ability to bring multidisciplinary, multiagency advisory groups together to accomplish trauma system goals is essential in developing and maintaining the trauma system and is part of providing leadership to evolving and mature systems.

The lead agency's trauma system program manager coordinates trauma system design, the adoption of minimum standards (prehospital and in-hospital), and provides for overall system evaluation through performance indicator assessment and assurance. In addition to a trauma program manager, the lead agency must be sufficiently staffed to actively participate in each phase of development and in maintaining the system through a clearly defined structure for decision making (policies and procedures) and through proactive surveillance and evaluation. *Minimum* staffing usually consists of a trauma system program manager, data entry and analysis personnel, and monitoring and compliance personnel. Additional staff resources include administrative support and a part-time commitment from the public health epidemiology service to provide system evaluation and research support.

Within the leadership and governance structure of the trauma system, there is a role for strong physician leadership. This role is usually fulfilled by a full- or part-time trauma medical director within the lead agency.

OPTIMAL ELEMENTS

I. Comprehensive state statutory authority and administrative rules support trauma system leaders and maintain trauma system infrastructure, planning, oversight, and future development. **(B-201)**

a. The legislative authority (statutes and regulations) plans, develops, implements, manages, and evaluates the trauma system and its component parts, including the identification of the lead agency and the designation of trauma facilities. **(I-201.1)**

b. The lead agency has adopted clearly defined trauma system standards (for example, facility standards, triage and transfer guidelines, and data collection standards) and has sufficient legal authority to ensure and enforce compliance. **(I-201.4)**.

II. Sufficient resources, including financial and infrastructure-related, support system planning, implementation, and maintenance. **(B-204)**

CURRENT STATUS

Georgia began its efforts to establish a trauma system more than 20 years ago. The Georgia Office of EMS/Trauma, functioning arguably as the lead authority, oversees the 15 designated trauma centers that treat more than 11,000 trauma patients annually.

Organizational Structure of the Office of Preparedness

The Office of Preparedness encompasses four important emergency care sections:

- EMS
- Trauma
- Emergency Preparedness
- Injury Prevention

The Office of Preparedness is located within the Division of Public Health of the Department of Human Resources (DHR).

Organizational Structure of the Trauma Program

The Trauma Program has 2 full time positions:

- The trauma manager is charged with all activities associated with the designation of trauma centers; coordination of relationships with the stakeholder community (internal and external); attendance at state and national meetings; conduit of policy information between stakeholder groups and the DHR.
- The trauma registrar is charged with managing and recording trauma data transfers from the 15 trauma centers; facilitating problem resolution with contributing trauma centers and the software vendor; performing compliance audits and basic quality assessments on facility data; performing ad-hoc reporting activities; and representing the OEMS/T on matters concerning the acquisition, use, and quality of state trauma registry data.

Ancillary Program Staffing

- The OEMS/T has 10 staff positions for the 10 regional councils that have some trauma program activities responsibilities. However, several regional staff positions are vacant.
- The Director of the Office of Preparedness also serves as the medical director for the trauma, EMS, and emergency preparedness programs, but has very limited time for the EMS and trauma medical director role.

Statutory Commissions

Georgia has no identified advisory or oversight boards or committees attached to the trauma program. One advisory committee, the TSDC, was established in 1999 and continued to meet as a requirement of the HRSA Trauma System Development Grant. This group has ceased to meet since the passage of SB 60 and the establishment of the GTCNC in 2008. Some members of the TSDC have continued to participate by attending public meetings of the GTCNC.

The 2007-2008 Legislature passed into law (O.C.G.A. 31-11, Article 5) establishing the GTCNC and charging it with a complex set of activities (see Statutory Authority section for a listing). The apparent overlapping mandates for trauma program and the GTCNC make it unclear as to which organization carries the “Lead Agency” banner for the State. Additionally, the GTCNC has no accountability to any state agency, but it is expected to collaborate with the OEMS/T.

Position Vacancies and Budgetary Actions

Georgia, like most states, is experiencing dramatic revenue shortfalls, resulting in a hiring freeze, and mandatory furloughs to reduce the salary component of the budget. The Office of Preparedness has many vacant positions:

- EMS: 8 out of 30 positions are vacant (27%) (Including the EMS director)
- Emergency Preparedness: 14 of 34 positions are vacant (41%)
- Injury Prevention: 4 of 10 positions are vacant (40%)

While numerous interactions with participants made it clear that the OEMS/T staff members are highly respected, a universal expression of frustration was heard regarding their inability to accomplish statutory responsibilities in a timely fashion. Maintenance and growth of the Georgia trauma system requires sufficient personnel, as well as administrative and infrastructure funding. The trauma manager needs to shift focus to facilitate the work of the stakeholders and the GTCNC for the development and implementation of rules, regulations, and policies for the trauma system. Continued progress on trauma system development requires additional personnel support including:

- A State EMS and Trauma Medical Director whose focus is on the oversight of the emergency medical and trauma system of the state. States have used a variety of models and methods to achieve this, including contracting with a currently practicing emergency physician for this position.

- A Trauma Designation Coordinator, responsible for all outreach, review and scheduling associated with designation process for new and existing trauma centers.
- A part-time epidemiologist responsible for the development of EMS and trauma-related analysis and benchmarking reports.
- A dedicated administrative assistant.

Trauma medical direction is essential for clinical oversight of the system. One model for this is the appointment of a trauma medical advisor who supports the EMS Medical Director for trauma-related protocol development, as implemented in North Carolina. In the absence of a state trauma medical director or advisor, trauma medical direction could potentially be provided through a technical advisory group composed of trauma center medical directors.

Finally, many of the roles and responsibilities of the regional EMS staff should include coordinating many activities associated with the establishment of regional trauma systems. Regional staff should receive training on performance improvement and trauma system development to support these activities, and they should meet regularly, in person, to discuss best practices with colleagues from other regions.

RECOMMENDATIONS

- **Perform a strategic analysis to assess and determine the optimal lead agency structure and position within Georgia's state government. Considerations must include:**
  - **Authority to complete essential tasks**
  - **Assurance of sufficient resources (fiscal and human) that can be sustained**
  - **Ability to collaborate and integrate with other health care resources**
- Increase the number of permanent positions within the trauma program to initially include:
  - Trauma medical director or advisor (part time) with a primary focus of medical oversight of the trauma program
  - Trauma program manager (full time)
  - Trauma registrar (full time)
  - Epidemiologist/ trauma data analyst (part time)
  - Trauma Center Designation Coordinator (full time)
  - Administrative support staff (full time)

- Ensure that regional OEMS/T staff are trained, engaged in, and supportive of regional trauma system development.
    - Convene regularly scheduled meetings of all regional EMS directors and state trauma leadership to discuss barriers and strategies for regional trauma system development

Trauma System Plan

Purpose and Rationale

Each trauma system, as defined in statute, should have a clearly articulated trauma system planning process resulting in a written trauma system plan. The plan should be built on a completed inventory of trauma system resources identifying gaps in services or resources and the location of assets. It should also include an assessment of population demographics, topography, or other access enhancements (location of hospital and prehospital resources) or barriers to access. It is important that the plan identify special populations (for example, pediatric, elderly, in need of burn care, ethnic groups, rural) within the geographic area served and address the needs of those populations within the planning process. A needs assessment (or other method of identifying injury patterns, patient care review/preventable death study) should also be completed for initial trauma system planning and updated periodically as needed to assess system changes over time.

The trauma system plan is developed by the lead trauma agency based on the results of a needs assessment and other data resources available for review. It describes the system design, integrated and inclusive, with adopted standards of care for prehospital and hospital personnel and a process to regularly review the plan over time. The plan is built on input from trauma advisory committees (or stakeholder groups) that assist in analyzing data, identifying resources, and developing system standards of care, including system policies and procedures and overall system design. Ideally, although every stakeholder group may not be satisfied with the plan or system design, the plan, to the extent possible, should be based on consensus of the advisory committees and stakeholder groups. These advisory groups should be able to review the plan before final adoption and approve the plan before it is submitted to the lead agency with authority for plan approval.

The trauma system plan is used to guide system development, implementation, and management. Each component of the trauma system (for example, prehospital, hospital, communications, and transportation) is clearly defined and an established service level identified (baseline) with goals for enhancement (benchmark). Within the plan are incorporated other planning documents used to ensure integration of similar services and build collaboration and cooperation with those services. Service plans for emergency preparedness, EMS, injury prevention and control, public health, social services, and mental health are examples of services for which the trauma system plan should include an interface between agencies and services.

OPTIMAL ELEMENT

I. The state lead agency has a comprehensive written trauma system plan based on national guidelines. The plan integrates the trauma system with EMS, public health, emergency preparedness, and incident management. The written trauma system plan is developed in collaboration with community partners and stakeholders. **(B-203)**

a. The trauma system plan clearly describes the system design (including the components necessary to have an integrated and inclusive trauma system) and is used to guide system implementation and management. For example, the plan includes references to regulatory standards and documents and includes methods of data collection and analysis. **(I-203.4)**

CURRENT STATUS

The Georgia Trauma System Development Committee (TSDC), a multidisciplinary group of 38 stakeholders established in 1999, developed a draft trauma system plan as a requirement of the HRSA Trauma System Development grant. The plan was updated in 2006, but it has never been approved by DHR. Limited staffing in OEMS/T hampered efforts to advocate for the plan's approval and, even if approved, the trauma program would have been severely limited in its ability to implement the plan as designed (see Lead Agency and Human Resources).

With the passage of Senate Bill 60, the GTCNC may now be charged with oversight of trauma system planning, but the process has not yet moved forward. The GTCNC's primary focus has thus far been the allocation of the one year funding for trauma center and provider readiness and uncompensated care costs. The GTCNC sought an American College of Surgeons (ACS) trauma system consultation, and the commission has retained a consulting firm, Bishop and Associates to assist with future trauma system development.

The current trauma system is, essentially, an exclusive network of trauma centers, with no policies to direct the care of trauma patients in the prehospital arena or within other acute care facilities. As described in the Statutory Authority section, an inclusive trauma system is the current national model. Enabling legislation which provides authority for development, implementation, and maintenance of a comprehensive, inclusive trauma system plan is lacking.

RECOMMENDATIONS

- **Develop a comprehensive trauma system plan to facilitate the integration of all services and providers through a collaborative process involving all stakeholders and community partners.**
    - **Use the plan to guide the development of enabling legislation.**
    - **Use the plan to direct the allocation of resources.**
- **Identify roles for all hospitals and stakeholders in an inclusive trauma system (all resources participate) within the trauma system plan.**

System Integration

Purpose and Rationale

Trauma system integration is essential for the daily care of injured people and includes such services as mental health, social services, child protective services, and public safety. The trauma system should use the public health approach to injury prevention to contribute to reducing the entire burden of injury in a state or region. This approach enables the trauma system to address primary, secondary, and tertiary injury prevention through closer integration with community health programs and mobilizing community partnerships. The partnerships also include mental health, social services, child protection, and public safety services. Collaboration with the public health community also provides access to health data that can be used for system assessment, development of public policy, and informing and educating the community.

Integration with EMS is essential because this system is linked with the emergency response and communication infrastructure and transports severely injured patients to trauma centers. Triage protocols should exist for treatment and patient delivery decisions. Regulations and procedures should exist for online and off -line medical direction. In the event of a disaster affecting local trauma centers, EMS would have a major role in evacuating patients from trauma centers to safety or to other facilities or to make beds available for patients in greater need.

The trauma system is a significant state and regional resource for the response to mass casualty incidents (MCIs). The trauma system and its trauma centers are essential for the rapid mobilization of resources during MCIs. Preplanning and integration of the trauma system with related systems (public health, EMS, and emergency preparedness) are critical for rapid mobilization when a disaster or MCI occurs. The extensive impact of disasters and MCIs on the functioning of trauma centers and the EMS and public health systems within the affected region or state must be considered, and joint planning for optimal use of all resources must occur to enable a coordinated response to an MCI. Trauma system leaders need to be actively involved in emergency management planning to ensure that trauma centers are integrated into the local, regional, and state disaster response plans.

OPTIMAL ELEMENTS

I. The state lead agency has a comprehensive written trauma system plan based on national guidelines. The plan integrates the trauma system with EMS, public health, emergency preparedness, and incident management. The written trauma

system plan is developed in collaboration with community partners and stakeholders. **(B-203)**

a. The trauma system plan has established clearly defined methods of integrating the trauma system plan with the EMS, emergency, and public health preparedness plans. **(I-203.7)**

II. The trauma, public health, and emergency preparedness systems are closely linked. **(B-208)**

CURRENT STATUS

The current Georgia trauma system functions primarily as a network of cooperating trauma centers, focused primarily on the provision of acute care. No significant integration of services covering the spectrum of care from injury prevention through rehabilitation exists. Similarly, no integration with other community health and safety programs beyond the level of individual centers was described. The 2006 draft of the trauma system plan addresses some of these components as necessary elements, but the plan does not describe action steps for implementation.

Integration with EMS services is incomplete and largely inefficient at the current time. Though the organizational chart places the EMS, Trauma, Injury Prevention and Emergency Preparedness programs within the same Office, on a practical level little interaction is apparent to the site visit team (SVT). The leadership and energy of this Office is heavily skewed toward Emergency Preparedness, with the director estimating that approximately 5% to 10% of his time is devoted to trauma, and 5% to 10% is devoted to EMS.

The structure of the EMS system places all major control at the local level, with the leadership of the individual EMS service. A regional structure exists, involving 10 regions, but these EMS regional councils are advisory only and have no authority to create or enforce policy. The EMS community is clearly committed to the optimal provision of trauma care. Model state EMS protocols are posted on the website and include the 2006 version of the National Trauma Triage Criteria from the ACS and CDC. No evidence was provided that these model protocols are widely adopted at the local level.

Reorganization of the EMS system into a more integrated regional system was reported by the participants to be impeded by several factors including the following: historical local biases and distrust of centralized authority, inadequate staffing of EMS regions, and inadequate funding leading to many vacancies in current state and regional positions. In addition, policy development at the level of the OEMS/T was reported to be impeded by a very unresponsive bureaucracy and indirect chain of command, along with insufficient staffing to complete routine operational tasks such as the following: EMS agency licensure, personnel

training and licensure, trauma registry maintenance, and trauma system monitoring.

Overall, rather than an integrated system, the various components of the network are focused upon their own tasks, working largely in isolation. Despite an understanding of the importance of system integration, the participants described feeling trapped by limited resources and historical attitudes, without the ability to move forward.

RECOMMENDATIONS

- **Establish multidisciplinary regional trauma advisory committees centered around designated level I or II trauma centers and their geographic catchment areas.**
  - **Include representatives from trauma centers, acute care facilities, and EMS services.**
  - **Ensure oversight from the lead agency.**
  - **Build upon existing EMS Regional Councils as appropriate, recognizing that there may be incongruence and overlap with regional boundaries.**
- Ensure that the trauma system plan integrates specific system components that include: injury prevention, rehabilitation services, mental health, community and public health services, and social services.
- Involve trauma centers, acute care facilities and regional EMS councils in the development of uniform regional triage guidelines, destination protocols, transfer protocols, and standards for medical direction that meet minimum state guidelines.
- Move the primary authority for the development and implementation of EMS policy and protocols from the local to the regional level with additional state lead agency oversight and approval.
- Establish regional mechanisms for data-driven review of
  - System performance improvements
  - Clinical process improvement
- Ensure coordination and integration with emergency preparedness and disaster response resources effectively utilizing the regional trauma network.

Financing

Purpose and Rationale

Trauma systems need sufficient funding to plan, implement, and evaluate a statewide or regional system of care. All components of the trauma system need funding, including prehospital, acute care facilities, rehabilitation, and prevention programs. Lead agency trauma system management requires adequate funding for daily operations and other important activities such as advisory committee meetings, development of regulations, data collection, performance improvement, and public awareness and education. Adequate funding to support the operation of trauma centers and their state of readiness to care for seriously injured patients within the state or region is essential. The financial health of the trauma system is essential for ensuring its integrity and its improvement over time.

The trauma system lead agency needs a process for assessing its own financial health, as well as that of the trauma system. A trauma system budget should be prepared, and costs should be reported by each component, if possible. Routine collection of financial data from all participating health care facilities is encouraged to fully identify the costs and revenues of the trauma system, including costs and revenues pertaining to patient care, administrative, and trauma center operations. When possible, the lead agency financial planning should integrate with the budgets and costs of the EMS system and disaster, rehabilitation, and prevention programs to enable development of a comprehensive financial health report.

Trauma system financial planning should be related to the trauma plan outcome measures (for example, patient outcome measures such as mortality rates, length of stay, and quality-of-life indicators). Such information may demonstrate the value added by having a trauma system in place.

OPTIMAL ELEMENTS

I. Sufficient resources, including financial and infrastructure-related, support system planning, implementation, and maintenance. **(B-204)**

a. Financial resources exist that support the planning, implementation, and ongoing management of the administrative and clinical care components of the trauma system. **(I 204.2)**

b. Designated funding for trauma system infrastructure support (lead agency) is legislatively appropriated. **(I-204.3)**

c. Operational budgets (system administration and operations, facilities administration and operations, and EMS administration and operations) are aligned with the trauma system plan and priorities. **(I-204.4)**

II. The financial aspects of the trauma systems are integrated into the overall performance improvement system to ensure ongoing fine tuning and cost-effectiveness. **(B-309)**

a. Collection and reimbursement data are submitted by each agency or institution on at least an annual basis. Common definitions exist for collection and reimbursement data and are submitted by each agency. **(I-309.2)**

CURRENT STATUS

The trauma program component of the OEMS/T operational funding (general fund) has been consistent for the past three funding cycles with modest increases consistent with cost-of-living changes. The budget for this past year was approximately $560,000 of which $465,000 was dedicated to personnel services, leaving $95,000 to accomplish programmatic activities. Continuing budget shortfalls has resulted in mandatory furloughs of state employees amounting to one or two days per month. Travel restrictions have in many cases reduced or eliminated staff travel to in-state and out-of state meetings, thereby limiting their availability for regional and local collaboration and oversight.

In April of 2008, the Legislature passed SB 60 (OCGA 31-11, Article 5), creating the GTCNC and allocated a one-time appropriation of more than $58 million to the Georgia Trauma Fund to offset a portion of uncompensated care costs, readiness costs, capital grants for level I and II trauma centers, level IV trauma center application costs, trauma center application costs, and an EMS equipment grant program. The legislation stipulates an annual allocation to OEMS/T of up to, but not more than, 3% of the total annual allocation for the administration of an adequate trauma system, monitoring statewide trauma care and recruiting additional participation in the trauma system.

All funds allocated to the GTCNC for the current fiscal year have been distributed, and no funds were provided to OEMS/T. The OEMS/T funds appear to have been utilized to support consultant services to perform an assessment of the costs of readiness and uncompensated care in Georgia and to fund the ACS Trauma System Consultation visit. As of this date, a source for continued funding for the GTCNC has not been identified though stakeholders express hope that the 2009 legislative session will result in a protected, sustainable funding stream for the GTCNC and the OEMS/T that is sufficient to ensure adequate personnel, infrastructure and support services needed to develop a fully inclusive trauma system.

Finally, the team noted that costs of trauma system participation, usually paid by the trauma system participants, including registry maintenance, designation, and site visits fees are instead being funded through the OEMS/T budget.

RECOMMENDATIONS

- **Identify a sustainable and protected revenue source for the essential administrative, personnel, and infrastructure costs for the trauma system's lead agency.**
- **Seek legislative changes to OCGA 31-11, Article 5 that continue the cost of readiness support to trauma centers and EMS, and clarify that the lead agency funding allotments must be payable before other funds are distributed.**
- **Link allocation of cost of readiness funding (for trauma centers, healthcare providers, EMS services, and participating trauma hospitals) to deliverables designed to support performance improvement in the areas of system management, access to care, patient safety and outcomes, and the financial stability of the system and its components.**
- Allocate a portion of funding available from the Georgia Trauma Fund to support new trauma center development.
- Charge the trauma system stakeholders with making recommendations for funding consistent with the goals and objectives of the Trauma System Plan.
- Seek to revise motor vehicle insurance policy requirements to include a personal injury protection clause sufficient to cover costs for significant injury care, modeled after New Jersey.

Trauma System Assurance

Prevention and Outreach

Purpose and Rationale

Trauma systems must develop prevention strategies that help control injury as part of an integrated, coordinated, and inclusive trauma system. The lead agency and providers throughout the system should be working with business organizations, community groups, and the public to enact prevention programs and prevention strategies that are based on epidemiologic data gleaned from the system.

Efforts at prevention must be targeted for the intended audience, well defined, and structured, so that the impact of prevention efforts is system-wide. The implementation of injury control and prevention requires the same priority as other aspects of the trauma system, including adequate staffing, partnering with the community, and taking advantage of outreach opportunities. Many systems focus information, education, and prevention efforts directly to the general public (for example, restraint use, driving while intoxicated). However, a portion of these efforts should be directed toward emergency medical services (EMS) and trauma care personnel safety (for example, securing the scene, infection control). Collaboration with public service agencies, such as the department of health is essential to successful prevention program implementation. Such partnerships can serve to synergize and increase the efficiency of individual efforts. Alliances with multiple agencies within the system, hospitals, and professional associations, working toward the formation of an injury control network, are beneficial.

Activities that are essential to the development and implementation of injury control and prevention programs include the following:

• A needs assessment focusing on the public information needed for media relations, public officials, general public, and third-party payers, thus ensuring a better understanding of injury control and prevention
• Needs assessment for the general medical community, including physicians, nurses, prehospital care providers, and others concerning trauma system and injury control information
• Preparation of annual reports on the status of injury prevention and trauma care in the system
• Trauma system databases that are available and usable for routine public health surveillance

OPTIMAL ELEMENTS

I. The lead agency informs and educates state, regional, and local constituencies and policy makers to foster collaboration and cooperation for system enhancement and injury control. **(B-207)**

a. The trauma system leaders (lead agency, advisory committees, and others) inform and educate constituencies and policy makers through community development activities, targeted media messaging, and active collaborations aimed at injury prevention and trauma system development. **(I-207.2)**

II. The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytic tools to monitor the performance of population based prevention and trauma care services. **(B-304)**

a. The lead agency, along with partner organizations, prepares annual reports on the status of injury prevention and trauma care in state, regional, or local areas. **(I-304.1)**

III. The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area. **(B-306)**

a. The trauma system is active within its jurisdiction in the evaluation of community based activities and injury prevention and response programs. **(I-306.2)**

b. The effect or impact of outreach programs (medical and community training and support and prevention activities) is evaluated as part of a system performance improvement process. **(I-306.3)**

CURRENT STATUS

Georgia has active injury prevention programs within the DHR as well as within the Governor's Office of Highway Safety (GOHS). Collaboration is evident between these agencies as the GOHS has awarded grants to the DHR Injury Prevention program for motor vehicle-related mechanisms of injury. The Injury Prevention program has previously received a Core Capacity grant from the Centers for Disease Control and Prevention (CDC). This funding supported the development of the *Injury Strategic Plan for Georgia* which provides a conceptual framework to facilitate collaboration across numerous state agencies for injury prevention programming.

While numerous organizations and agencies collaborate on implementation of prevention and outreach efforts (e.g., SafeKids, Students Against Destructive Decisions (SADD), Brain Injury Association, Georgia Firefighters Burn

Foundation, EMS providers, and trauma centers), it is not apparent that a formalized injury prevention advisory stakeholder group or coalition exists.

The *Profile of Injuries in Georgia 2005* identifies injury prevention strategies for motor vehicle, falls, and burn-related mechanisms of injury. Additionally, key resource websites are included in the document to direct injury prevention partners to effective prevention strategies.

Several examples were provided by participants regarding the implementation of effective injury prevention strategies, such as a Graduated Driver's License statute that has been associated with a significant reduction in adolescent driver mortality. Another focus has been to increase the correct use of child passenger safety seats.

The trauma centers are expected to engage in injury prevention programs as a designation requirement. Discussions with participants revealed that several trauma centers collaborate with other organizations to fulfill their injury prevention mission rather than independently leading the injury prevention outreach in their catchment area. Trauma center registry data should be used to identify the significant injury mechanisms in its catchment area, but trauma coordinators did not report use of their trauma registry data in the design or selection of injury prevention programs for implementation. However, it is not known if trauma center registry data are requested or used by prevention organizations for selection and evaluation of injury prevention programs.

Injury prevention is not currently integrated into Georgia's trauma system model as recommended by the HRSA *Model Trauma System Planning and Evaluation* document. An injury prevention coalition with support of the Office of Preparedness' Injury Prevention program would be an effective method for ensuring the inclusion of injury prevention into the Georgia trauma system.

RECOMMENDATIONS

- Ensure the integration of injury prevention leaders into the reactivated trauma system stakeholder group.

- Facilitate a collaborative relationship between trauma coordinators and the DHR injury prevention program to improve the knowledge of effective injury prevention strategies and potential partners for collaboration.

- Encourage the development of an injury prevention coalition.

Emergency Medical Services

Purpose and Rationale

The trauma system includes, and/or interacts with, many different agencies, institutions, and systems. The EMS system is one of the most important of these relationships. EMS is often the critical link between the injury-producing event and definitive care at a trauma center. Even though at its inception the EMS system was a very broad system concept, over time, EMS has come to be recognized as the prehospital care component of the larger emergency health care system. It is a complex system that not only transports patients, but also includes public access, communications, personnel, triage, data collection, and quality improvement activities.

The EMS system medical director must have statutory authority to develop protocols, oversee practice, and establish a means of ongoing quality assessment to ensure the optimal provision of prehospital care. If not the same individual, the EMS system medical director must work closely with the trauma system medical director to ensure that protocols and goals are mutually aligned. The EMS system medical director must also have ongoing interaction with EMS agency medical directors at local levels, as well as the state EMS for Children program, to ensure that there is understanding of and compliance with trauma triage and destination protocols.

Ideally, a system should have some means of ensuring whether resources meet the needs of the population. To achieve this end, a resource and needs assessment evaluating the availability and geographic distribution of EMS personnel and physical resources is important to ensure a rapid and appropriate response. This assessment includes a detailed description of the distribution of ground ambulance and aeromedical locations across the region. Resource allocations must be assessed on a periodic basis as needs dictate a redistribution of resources. In communities with full-time paid EMS agencies, ambulances should be positioned according to predictable geographic or temporal demands to optimize response efficiencies. Such positioning schemes require strong prehospital data collection systems that can track the location of occurrences over time. Periodic assessment of dispatch and transport times will also provide insight into whether resources are consistent with needs. Each region should have objective criteria dictating the level of response (advanced life support [ALS], basic life support [BLS]), the mode of transport, and the disposition of the patient based on the location of the incident and the severity of injury. A mechanism for case-based review of trauma patients that involves prehospital and hospital providers allows bidirectional information sharing and continuing education, ensuring that expectations are met at both ends. Ongoing review of triage and treatment decisions allows for continuing quality improvement of the triage and prehospital care protocols. A more detailed

discussion of in-field (primary) triage criteria is provided in the section titled: System Coordination and Patient Flow (p 20) (White Book).

Human Resources

Periodic workforce assessments of EMS should be conducted to ensure adequate numbers and distribution of personnel. EMS, not unlike other health care professions, experiences shortages and maldistribution of personnel. Some means of addressing recruitment, retention, and engagement of qualified personnel should be a priority. It is critical that trauma system leaders work to ensure that prehospital care providers at all levels attain and maintain competence in trauma care. Maintenance of competence should be ensured by requiring standards for credentialing and certification and specifying continuing educational requirements for all prehospital personnel involved in trauma care. The core curricula for First Responder, Emergency Medical Technician (EMT) Basic, EMT-Intermediate, EMT Paramedic, and other levels of prehospital personnel have an essential orientation to trauma care for all ages. However, trauma care knowledge and skills need to be continuously updated, refined, and expanded through targeted trauma care training such as Prehospital Trauma Life Support®, Basic Trauma Life Support®, and age-specific courses. Mechanisms for the periodic assessment of competence, educational needs, and education availability within the system should be incorporated into the trauma system plan.

Systems of excellence also encourage EMS providers to go beyond meeting state standards for agency licensure and to seek national accreditation. National accreditation standards exist for ground-based and air medical agencies, as well as for EMS educational programs. In some states, agency licensure requirements are waived or substantially simplified if the EMS agency maintains national accreditation.

EMS is the only component of the emergency health care and trauma system that depends on a large cadre of volunteers. In some states, substantially more than half of all EMS agencies are staffed by volunteers. These agencies typically serve rural areas and are essential to the provision of immediate care to trauma patients, in addition to provision of efficient transportation to the appropriate facility. In some smaller facilities, EMS personnel also become part of the emergency resuscitation team, augmenting hospital personnel. The trauma care system program should reach out to these volunteer agencies to help them achieve their vital role in the outcome of care of trauma patients. However, it must be noted that there is a delicate balance between expecting quality performance in these agencies and placing unrealistic demands on their response capacity. In many cases, it is better to ensure that there is an optimal BLS response available at all times rather than a sporadic or less timely response involving ALS personnel. Support to volunteer EMS systems may be in the form of quality improvement activities, training, clinical opportunities, and support to the system medical director.

Owing to the multidisciplinary nature of trauma system response to injury, conferences that include all levels of providers (for example, prehospital personnel, nurses, and physicians) need to occur regularly with each level of personnel respected for its role in the care and outcome of trauma patients. Communication with and respect for prehospital providers is particularly important, especially in rural areas where exposure to major trauma patients might be relatively rare.

Integration of EMS Within the Trauma System

In addition to its critical role in the prehospital treatment and transportation of injured patients, EMS must also be engaged in assessment and integration functions that include the trauma system and also public health and other public safety agencies. EMS agencies should have a critical role in ensuring that communication systems are available and have sufficient redundancy so that trauma system stakeholders will be able to assess and act to limit death and disability at the single patient level and at the population level in the case of mass casualty incidents (MCIs). Enhanced 9-1-1 services and a central communication system for the EMS/trauma system to ensure field-to-facility bidirectional communications, interfacility dialogue, and all-hazards response communications among all system participants are important for integrating a system's response. Wireless communications capabilities, including automatic crash notification, hold great promise for quickly identifying trauma-producing events, thereby reducing delays in discovery and decreasing prehospital response intervals.

Further integration might be accomplished through the use of EMS data to help define high-risk geographic and demographic characteristics of injuries within a response area. EMS should assist with the identification of injury prevention program needs and in the delivery of prevention messages. EMS also serves a critical role in the development of all-hazards response plans and in the implementation of those plans during a crisis. This integration should be provided by the state and regional trauma plan and overseen by the lead agency. EMS should participate through its leadership in all aspects of trauma system design, evaluation, and operation, including policy development, public education, and strategic planning.

OPTIMAL ELEMENTS

I. The trauma system is supported by an EMS system that includes communications, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated. **(B-302)**

a. There is well-defined trauma system medical oversight integrating the specialty needs of the trauma system with the medical oversight for the overall EMS system. **(I-302.1)**

b. There is a clearly defined, cooperative, and ongoing relationship between the trauma specialty physician leaders (for example, trauma medical director within each trauma center) and the EMS system medical director. **(I-302.2)**

c. There is clear-cut legal authority and responsibility for the EMS system medical director, including the authority to adopt protocols, to implement a performance improvement system, to restrict the practice of prehospital care providers, and to generally ensure medical appropriateness of the EMS system. **(I-302.3)**

d. The trauma system medical director is actively involved with the development, implementation, and ongoing evaluation of system dispatch protocols to ensure they are congruent with the trauma system design. These protocols include, but are not limited to, which resources to dispatch, for example, ALS versus BLS, airground coordination, early notification of the trauma care facility, prearrival instructions, and other procedures necessary to ensure that resources dispatched are consistent with the needs of injured patients. **(I-302.4)**

e. The retrospective medical oversight of the EMS system for trauma triage, communications, treatment, and transport is closely coordinated with the established performance improvement processes of the trauma system. **(I-302.5)**

f. There is a universal access number for citizens to access the EMS/trauma system, with dispatch of appropriate medical resources. There is a central communication system for the EMS/trauma system to ensure field- to-facility bidirectional communications, interfacility dialogue, and all-hazards response communications among all system participants. **(I-302.7)**

g. There are sufficient and well-coordinated transportation resources to ensure that EMS providers arrive at the scene promptly and expeditiously transport the patient to the correct hospital by the correct transportation mode. **(I-302.8)**

II. The lead trauma authority ensures a competent workforce. **(B-310)**

a. In cooperation with the prehospital certification and licensure authority, set guidelines for prehospital personnel for initial and ongoing trauma training, including trauma-specific courses and courses that are readily available throughout the state. **(I-310.1)**

b. In cooperation with the prehospital certification and licensure authority, ensure that prehospital personnel who routinely provide care to trauma patients have a current trauma training certificate, for example, Prehospital Trauma Life Support or Basic Trauma Life Support and others, or that trauma training needs are driven by the performance improvement process. **(I-310.2)**

c. Conduct at least 1 multidisciplinary trauma conference annually that encourages system and team approaches to trauma care. **(I-310.9)**

III. The lead agency acts to protect the public welfare by enforcing various laws, rules, and regulations as they pertain to the trauma system. **(B-311)**

a. Incentives are provided to individual agencies and institutions to seek state or nationally recognized accreditation in areas that will contribute to overall improvement across the trauma system, for example, Commission on Accreditation of Ambulance Services for prehospital agencies, Council on Allied Health Education Accreditation for training programs, and American College of Surgeons (ACS) verification for trauma facilities. **(I-311.6)**

CURRENT STATUS

The regulation of EMS services resides within the Division of Public Health within the DHR. Municipalities and counties have no specific requirement at the local level to ensure that community residents have access to EMS, unlike the requirement that ensures community fire and law enforcement services.

The EMS system provides patient care primarily by “home rule” which is associated with inconsistency, virtually no incentive for standardization of care, and wide variation in use of introspective performance improvement. This structure limits the ability of the current EMS system to integrate with systems of care for the treatment of patients with trauma and other acute time-sensitive illnesses that require coordinated care, appropriate triage, and transport to receiving facilities with specialized resources.

Clear and dramatic progress in the availability of E9-1-1 throughout the state has occurred. Currently, four counties do not have this essential public safety resource, in contrast to 32 counties 3 years ago. Although no timeline was provided for ensuring access to E9-1-1 for the four remaining counties, efforts were reported to attain that service through technology grants or partnerships with neighboring counties.

Of the stakeholders present, including individuals with medical oversight of dispatch centers, no knowledge was identified of a plan for dispatch centers to incorporate telematic information from automatic crash notification systems into dispatch protocols.

Ambulance services across the state all provide some level of advanced life support (ALS) care with minimum staffing of either an emergency medical technician (EMT) Intermediate or Paramedic provider level. It is laudable that all ambulances in the state are staffed to provide ALS services. The current EMT-

Intermediate training and credentialing process is using the 1985 National Standard Curriculum. Nationally, this level of certification most closely aligns with the new Advanced EMT scope of practice.

The state also recognizes neonatal transport services and has proposed regulations to recognize air ambulance services. No structure for state-recognized critical care transport ambulance services currently exists.

Eighteen air ambulances are stationed at various locations within the state, a mix of hospital-owned and privately-owned air medical services. The distribution of air medical services leaves a void in the south-central region of the state. Unfortunately, this also corresponds to the region of the state with the highest trauma mortality rate and the longest distances to designated trauma centers. Apparently, an air medical ambulance was based in this south-central area in the past, but the base was repositioned after less than 2 years.

The state provides no guidance related to how and who should request air medical resources. It was reported that requests are often received by the private phone number of the air ambulance service. It is possible for providers to request two or more air ambulances for a single patient because there is no requirement for these requests go through the 9-1-1 dispatch center within the jurisdiction. Additional challenges include no requirements for the air ambulance service to send the closest aircraft, and no requirement for an air ambulance to transport the patient to the closest trauma center capable of meeting the patient's needs. Participants reported that currently only two of the air ambulance services are Commission on Accreditation of Medical Transport Services (CAMTS) certified, and only two services submit patient care reports to the Georgia EMS Information System (GEMSIS).

Regional EMS councils are established, and they award primary EMS response zones to ambulance services within their region. Two counties were reported to have no ambulance service, but no evidence of a recent needs assessment of the availability and geographic distribution of ground ambulances was reported.

Advisory groups to the OEMS/T include the Georgia EMS Advisory Committee and the Georgia EMS Medical Directors Advisory Committee. These committees provide opportunities for aligning committed stakeholders, increasing communication across the system, and standardizing care and policies. The OEMS/T seems to have variable and irregular communication with the regional EMS councils and with various stakeholder groups. These advisory groups are frustrated because the DHR is disengaged and responds slowly, or not at all, to recommendations to improve the system.

The individual ambulance services function primarily under "home rule," and the local medical director is responsible for oversight of the medical care, including stewardship of the service's local protocols. While Georgia has a state EMS

medical director, it is not apparent that this individual or position is recognized by statute or regulation. The medical oversight lies overwhelmingly at the local ambulance service level, and physicians have no educational requirements to serve as local medical directors.

The EMS statue provides for liability protection for EMS physicians that provide unpaid services. Limiting this protection to unpaid services may be a disincentive for the recruitment and retention of local EMS medical directors that might be willing to become more involved if appropriately compensated for these responsibilities. It is unclear whether the state EMS medical director would have any liability protection as a state employee or under the sovereign immunity of the state. The system should support the statewide medical director with appropriate compensation and resources to perform the role. Additionally, protections for regional and local medical directors should be structured to encourage and support the participation of physicians that are qualified for these roles (e.g. practicing emergency physicians or other physicians who have received state-supported preparation).

Recommended statewide EMS protocols exist, and the most current version was approved in November 2007 and is posted on the OEMS/T website. These protocols serve as a suggested template, but stakeholders reported wide variation in the use of these protocols. Of particular note, the current protocols include the most recent version of the CDC/ACS trauma triage scheme. While it is outstanding that the statewide EMS protocols include this relatively recent triage scheme, it was clear that many participants were not aware of the existence of this state-recommended protocol. As an example, it was reported that some ambulance services do not have a trauma triage protocol and some are using older versions of the ACS protocol. EMS services appear to use variations of these protocols without any consistency within or between regions.

Destination procedures that align patient severity with the most appropriate receiving acute care facility have some notable weakness. Some anecdotal reports were provided by EMS providers about contacting hospitals to determine whether the hospital could accommodate a patient with orthopedic or neurosurgical injuries. EMS services also reported concerns about leaving their primary service areas when transporting patients to appropriate, but more distant, trauma receiving facilities.

Participants agreed that the ability to communicate between EMS providers and base station medical control is widely available, but state guidance for on-line medical direction is absent. The state has no required qualifications for base station physicians, no required audio recording or other documentation of medical control orders, and no required education related to EMS procedures or protocols for base station control physicians.

The OEMS/T and the regional EMS offices are understaffed as described in the Lead Agency and Human Resources section. Critical positions, such as the EMS Training Coordinator within the OEMS/T are not currently filled. Due to hiring freezes and understaffing, the OEMS/T has had significant delays in completing critical functions to ensure the competence of EMS providers (e.g. the assurance that certified EMS providers have completed required continuing education, timely follow-up on complaints, and credentialing). The degree of negative impact on the public's health and welfare caused by these inadequacies is not known.

The state EMS medical director is immersed in the system at a level higher than the OEMS/T, and he supervises several programs within the Office of Preparedness. Although the state EMS medical director is qualified and knowledgeable regarding EMS medical direction, this individual is not able to commit significant time exclusively to the medical oversight of the EMS and trauma system.

Regulations require that EMS personnel maintain at least 40 hours of continuing education every 2 years, with at least 4 of those hours committed to trauma-related education. While it is good that at least 10% of the required continuing education must be related to trauma, it was reported that the state confirmation of EMS provider completion of the required CE is delayed. This may have implications regarding EMS provider competence and on public health and safety.

The state has developed the Georgia EMS Information System (GEMSIS), and this database is based upon the National EMS Information System (NEMSIS) dataset. The GEMSIS database and web-entry system are in their infancy, and EMS providers reported reluctance to trust the data that has been obtained from the system thus far. It is not known if this data system is being used to obtain information for ambulance service process improvement or for system level questions. A robust performance improvement (PI) program that uses the GEMSIS data will demonstrate to field level providers and service level managers the benefits of providing accurate data to this system.

RECOMMENDATIONS

- **Provide the Office of EMS and Trauma and the Regional EMS Offices with adequate staff to efficiently manage and ensure that EMS services and providers are appropriately educated, credentialed, licensed, certified, and monitored to ensure competent patient care.**
- **Appoint a state EMS medical director who has medical oversight of the EMS system as that individual's primary focus.**

- **Ensure that each region has an established plan for back-up EMS coverage at the local level when the patient's condition requires primary transport to a distant trauma center or specialty care facility.**
- Complete the approval process for the updated EMS regulations that include the ability to regulate air medical ambulances.
    - Develop minimum equipment lists, requirements for staffing, requirements for submission of patient care reports to GEMSIS, and other policies related to air medical regulation.
- Provide incentives (linked to trauma fund distribution) to ensure that local ambulance service protocols critical to trauma system care are consistent with statewide protocol guidelines.
    - Tie subsequent funding incentives to compliance with protocols for trauma triage, use of air ambulance transport, and trauma patient destination.
- Perform a needs assessment that analyzes the availability and geographic distribution of EMS personnel and ground/ air ambulances.
    - Consider whether a need exists to recognize and develop ground critical care ambulance services.
- Seek a National Highway Traffic Safety Administration (NHTSA) EMS system technical reassessment to review the current EMS system.
- Implement a verifiable system for regional online medical control by credentialed medical control physicians, including a formal quality improvement process.
- Ensure that all local/regional EMS medical directors have basic education in EMS medical direction and ensure that regular communication between the state, regional, and local medical directors occurs to increase the consistency in protocols and patient care.
    - Consider on-line options for initial training and orientation.
- Establish guidelines or protocols for the use of air ambulances that are based on principles of necessity and safety.
    - Develop procedures for requesting, dispatching, and determining patient destinations.
    - Ensure that ground EMS services have plans for patient care and transport to appropriate receiving centers when air ambulances are not available or not indicated.
- Revise regulations to align EMS provider levels with those in the new national scope of practice model.

- Build multidisciplinary regional performance improvement (PI) committees that initially perform regular reviews of system process indicators and transition to clinical PI over time.

Definitive Care Facilities

Purpose and Rationale

Inclusive trauma systems are the systems that include all acute health care facilities, to the extent that their resources and capabilities allow and in which the patient's needs are matched to hospital resources and capabilities. Thus, as the core of a regional trauma system, acute care facilities operating within an inclusive trauma system provide definitive care to the entire spectrum of patients with traumatic injuries. Acute care facilities must be well integrated into the continuum of care, including prevention and rehabilitation, and operate as part of a network of trauma-receiving hospitals within the public health framework. All acute care facilities should participate in the essential activities of a trauma system, including performance improvement, data submission to state or regional registries, representation on regional trauma advisory committees, and mutual operational agreements with other regional hospitals to address interfacility transfer, educational support, and outreach. The roles of all definitive care facilities, including specialty hospitals (for example, pediatric, burn, severe traumatic brain injury [TBI], spinal cord injury [SCI]) within the system should be clearly outlined in the regional trauma plan and monitored by the lead agency. Facilities providing the highest level of trauma care are expected to provide leadership in education, outreach, patient care, and research and to participate in the design, development, evaluation, and operation of the regional trauma system.

In an inclusive system, patients should be triaged to the appropriate facility based on their needs and facility resources. Patients with the least severe injuries might be cared for at appropriately designated facilities within their community, whereas the most severe should be triaged to a Level I or II trauma center. In rural and frontier systems, smaller facilities must be ready to resuscitate and initiate treatment of the major injuries and have a system in place that will allow for the fastest, safest transfer to a higher level of care.

Trauma receiving facilities providing definitive care to patients with other than minor injuries must be specifically designated by the state or regional lead agency and equipped and qualified to do so at a level commensurate with injury severity. To assess and ensure that injury type and severity are matched to the qualifications of the facilities and personnel providing definitive care, the lead agency should have a process in place that reviews and verifies the qualifications of a particular facility according to a specific set of resource and quality standards. This criteria-based process for review and verification should be consistent with national standards and be conducted on a periodic cycle as determined by the lead agency. When centers do not meet set standards, there should be a process for suspension, probation, revocation, or dedesignation.

Designation by the lead agency should be restricted to facilities meeting criteria or statewide resource and quality standards and based on patient care needs of the regional trauma system. There should be a well-defined regulatory relationship between the lead agency and designated trauma facilities in the form of a contract, guidelines, or memorandum of understanding. This legally binding document should define the relationships, roles, and responsibilities between the lead agency and the medical leadership from each designated trauma facility. The number of trauma centers by level of designation and location of acute care facilities must be periodically assessed by the lead agency with respect to patient care needs and timely access to definitive trauma care. There should be a process in place for augmenting and restricting, if necessary, the number and/or level of acute care facilities based on these periodic assessments. The trauma system plan should address means for improving acute care facility participation in the trauma system, particularly in systems in which there has been difficulty addressing needs.

Human Resources

The ability to deliver high-quality trauma care is highly dependent on the availability of skilled human resources. Therefore, it is critical to assess the availability and educational needs of providers on a periodic basis. Because availability, particularly of subspecialty resources, is often limited, some means of addressing recruitment, retention, and engagement of qualified personnel should be a priority. Periodic workforce assessments should be conducted. Maintenance of competence should be ensured by requiring standards for credentialing and certification and specifying continuing educational requirements for physicians and nurses providing care to trauma patients. Mechanisms for the periodic assessment of ancillary and subspecialty competence, educational needs, and availability within the system for all designated facilities should be incorporated into the trauma system plan. The lead trauma centers in rural areas will need to consider teleconferencing and telemedicine to assist smaller facilities in providing education on regionally identified needs. In addition, lead trauma centers within the region should assist in meeting educational needs while fostering a team approach to care through annual educational multidisciplinary trauma conferences. These activities will do much to foster a sense of teamwork and a functionally inclusive system.

Integration of Designated Trauma Facilities Within the Trauma System

Designated trauma facilities must be well integrated into all other facets of an organized system of trauma care, including public health systems and injury surveillance, prevention, EMS and prehospital care, disaster preparedness, rehabilitation, and system performance improvement. This integration should be provided by the state and/or regional trauma plan and overseen by the lead agency.

Each designated acute care facility should participate, through its trauma program leadership, in all aspects of trauma system design, evaluation, and operation. This participation should include policy and legislative development,

legislative and public education, and strategic planning. In addition, the trauma program and subspecialty leaders should provide direction and oversight to the development, implementation, and monitoring of integrated protocols for patient care used throughout the system (for example, TBI guidelines used by prehospital providers and nondesignated transferring centers), including region specific primary (field) and secondary (early transfer) triage protocols. The highest level trauma facilities should provide leadership of the regional trauma committees through their trauma program medical leadership. These medical leaders, through their activities on these committees, can assist the lead agency and help ensure that deficiencies in the quality of care within the system, relative to national standards, are recognized and corrected. Educational outreach by these higher levels centers should be used when appropriate to help achieve this goal.

OPTIMAL ELEMENTS

I. Acute care facilities are integrated into a resource efficient, inclusive network that meets required standards and that provides optimal care for all injured patients. **(B-303)**

a. The trauma system plan has clearly defined the roles and responsibilities of all acute care facilities treating trauma and of facilities that provide care to specialty populations (for example, burn, pediatric, SCI, and others). **(I-303.1)**

II. To maintain its state, regional, or local designation, each hospital will continually work to improve the trauma care as measured by patient outcomes. **(B-307)**

a. The trauma system engages in regular evaluation of all licensed acute care facilities that provide trauma care to trauma patients and of designated trauma hospitals. Such evaluation involves independent external reviews. **(I-307.1)**

III. The lead trauma authority ensures a competent workforce. **(B-310)**

a. As part of the established standards, set appropriate levels of trauma training for nursing personnel who routinely care for trauma patients in acute care facilities. **(I-310.3)**

b. Ensure that appropriate, approved trauma training courses are provided for nursing personnel on a regular basis. **(I-310.4)**

c. In cooperation with the nursing licensure authority, ensure that all nursing personnel who routinely provide care to trauma patients have a trauma training certificate (for example, Advanced Trauma Care for Nurses, Trauma Nursing Core Course, or any national or state trauma nurse verification course). As an alternative after initial trauma course

completion, training can be driven by the performance improvement process. **(I-310.5)**

d. In cooperation with the physician licensure authority, ensure that physicians who routinely provide care to trauma patients have a current trauma training certificate of completion, for example, Advanced Trauma Life Support® (ATLS®) and others. As an alternative, physicians may maintain trauma competence through continuing medical education programs after initial ATLS completion. **(I-310.8)**

e. Conduct at least 1 multidisciplinary trauma conference annually that encourages system and team approaches to trauma care. **(I-310.9)**

f. As new protocols and treatment approaches are instituted within the system, structured mechanisms are in place to inform all personnel about the changes in a timely manner. **(I-310-10)**

CURRENT STATUS

DHR currently has the authority to designate, re-designate, and de-designate trauma centers, which can include levels I, II, III, and IV. The trauma program manager coordinates the designation process, and designation visits use a process based, in principle, on the ACS *Resources for Optimal Care of the Injured Patient* document. The process used has never been officially approved by DHR.

An acute care facility seeking designation must notify their Regional EMS Council and the OEMS/T, and following approval to proceed, the facility must submit a formal application that includes a pre-review questionnaire (PRQ) and a request for site visit. The facility must obtain the state trauma registry software program (GTRACS) from OEMS/T and collect at least 90 days of data prior to the site visit. Upon completion of the application, a trauma facility site review team is appointed with either in-state or out-or-state reviewers including a trauma surgeon, emergency medicine physician, and trauma coordinator. A representative of OEMS/T facilitates the visit, and a summary review is provided by the site team after completion of the visit. The trauma program manager submits the findings and recommendations regarding the acute care facility's application to the DHR's Director of the Division of Public Health for final action within 30 days of the site visit.

Delays in the receipt of formal notification of designation/re-designation were reported. Re-designation visits are scheduled every three years, with interim visits by the trauma program as necessary to monitor critical and non-critical variances. According to policy, each designated center is to receive a periodic review by the trauma program, including at least one annual visit.

Though Georgia loosely follows ACS guidelines, it is recognized that some criteria are challenging for many acute care facilities. When a significant deficiency is identified, the state addresses that deficiency and works with the acute care facility until it is resolved. If a less significant deficiency is identified, a waiver may be granted and the acute care facility is designated. The current policy guiding trauma center designation does not identify significant (essential) and less significant (desirable) criteria for designation. Therefore, it is unclear if the decisions regarding designation are applied uniformly to each acute care facility.

Fifteen trauma centers are currently designated, including 4 level I, 7 level II, 2 level IV, and 2 pediatric centers. One level III center voluntarily withdrew from designation in the past two years. System participation is voluntary, and the Georgia trauma system currently consists of a loosely affiliated network of the designated trauma centers. Though the distribution of trauma centers is reasonable, no guidelines exist for the optimal location and number of designated trauma centers. The south and southeastern regions are up to 100 miles from a Georgia trauma center. Patients in border areas are also transported to trauma centers in Chattanooga, TN, Jacksonville, FL, Tallahassee, Fl and Birmingham, AL. The trauma centers in neighboring states are not integrated into Georgia's trauma system.

The level I trauma centers all reported to be functioning at or beyond capacity. These trauma centers are experiencing progressive workforce shortages, especially with the continuing restrictions on resident work hours. Midlevel providers are used in some trauma centers, but are inadequate to compensate for the resident work hour losses. Diversion and temporary closures to transfers were reported to be an ongoing concern, prompted most often by limited intensive care unit bed availability. Both level I and II trauma centers reported specialty physician coverage issues, including neurosurgery, orthopedics, plastic, oral maxillofacial. General surgery was reported to be problem in level II and IV trauma centers. Coverage and workforce issues are monitored periodically by the trauma program, but they are managed with varying success by each facility.

The state has no destination guidelines, management protocols, and transfer policies for seriously injured patients initially transported to non-trauma hospitals. The current system is not inclusive, and transfers are arranged on an ad hoc basis, most often predicated by historic referral patterns.

Non-trauma hospital emergency departments are staffed by a variety of physicians, many of whom are not emergency medicine trained or certified. No evidence was provided that Advanced Trauma Life Support ™ (ATLS) was a minimum requirement for non-emergency medicine trained physicians in these facilities. No assumption can be made that the hospital personnel in non-trauma acute care facilities are adequately trained to identify, stabilize, and arrange transfer utilizing defined criteria for trauma patients that exceed their capabilities.

Data are not available currently to monitor emergency department length of stay or the quality of care prior to interfacility transfer. Non-trauma hospitals do not have defined trauma system roles and responsibilities for trauma patients who arrive in their facilities.

Educational standards and care provider credentialing in designated trauma centers are the responsibility of each facility, following ACS guidelines. The OEMS/T does not sponsor regional or statewide educational conferences, but the Trauma Advocates of Georgia (TAG), comprised primarily of trauma nurse coordinators, has sponsored a statewide educational trauma symposium for the past six years.

Trauma center representatives report frequent transfers of patients with isolated, single system injuries (mandible fractures, ankle fractures, etc.) that could easily be managed in local participating hospitals of an inclusive trauma system. No criteria or guidelines currently exist for selection of appropriate patients for trauma center transfer.

Two pediatric trauma centers and two burn centers provide appropriate statewide access. Patients between ages 15 and 18 years have variable access to the pediatric trauma centers based on the nature of their injuries and resource availability, and they may be managed in adult trauma centers.

Efforts to recruit new level II and III trauma centers are underway, especially in the underserved southern regions. The success of these recruitment efforts may be contingent on the outcome of funding strategies currently before the legislature.

Quality of care and outcomes of trauma care are not systematically or consistently monitored or benchmarked except within the designated trauma centers. Evidence-based best care practices and standards for education and provider competence do not exist across the system except, perhaps, at the individual trauma centers. No evaluation of trauma care practices and performance by non-trauma acute care facilities is conducted by OEMS/T.

Though Regional EMS Councils are involved in the designation and re-designation process, their relationship and interaction with designated trauma centers in the region is otherwise poorly defined. Though the trauma coordinators and registrars meet bimonthly along with the OEMS staff, it is unclear if the trauma medical directors and other members of the multidisciplinary team (emergency medicine, rehabilitation, EMS) meet or collaborate regularly on regional or statewide initiatives.

RECOMMENDATIONS

- **Define roles, responsibilities, and accountabilities for all acute care facilities in an inclusive system related to trauma care.**
- **Establish uniform, clearly defined designation criteria, including critical and non-critical criteria deficiencies for each trauma center level, modeled on current American College of Surgeons' guidelines.**
    - **Apply criteria consistently to all centers.**
- Develop a plan to transition to the ACS verification process to assure standardization and objectivity of the review process.
- Recruit new trauma centers (all levels) in geographically appropriate locations.
- Establish minimum criteria for inclusion as a participating acute care facility in the trauma system.
    - Tie participation in the trauma system as a condition of hospital licensure.

System Coordination and Patient Flow

Purpose and Rationale

To achieve the best possible outcomes, the system must be designed so that the right patient is transported to the right facility at the right time. Although on the surface this objective seems relatively straightforward, patients, geography, and transportation systems often conspire to present significant challenges. The most critically injured trauma patient is often easy to identify at the scene by virtue of the presence of coma or hypotension. However, in some circumstances, the patients requiring the resources of a Level I or II center may not be immediately apparent to prehospital providers. Primary or field triage criteria aid providers in identifying which patients have the greatest likelihood of adverse outcomes and might benefit from the resources of a designated trauma center. Even if the need is identified, regional geography or limited air medical (or land) transport services might not allow for direct transport to an appropriate facility.

Primary triage of a patient from the field to a center capable of providing definitive care is the goal of the trauma system. However, there are circumstances (for example, airway management, rural environments, inclement weather) when triaging a patient to a closer facility for stabilization and transfer is the best option for accessing definitive care. Patients sustaining severe injuries in rural environments might need immediate assessment and stabilization before a long-distance transport to a trauma center. In addition, evaluation of the patient might bring to light severe injuries for which needed care exceeds the resources of the initial receiving facility. Some patients might have specific needs that can be addressed at relatively few centers within a region (for example, pediatric trauma, burns, severe TBI, SCI, and reimplantation). Finally, temporary resource limitations might necessitate the transfer of patients between acute care facilities.

Secondary triage at the initial receiving facility has several advantages in systems with a large rural or suburban component. The ability to assess patients at nondesignated or Level III to V centers provides an opportunity to limit the transfer of only the most severely injured patients to Level I or II facilities, thus preserving a limited resource for patients most in need. It also provides patients with lesser injuries the possibility of being cared for within their community.

The decision to transfer a trauma patient should be based on objective, prospectively agreed-on criteria. Established transfer criteria and transfer agreements will minimize discussions about individual patient transfers, expedite the process, and ensure optimal patient care. Delays in transfer might increase mortality, complications, and length of stay. A system with an excess of transferred patients might tax the resources of the regional trauma facility. Conversely, inappropriate retention of patients at centers without adequate facilities or expertise might increase the risk of adverse outcomes. Given the

importance of timely, appropriate interfacility transfers, the time to transfer, as well as the rates of primary and secondary overtriage basis, and corrective actions should be instituted when problems are identified. Data derived from tracking and monitoring the timeliness of access to a level of trauma care commensurate with injury type and severity should be used to help define optimal system configuration.

A central communications center with real-time access to information on system resources greatly facilitates the transfer process. Ideally, this center identifies a receiving facility, facilitates dialogue between the transferring and receiving centers, and coordinates interfacility transport.

To ensure that the system operates at the greatest efficiency, it is important that patients are repatriated back to community hospitals once the acute phase of trauma care is complete. The process of repatriation opens up the limited resources available to care for severely injured patients. In addition, it provides an opportunity to bring patients back into their local environment where their social network might help reintegrate patients into their community.

OPTIMAL ELEMENTS

I. The trauma system is supported by an EMS system that includes communications, medical oversight, prehospital triage, and transportation; the trauma system, EMS system, and public health agency are well integrated. **(B-302)**

a. There are mandatory system-wide prehospital triage criteria to ensure that trauma patients are transported to an appropriate facility based on their injuries. These triage criteria are regularly evaluated and updated to ensure acceptable and system-defined rates of sensitivity and specificity for appropriately identifying a major trauma patient. **(I-302.6)**

b. There is a universal access number for citizens to access the EMS/trauma system, with dispatch of appropriate medical resources. There is a central communications system for the EMS/trauma system to ensure field-to-facility bidirectional communications, interfacility dialogue, and all-hazards response communications among all system participants. **(I-302.7)**

c. There is a procedure for communications among medical facilities when arranging for interfacility transfers, including contingencies for radio or telephone system failure. **(I-302.9)**

II. Acute care facilities are integrated into a resource-efficient, inclusive network that meets required standards and that provides optimal care for all injured patients. **(B-303)**

a. When injured patients arrive at a medical facility that cannot provide the appropriate level of definitive care, there is an organized and regularly

monitored system to ensure that the patients are expeditiously transferred to the appropriate system-defined trauma facility. **(I-303.4)**

CURRENT STATUS

At present, the trauma system has no universally accepted and utilized prehospital triage protocol. Enhanced 9-1-1 is in use throughout most of the state, with the exception of four counties. See the Emergency Medical Services section for additional detail.

Efforts to provide oversight and leadership for the trauma and EMS programs are hampered by the absence of regular meetings among the leadership of the EMS Regions and the OEMS/T.

Local EMS units utilize resource-dependent patterns of patient delivery which often result in seriously injured patients being taken to hospitals that are not trauma centers designated at any level. In other cases, air medical transport is used to deliver patients with significant injuries directly to the trauma centers. In locales where a trauma center is within a reasonable driving distance, EMS is more likely to deliver injured persons directly to the closest trauma center than the one most appropriate to their needs. Inconsistent trauma center resources and diversion further complicate the ability of the EMS providers to connect the patient with the health facility best suited to care for his/her injuries.

Trauma center diversion occurs frequently and is based on evaluation by each trauma center of its own resource status. This was reported to require the non-trauma hospitals to make multiple phone calls searching for a trauma center that will accept an injured patient in need of a higher level of care. This time-consuming task causes further delays in transferring the patients to the care needed, with a potential associated negative impact on morbidity and mortality.

The state has no patient selection guidelines to assist non-trauma hospitals to identify the patients that would most benefit from timely transfer to a higher level of care. Additionally, no mechanism is available to monitor the patient's dwell times in sending facilities. Transfer agreements are not universally in place.

Trauma center representatives consistently reported no problems obtaining burn center beds and pediatric trauma beds. However, waiting for rehabilitation beds was reported to be a significant problem, often requiring trauma patients to be held unnecessarily in ICU beds. This backs up the flow of patients into the trauma center and contributes to excessive diversion.

Several trauma centers reported having transfer programs that primarily serve to accept and arrange transport into their own facilities. Many have their own patient transport programs. The pediatric transfer center assists in locating a

pediatric bed in another appropriate facility should they not have one available in either of Georgia's pediatric trauma centers. EMS Region 4 has a website that lists all hospitals in the state and their diversion status, with periodic updates. It is generally only used by hospitals in that region, but is accessible to all. One emergency preparedness project includes a website (www.liveprocess.com) to monitor bed availability by institutions statewide. At this time, there is an estimated one-hour delay between query and when the website is updated, reducing its usefulness to providers seeking current status information.

The GTCNC has prioritized the need to develop a statewide interfacility transfer system which will build on these existing programs. The goal of this effort is a centralized transfer system to identify available beds and assist in getting patients moved to tertiary or specialty centers with a single phone call.

An analysis of 2006 hospital discharge data revealed that many injured patients receive care outside the existing trauma centers. Participants reported a consensus that Georgia needs additional trauma centers, with working estimates of 10 to 15 level I, II, and III trauma centers. The GTCNC has identified some candidates for trauma centers among acute care facilities in the underserved southern region of the state. To date, the state has had no success in recruiting these facilities. Hospitals are permitted to apply for trauma center designation at a level lower than perceived to be their full potential. Lack of agreement between medical staff and hospital administration to pursue trauma center designation was cited as a primary factor for a hospital's lack of interest in joining the trauma system.

A data collection pilot program for Critical Access Hospitals was attempted but discontinued due to human resource issues. Identifying ways to overcome this barrier, such as a more limited dataset, is essential to the recruitment and participation of smaller facilities as Level IV trauma centers. The Governor's office has plans to contact hospital and medical staff leadership of key non-trauma center hospitals throughout the state to collect information that could help identify the primary barriers to recruiting additional hospitals to serve as trauma centers.

The concept of repatriation of patients back to their community hospitals has not been explored fully, nor has a relationship with insurers been developed by the trauma system. A repatriation model could contribute to improved patient movement in and out of trauma centers, and may reduce diversion.

RECOMMENDATIONS

- **Establish state criteria for trauma center diversion with regional adoption of notification plans and time frames for diversion. Make**

diversion a reportable event tied to funding support and trauma center designation.

- Monitor compliance with EMS triage, interfacility transfer, and hospital diversion policies in the regional and statewide trauma system performance improvement programs.
- Develop and disseminate guidelines for the identification of patients appropriate for interfacility transfer.
- Establish uniform destination protocols for interfacility transfer based on geography and optimal patient care.
- Explore the concept of repatriation as a mechanism for returning recovering trauma patients to their community hospitals and opening up acute care trauma beds for incoming trauma patients more quickly.

Rehabilitation

Purpose and Rationale

As an integral component of the trauma system, rehabilitation services in acute care and rehabilitation centers provide coordinated care for trauma patients who have sustained severe or catastrophic injuries, resulting in long-standing or permanent impairments. Patients with less severe injuries may also benefit from rehabilitative programs that enhance recovery and speed return to function and productivity. The goal of rehabilitative interventions is to allow the patient to return to the highest level of function, reducing disability and avoiding handicap whenever possible. The rehabilitation process should begin in the acute care facility as soon as possible, ideally within the first 24 hours. Inpatient and outpatient rehabilitation services should be available. Rehabilitation centers should have CARF (Commission of Accreditation of Rehabilitation Facilities) accreditation for comprehensive inpatient rehabilitation programs, and accreditation of specialty centers (SCI and TBI) should be strongly encouraged.

The trauma system should conduct a rehabilitation needs assessment (including specialized programs in SCI, TBI, and for children) to identify the number of beds needed and available for rehabilitation in the geographic region. Rehabilitation specialists should be integrated into the multidisciplinary advisory committee to ensure that rehabilitation issues are integrated into the trauma system plan. The trauma system should demonstrate strong linkages and transfer agreements between designated trauma centers and rehabilitation facilities located in its geographic region (in or out of state). Plans for repatriation of patients, especially when rehabilitation centers across state lines are used, should be part of rehabilitation system planning. Feedback on functional outcomes after rehabilitation should be made available to the trauma centers.

OPTIMAL ELEMENTS

I. The lead agency ensures that adequate rehabilitation facilities have been integrated into the trauma system and that these resources are made available to all populations requiring them. **(B-308)**

a. The lead agency has incorporated, within the trauma system plan and the trauma center standards, requirements for rehabilitation services, including interfacility transfer of trauma patients to rehabilitation centers. **(I-308.1)**

b. Rehabilitation centers and outpatient rehabilitation services provide data on trauma patients to the central trauma system registry that include final disposition, functional outcome, and rehabilitation costs and also participate in performance improvement processes. **(I-308.2)**

II. A resource assessment for the trauma system has been completed and is regularly updated. **(B-103**)

a. The trauma system has completed a comprehensive system status inventory that identifies the availability and distribution of current capabilities and resources. **(I-103.1)**

CURRENT STATUS

A system wide assessment and inventory of rehabilitation resources has not been conducted. A total of 17 rehabilitation facilities (6 specialty facilities and 11 long-term acute care hospitals) were identified from the Georgia Hospital Association membership directory, including the Shepherd Center in Atlanta, a nationally renowned traumatic brain injury (TBI) and Spinal Cord center. The Commission on the Accreditation of Rehabilitation Facilities (CARF) notes 15 accredited medical in-patient rehabilitation centers in Georgia. Rehabilitation providers did not participate in the site visit, and little information was available to the SVT regarding the rehabilitation phase of care.

The rehabilitation phase of care is not integrated into the current trauma network, but rehabilitation services are accessed on a case-by-case basis by the trauma centers. No specific standards, guidelines, or transfer agreements for rehabilitation care were reported. Minimum requirements and qualifications for rehabilitation centers have not been established by the trauma system.

Barriers to the transfer of injured patients from trauma centers to rehabilitation facilities include limited access for the underinsured/uninsured patients, inconsistent policies and procedures for transfer, and limited access to long-term acute care facilities for pediatric patients between the age of 15 and 18 years. The prolonged waiting period for Medicaid approval was also noted.

RECOMMENDATIONS

- Perform a comprehensive resource/ needs assessment of rehabilitation services for trauma patients, especially for traumatic brain injuries, spinal cord injuries, and pediatric patients.
- Recruit representatives from the Shepherd Center to provide rehabilitation clinical expertise on all trauma advisory and policy setting groups.
- Analyze trauma patient flow and discharge patterns to rehabilitation, long-term assisted care, and skilled nursing facilities using data from the state trauma registry.
- Include the rehabilitation phase of care in a systemwide performance improvement process using appropriate indicators and benchmarks.

Disaster Preparedness

Purpose and Rationale

As critically important resources for state, regional, and local responses to MCIs, the trauma system and its trauma centers are central to disaster preparedness. Trauma system leaders need to be actively involved in public health preparedness planning to ensure that trauma system resources are integrated into the state, regional, and local disaster response plans. Acute care facilities (sometimes including one or more trauma centers) within an affected community are the first line of response to an MCI. However, an MCI may result in more casualties than the local acute care facilities can handle, requiring the activation of a larger emergency response plan with support provided by state and regional assets.

For this reason, the trauma system and its trauma centers must conduct a resource assessment of its surge capacity to respond to MCIs. The resource assessment should build on and be coupled to a hazard vulnerability analysis. An assessment of the trauma system's response to simulated incident or tabletop drills must be conducted to determine the trauma system's ability to respond to MCIs. Following these assessments, a gap analysis should be conducted to develop statewide MCI response resource standards. This information is essential for the development of an emergency management plan that includes the trauma system.

Planning and integration of the trauma system with plans of related systems (public health, EMS, and emergency management) are important because of the extensive impact disasters have on the trauma system and the value of the trauma system in providing care. Relationships and working cooperation between the trauma system and public health, EMS, and emergency management agencies support the provision of assets that enable a more rapid and organized disaster response when an event occurs. For example, the EMS emergency preparedness plan needs to include the distribution of severely injured patients to trauma centers, when possible, to make optimal use of trauma center resources. This plan could optimize triage through directing less severely injured patients to lower level trauma centers or nondesignated facilities, thus allowing resources in trauma centers to be spared for patients with the most severe injuries. In addition, the trauma system and its trauma centers will be targeted to receive additional resources (personnel, equipment, and supplies) during major MCIs.

Mass casualty events and disasters are chaotic, and only with planning and drills will a more organized response be possible. Simulation or tabletop drills provide an opportunity to test the emergency preparedness response plans for the trauma system and other systems and to train the teams that will respond.

Exercises must be jointly conducted with other agencies to ensure that all aspects of the response plan have the trauma system integrated.

OPTIMAL ELEMENTS

I. An assessment of the trauma system's emergency preparedness has been completed, including coordination with the public health agency, EMS system, and the emergency management agency. **(B-104)**

a. There is a resource assessment of the trauma system's ability to expand its capacity to respond to MCIs in an all-hazards approach. **(I-104.1)**

b. There has been a consultation by external experts to assist in identifying current status and needs of the trauma system to be able to respond to MCIs. **(I-104.2)**

c. The trauma system has completed a gap analysis based on the resource assessment for trauma emergency preparedness. **(I-104.3)**

II. The lead agency ensures that its trauma system plan is integrated with, and complementary to, the comprehensive mass casualty plan for natural and manmade incidents, including an all-hazards approach to planning and operations. **(B-305)**

a. The EMS, the trauma system, and the all-hazards medical response system have operational trauma and all-hazards response plans and have established an ongoing cooperative working relationship to ensure trauma system readiness for all-hazards events. **(I-305.1)**

b. All-hazards events routinely include situations involving natural (for example, earthquake), unintentional (for example, school bus crash), and intentional (for example, terrorist explosion) trauma-producing events that test the expanded response capabilities and surge capacity of the trauma system. **(I-305-2)**

c. The trauma system, through the lead agency, has access to additional equipment, materials, and personnel for large-scale traumatic events. **(I-305.3)**

CURRENT STATUS

The Office of Preparedness within the Division of Public Health shares its leadership/ director with the OEMS/T. This provides significant opportunity for integration between these offices. Unfortunately, the lack of personnel in the OEMS/T trauma section limits the participation of the trauma program at emergency preparedness meetings.

The stakeholders recognized the importance of preparedness, particularly as it relates to hurricane response planning. More than 300 (mostly tabletop) disaster drills have been conducted during the last 6 months.

EMS providers have been encouraged to obtain National Incident Management System (NIMS) approved courses (IS 700, ICS 100 and ICS 200) since 2005. Continuing medical education (CME) credits are provided when on-line and classroom courses are completed, and these CME credits can be used for recertification requirements. It is not known if all EMS providers have obtained this training as the OEMS/T has had significant delays in completing the review of EMS providers to ensure that they have completed required continuing education.

Reviews of surge capacity have been performed, but these have not been specific to trauma. A statewide system that can track real-time surge capacity has been developed, but this online system has a 1-hour delay limiting its utility for EMS when moving patients acutely from the scene of a multi-casualty incident.

A comprehensive gap analysis of preparedness capability of the EMS system was available to the reviewers in draft form. The 2008 Georgia Emergency Medical Services Strategic Resource Plan (draft dated August 2008) is comprehensive, was completed with significant stakeholder input, and it appears to have been very well done. The next step is to fill the gaps that were identified by this process.

RECOMMENDATIONS

- **Focus disaster training and preparedness initiatives on programs that can be integrated into daily and routine use.**
- Develop methods to provide introductory and basic level all-hazards disaster training courses for all EMS personnel, using methods that are readily available to them.
- Ensure that all emergency healthcare providers have received introductory and basic level all-hazards disaster training consistent with National Incident Management System (NIMS) guidelines.
- Ensure the interoperability of EMS disaster communication equipment at the regional and state level with the goal of ensuring universal ability to communicate, with redundancy, statewide.

System-wide Evaluation and Quality Assurance

Purpose and Rationale

The trauma lead agency has responsibility for instituting processes to evaluate the performance of all aspects of the trauma system. Key aspects of system-wide effectiveness include the outcomes of population based injury prevention initiatives, access to care, as well as the availability of services, the quality of services provided within the trauma care continuum from prehospital and acute care management phases through rehabilitation and community reintegration, and financial impact or cost. Intrinsic to this function is the delineation of valid, objective metrics for the ongoing quality audit of system performance and patient outcomes based on sound benchmarks and available clinical evidence. Trauma management information systems (MISs) must be available to support data collection and analysis.

The lead agency should establish forums that promote inclusive multidisciplinary and multiagency review of cases, events, concerns, regulatory issues, policies, procedures, and standards that pertain to the trauma system. The evaluation of system effectiveness must take into account the integration of these various components of the trauma care continuum and review how well personnel, agencies, and facilities perform together to achieve the desired goals and objectives. Results of customer satisfaction (patient, provider, and facility) appraisals and data indicative of community and population needs should be considered in strategic planning for system development. System improvements derived through evaluation and quality assurance activities may encompass enhancements in technology, legislative or regulatory infrastructure, clinical care, and critical resource availability.

To promote participation and sustainability, the lead agency should associate accountability for achieving defined goals and trauma system performance indicators with meaningful incentives that will act to cement the support of key constituents in the health care community and general population. For example, the costs and benefits of the trauma system as they relate to reducing mortality or decreasing years of productive life lost may make the value of promoting trauma system development more tangible. A facility that achieves trauma center verification/designation may be rewarded with monetary compensation (for example, ability to bill for trauma activation fees) and the ability to serve as a receiving center for trauma patients. The trauma lead agency should promote ongoing dialog with key stakeholders to ensure that incentives remain aligned with system needs.

OPTIMAL ELEMENTS

I. The trauma MIS is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system, including a cost-benefit analysis. **(B-301)**

a. The lead trauma authority ensures that each member hospital of the trauma system collects and uses patient data, as well as provider data, to assess system performance and to improve quality of care. Assessment data are routinely submitted to the lead trauma authority. **(I-301.1)**

II. The jurisdictional lead agency, in cooperation with other agencies and organizations, uses analytic tools to monitor the performance of population based prevention and trauma care services. **(B-304)**

III. The financial aspects of the trauma system are integrated into the overall performance improvement system to ensure ongoing fine tuning and cost-effectiveness. **(B-309)**

a. Financial data are combined with other cost, outcome, or surrogate measures, for example, years of potential life lost, quality-adjusted life years, and disability adjusted life years; length of stay; length of intensive care unit stay; number of ventilator days; and others, to estimate and track true system costs and cost- benefits. **(I-309.4)**

CURRENT STATUS

Trauma system registry data are currently collected from all designated trauma centers by the OEMS/T. Data from 2003 were used in the report, *Trauma in Georgia*, to provide an analysis of aggregate demographic variables such as age and mechanism of injury, as well as information such as individual trauma center volume. Financial data from the trauma centers was shared in the June 2008 report on *Allocation of Trauma System Funding* commissioned by the GTCNC. No analysis has yet been conducted of additional state trauma registry fields to yield information on trauma system process and functionality.

The most active multiagency trauma-related performance improvement (PI) activities are being conducted by the trauma coordinators and registrars. These leaders meet regularly and work on particular PI-focused issues, sharing information gleaned from the activities in their own trauma centers as part of a learning process. Meetings are attended by OEMS/T staff.

Local EMS agencies appear to understand and accept the need for PI activities. However, in some areas the dearth of resources leaves little or no time for such efforts. No statewide requirement for EMS PI activities currently exist. Some of the trauma centers are conducting outreach to EMS, providing feedback on

patient outcome. Many trauma coordinators attend Regional EMS Council meetings.

Specific quality of care related issues are referred to the local level for resolution. The OEMS/T trauma center designation program requirements include performance improvement criteria. Trauma center PI programs are reviewed as OEMS/T staff resources allow during the designation, re-designation process. OEMS/T reported anecdotal PI activities if issues were identified during the trauma center data up-load and validation processes.

Specific trauma system process indicators identified by the stakeholders as important to review include the following: appropriate destination, severity of injury of non-trauma system patients, and appropriate interfacility transfer accomplished in a timely manner.

RECOMMENDATIONS

- **Develop and implement statewide and regional trauma system performance improvement plans.**
- Seek legislated protection for trauma system peer review activities.
- Train key trauma system leaders about systems performance improvement processes.
- Identify key aspects of the trauma system process which the stakeholders wish to monitor, such as time of injury to definitive care, over and under triage rates, and diversion time.
- Develop resources to use existing trauma registry and population-based data sources to monitor system performance metrics.
- Develop a mechanism for obtaining information on the injured patients who are currently treated outside the trauma centers.
- Seek assistance from such programs as the National EMS Information System Technical Assistance Center or the National Emergency Medical Services for Children Data Analysis Resource Center to develop data analysis support for performance improvement activities.
- Encourage trauma centers to build outreach forums within their EMS Regions to conduct case reviews with smaller hospitals and prehospital providers.

Trauma Management Information Systems

Purpose and Rationale

Hospital-based trauma registries developed from the idea that aggregating data from similar cases may reveal variations in care and ultimately result in a better understanding of the underlying injury and its treatment. Hospital-based registries have proven very effective in improving trauma care within an institution but provide limited information regarding how interactions with other phases of health care influence the outcome of an injured patient. To address this limitation, data from hospital-based registries should be collated into a regional registry and linked such that data from all phases of care (prehospital, hospital, and rehabilitation) are accessible in 1 data set. When possible, these data should be further linked to law enforcement, crash incident reports, ED records, administrative discharge data, medical examiner records, vital statistics data (death certificates), and financial data. The information system should be designed to provide system-wide data that allow and facilitate evaluation of the structure, process, and outcomes of the entire system; all phases of care; and their interactions. This information should be used to develop, implement, and influence public policy.

The lead agency should maintain oversight of the information system. In doing so, it must define the roles and responsibilities for agencies and institutions regarding data collection and outline processes to evaluate the quality, timeliness, and completeness of data. There must be some means to ensure patient and provider confidentiality is in keeping with federal regulations. The agency must also develop policies and procedures to facilitate and encourage injury surveillance and trauma care research using data derived from the trauma MIS. There are key features of regional trauma MISs that enhance their usefulness as a means to evaluate the quality of care provided within a system. Patient information collected within the management system must be standardized to ensure that noted variations in care can be characterized in a similar manner across differing geographic regions, facilities, and EMS agencies. The composition of patients and injuries included in local registries (inclusion criteria) should be consistent across centers, allowing for the evaluation of processes and outcomes among similar patient groups. Many regions limit their information systems to trauma centers. However, the optimal approach is to collect data from all acute care facilities within the region. Limiting required data submission to hospitals designated as trauma centers allows one to evaluate systems issues only among patients transported to appropriate facilities. It is also important to have protocols in place to ensure a uniform approach to data abstraction and collection. Research suggests that if the process of case abstraction is not routinely calibrated, practices used by abstractors begin to drift.

Finally, every effort should be made to conform to national standards defining processes for case acquisition, case definition (that is, inclusion criteria), and registry coding conventions. Two such national standards include the National Highway Traffic Safety Administration's National Emergency Medical Services Information System (NEMSIS), which standardizes EMS data collection, and the American College of Surgeons National Trauma Data Standard, which addresses the standardization of hospital registry data collection. Strictly adhering to national standards markedly increases the value of state trauma MISs by providing national benchmarks and allowing for the use of software solutions that link data sets to enable a review of the entire injury and health care event for an injured patient.

To derive value from the tremendous amount of effort that goes into data collection, it is important that a similar focus address the process of data reporting. Dedicated staff and resources should be available to ensure rapid and consistent reporting of information to vested parties with the authority and vision to prevent injuries and improve the care of patients with injuries. An optimal information reporting process will include standardized reporting tools that allow for the assessment of temporal and/or system changes and a dynamic reporting tool, permitting anyone to tailor specific "views" of the information.

OPTIMAL ELEMENTS

I. There is an established trauma MIS for ongoing injury surveillance and system performance assessment. **(B-102)**

a. There is an established injury surveillance process that can, in part, be used as an MIS performance measure. **(I-102.1)**

b. Injury surveillance is coordinated with statewide and local community health surveillance. **(I-102.2)**

c. There is a process to evaluate the quality, timeliness, completeness, and confidentiality of data. **(I-102.4)**

d. There is an established method of collecting trauma financial data from all health care facilities and trauma agencies, including patient charges and administrative and system costs. **(I-102.5)**

II. The trauma MIS is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system, including a cost-benefit analysis. **(B-301)**

a. The lead trauma authority ensures that each member hospital of the trauma system collects and uses patient data, as well as provider data, to assess system performance and to improve quality of care. Assessment data are routinely submitted to the lead trauma authority. **(I-301.1)**

b. Prehospital care providers collect patient care and administrative data for each episode of care and not only provide these data to the hospital, but also have a mechanism to evaluate the data within their own agency, including monitoring trends and identifying outliers. **(I-301.2)**

c. Trauma registry, ED, prehospital, rehabilitation, and other databases are linked or combined to create a trauma system registry. **(I-301.3)**

d. The lead agency has available for use the latest in computer/technology advances and analytic tools for monitoring injury prevention and control components of the trauma system. There is reporting on the outcome of implemented strategies for injury prevention and control programs within the trauma system. **(I-301.4)**

CURRENT STATUS

The state trauma registry was reported to be one of the strengths of the Georgia trauma system. In 2002, the legislature appropriated approximately $750,000 for the purpose of securing, distributing, and installing a single platform of trauma registry software. All designated trauma centers received the registry software (GTRACS) and began the data collection and transmission processes. The registry software continues to be updated and compliant with the National Trauma Data Standard (NTDS). A standard data dictionary and associated definitions were adopted through the trauma coordinators and registrar's group.

The legislature's continued appropriation of $750,000 is distributed on a contractual basis to the 15 trauma centers to help offset the cost of data collection and submission to the state. This contracting mechanism also serves as an enforcement mechanism since criteria for in-hospital and prehospital PI activities are stated as a condition for payment. The OEMS/T staff noted that as additional trauma centers are recruited and come "on-line" with the trauma registry the amount of the trauma registry fund available for each facility will be reduced. This creates a potential disincentive for existing trauma centers to support the transition from an exclusive trauma center network to an inclusive trauma system.

As the trauma system expands to become more inclusive in nature, it will be essential to capture injury data from all acute care facilities through either a web-based abbreviated trauma registry data entry process or through the extrapolation of essential data from existing data sets such as the Health Care Finance Administration's (HCFA) Uniform Billing form (UB-92/04). This development or translation activity has the potential to further erode the per capita allotment of resources to partially cover the costs of trauma registry activities.

The trauma program has a trauma registrar assigned to ensuring the timely submission of data as a contract compliance measure. The trauma registrar also cleans incoming data as it is transferred to the state trauma registry. Ad hoc reports can then be produced on an as-requested and approved basis. A procedure for requesting those reports and other access to the aggregate trauma registry data does exist. No standardized reports are currently being run.

Data transmission to the National Trauma Data Bank (NTDB) is variable and trauma center dependent. NTDB submission requirements as a criterion for registry funding could be used to increase this submission and, the compiled data from the National Trauma Data Bank could potentially provide another resource for reporting and benchmarking.

In addition to the trauma registry, Georgia has access to multiple data sources that could be used in a more proactive manner to monitor trauma system issues. The GEMSIS has recently come on-line as a NEMSIS-compliant patient care reporting system for prehospital providers. Data entry can be accomplished via several methods, with the lowest common denominator being paper bubble forms that can be scanned. The GEMSIS has been operational for only a few months. The ultimate utility of this data for trauma system management remains unclear, and its usefulness will be partially contingent upon personnel resources to manage and analyze the data. Expertise in data set linkage should be engaged early in the GEMSIS process to identify mechanisms to track patients from the prehospital phase of care through their trauma course of treatment.

Other sources of data include vital records, hospital discharge (UB 92/04), emergency department, highway crash records, child mortality review data, and other miscellaneous sources. While these data are occasionally used for a variety of reports pertaining to injury profiles or injury prevention, they are not routinely explored as a means of trauma system performance improvement. This is due both in part to a lack of staff and a lack of technical abilities to successfully link the various data sets.

Some available data management and analysis resources may be underutilized. For example, access to epidemiologic support both within and outside of the DHR was reported to be available. Additionally, the state has probabilistic and deterministic linkage expertise within the CODES project which is based within the DHR.

RECOMMENDATIONS

- **Use the existing trauma registry data to develop simple benchmarking reports.**
- Measure, over time, changes in the frequency of trauma patients (injury severity score greater than15) who are treated at non-trauma hospitals

through the use of both trauma registry and hospital discharge data (UB92/04) (with ICD9 E code mapping software).

- Consult with the National Emergency Medical Services for Children Data Analysis Resource Center (NEDARC) and the National EMS Information System Technical Assistance Center to establish a mechanism for linkage between Georgia EMS Information System and the Georgia state trauma registry.

- Create a mechanism by which injury treatment data can be gathered from trauma-participating acute care facilities.

Research

Purpose and Rationale

Overview of Research Activity

Trauma systems are remarkably diverse. This diversity is simply a reflection of authorities tailoring the system to meet the needs of the region based on the unique combination of geographic, economic, and population characteristics within their jurisdiction. In addition, trauma systems are not fixed in their organization or operation. The system evolves over years in response to lessons learned, critical review, and changes in population demographics. Given the diversity of organization and the dynamic nature of any particular system, it is valuable when research can be conducted that evaluates the effectiveness of the regional or statewide system. Research drives the system and will provide the foundation for system development and performance improvement. Research findings provide value in defining best practices and might alter system development. Thus, the system should facilitate and encourage trauma-related research through processes designed to make data available to investigators. Competitive grants or contracts made available through lead authorities or constituencies should provide funds to support research activities. All system components should contribute to the research agenda. The extent to which research activities are required should be clearly outlined in the trauma system plan and/or the criteria for trauma center designation.

The sources of data used for research might be institutional and regional trauma registries. As an alternative, population-based research might provide a broader view of trauma care within the region. Primary data collection, although desirable, is expensive but might provide insights into system performance that might not be otherwise available.

Trauma Registry–based Research

Investigators examining trauma systems can use the information recorded in trauma registries to great advantage to determine the prevalence and annual incidence rate of injuries, patterns of care that occur to injured patients in the system’s region, and outcomes for the patients. These data can be compared with standards available from other trauma registries, such as the NTDB. Such comparisons can then enable investigators to determine if care within their region is within standards and can allow for benchmarking. Initiating and sustaining injury prevention initiatives is a vital goal in mature trauma systems. Investigators can take a leadership role in performing research using trauma registry data that identify emerging threats and instituting public health measures to mitigate the threats. For example, a recent surge in death and disability related to off -road vehicles can be identified and the scope of the problem defined in terms of who,

where, and how riders are injured, and then, through presentations and publications, the public can be informed of a new threat.

Trauma system administrators have a responsibility to control investigators' access to the registry. The integrity and reliability of data in a trauma systems registry are essential if accurate research and valid conclusions are to be reached using the data. Trauma system administrators should have a process that screens data entered into the system's composite registry from individual institutions. There should be a mechanism that ensures that the information is stored in a secure manner. Investigators who seek access to the trauma registry must follow a written policy and procedure that includes approval by an authorized institutional review board. Trauma registry data may include unique identifiers, and system administrators must ensure that patient confidentiality is respected, consistent with state and federal regulations.

Population-based Trauma System Research

A major disadvantage of using only trauma registry data to conduct research that evaluates injured patients in a region is the bias resulting from missing data on patients not treated at trauma centers. Specifically, most registry data are restricted to information from hospitals that participate in the trauma system. Although ideally all facilities participate in the form of an inclusive system, many systems do not attain this goal. Thus, a population-based data set provides investigators with the full spectrum of patients, irrespective of whether they have been treated in trauma centers or nondesignated centers or were never admitted to the hospital owing to death at the scene of incident or because their injuries were insufficiently severe to require admission. The state and national hospital discharge databases are examples of population-based data. These discharge databases contain information that was abstracted from medical records for billing purposes by hospital employees who enter these data into an electronic database. For investigators seeking a wider perspective on the care of injured patients in their region, these more inclusive data sets, compared with registries, are essential tools. Other population based data that may be of help include mortality vital statistics data recorded in death certificates. Selected regions might have outpatient data to capture patients who are assessed in the ED and then released.

Investigators can use these population-based data to study the influence of a regional trauma system on the entire spectrum of patients within its catchment area.

Participation in Research Projects and Primary Data Collection

Multi-institutional research projects are important mechanisms for learning new knowledge that can guide the care of injured patients. Investigators within trauma systems can participate as co-investigators in these projects. Investigators can participate by recruiting patients into prospective studies, being leaders in the design and administration of grants, and preparing manuscripts and reports.

Evidence of this collaboration is that investigators within a trauma system are recognized in announcements of grants or awards. Lead agency personnel should identify and reach out to resources within the system with research expertise. These include academic centers and public health agencies.

Measures of Research Activity

Research can be broadly defined as hypothesis-driven data analysis. This analysis leads the investigators to a conclusion, which might become a recommendation for system change. Full manuscripts published in peer reviewed research journals are an exemplary form of research activity. Research reported in annual reviews or in public information formats intended to inform the trauma system's constituency can also be considered legitimate research activity.

OPTIMAL ELEMENTS

I. The trauma MIS is used to facilitate ongoing assessment and assurance of system performance and outcomes and provides a basis for continuously improving the trauma system, including a cost-benefit analysis. **(B-301)**

a. The lead agency has available for use the latest in computer/technology advances and analytic tools for monitoring injury prevention and control components of the trauma system. There is reporting on the outcome of implemented strategies for injury prevention and control programs within the trauma system. **(I-301.4)**

II. The lead agency ensures that the trauma system demonstrates prevention and medical outreach activities within its defined service area. **(B-306)**

a. The trauma system has developed mechanisms to engage the general medical community and other system participants in their research findings and performance improvement efforts. **(I-306.1)**

b. The effect or impact of outreach programs (medical community training/support and prevention activities) is evaluated as part of a system performance improvement process. **(I-306.3)**

III. To maintain its state, regional, or local designation, each hospital will continually work to improve the trauma care as measured by patient outcomes. **(B-307)**

a. The trauma system implements and regularly reviews a standardized report on patient care outcomes as measured against national norms. **(I-307.2)**

CURRENT STATUS

It was reported that a significant amount of research is being conducted within the level I and level II trauma centers and their affiliated academic institutions. Both clinical and bench research is being conducted. Systems research has rarely been conducted. One example was a study of injury patterns during holidays. A major study with international implications related to the treatment of traumatic brain injury was also mentioned.

Recently, discussion was initiated about interfacility collaboration to identify and examine various aspects of trauma care in Georgia. This effort could serve as the beginning of a process to identify a trauma research agenda for the state.

The possibility (grant application currently under review) of securing a CDC funded Injury Control Research Center could provide opportunities for additional focused injury control research. Strong schools of public health and the CDC are available to assist with epidemiological and statistical support.

RECOMMENDATIONS

- Establish a Georgia trauma system research committee to develop a research agenda and to advise the lead agency on requests for trauma registry data.
- Form a multi-institutional group to conduct system research.
- Work with epidemiological resources to conduct population-based research.
- Report research findings at the Trauma Associates of Georgia-sponsored state trauma conference to help translate research into practice.
- Disseminate research findings as appropriate to influence trauma structure, process, and outcomes.

Focus Question 1:

What trauma capacity does Georgia need? How does Georgia rate?

Response: Cannot be determined at this time

Benchmarks for determining appropriate trauma capacity are not currently well defined by any state or organization. Even the definition of “capacity” is unclear. One approach would be to establish the goal of getting the “right patient to the right facility in the right time,” and follow this by an assessment of the existing situation in Georgia using population-based data (UB 92/04) and the statewide trauma registry data.

Several challenges related to trauma center capacity were reported by stakeholders:

- Level I, and possibly level II trauma centers are currently functioning at or beyond capacity, primarily related to ICU bed availability and healthcare personnel shortages.
- The EMS system was likewise noted to be “resource challenged”, especially in more rural areas of Georgia.
- The directors of several level I trauma centers reported that a percentage of trauma patients (poorly defined at this time) transferred to their centers had isolated or less severe injuries that could potentially be managed in selected local acute care facilities in an inclusive trauma system.

All of the Georgia acute care facilities capable of achieving level I trauma center status currently appear to have been designated. Some additional facilities capable of achieving level II trauma center status may exist. A number of acute care facilities throughout the state are capable of achieving level III or IV trauma center designation. No data were provided regarding the number of injured Georgians treated in neighboring state trauma centers.

In an inclusive system, every acute care facility has a role, which at a minimum should include rapid assessment, stabilization, and transfer of injured patients to a predetermined regional trauma center, as well as the submission of data on those patients to the trauma registry. This could be a participating trauma hospital or designation at level IV. The stakeholders reported that approximately 70% of trauma patients in Georgia are not cared for in trauma centers, but no data were provided to assist the Site Visit Team in determining how many of those patients suffered injuries that should have been cared for in a level I or II trauma center.

Only limited national benchmarks (through the NTDB) exist to determine how Georgia rates at the present time. However, to use these national benchmarks,

all the Georgia trauma centers must submit high quality data to the NTDB on a regular basis.

Unless and until sufficient personnel resources can be identified to fully analyze both focused (trauma registry) and population-based (UB 92/04) data it will remain unclear how many and where additional level II (and potentially level III) trauma centers are needed. In the interim, the development of an inclusive system will make it possible for all critically injured patients to be triaged, stabilized, and transferred to a trauma center in a more timely manner.

RECOMMENDATIONS

- Add a provision to the contracts with trauma centers requiring annual submission of data to the National Trauma Data Bank.
- Encourage trauma centers to share information about how their trauma center compares with national benchmarks.
- Approach the National Trauma Data Bank to request a state summary report of trauma data, with comparison of aggregate Georgia level I and level II trauma centers to national benchmarks.
- Obtain the services of an epidemiologist to investigate the hospital discharge dataset for trauma patients, their severity of injury, and location of trauma care. Track the transfer of patients between acute care facilities to identify those with serious injuries who are and are not transferred appropriately.
- Contact neighboring state trauma managers to obtain information about the number of severely injured Georgians transferred to and treated in their trauma centers.

Focus Question 2:

Is state office infrastructure adequate to support a trauma system and future growth?

The SVT, after reviewing and analyzing the provided documentation and testimony from OEMS/T employees and stakeholders, have concluded that the OEMS/T as currently staffed cannot sustain current trauma system administrative functions, and has no resources for development efforts. This personnel and resource shortage will become increasingly more challenging as efforts are made to implement recommendations contained in this report and additional trauma centers are recruited into the system.

With no trauma center designation coordinator or dedicated administrative support, the trauma program manager is forced to spend most of her time on these activities instead of on system enhancements. She has little or no time to support the development of policies and procedures, system PI, or regionalization of trauma care. An analysis of personnel positions in the trauma offices of states similar in size to Georgia will be informative as you implement the recommendations contained in this report.

Data from the state trauma registry and GEMSIS must be used to help guide the future trauma system development. While the state trauma registrar can manage and evaluate the current volume of data that is submitted to the trauma registry, that data has no value unless it can be analyzed and used to inform the system, and the same is true for GEMSIS. The trauma program currently has no consultant or staff member to perform data analysis. In the absence of dedicated epidemiologic or data analysis support, the trauma program must seek outside assistance, either from other sections of state government or from outside sources such as schools of public health.

The EMS program is similarly weakened, but more because of position vacancies and hiring freezes.

The Office of Preparedness Director, while listed as the State EMS Medical Director, must fulfill the executive functions associated with four programs. As such, he does not have adequate time to fulfill needed state oversight of EMS and trauma care by EMS providers. This contributes to variability in issues of prehospital care processes across Georgia.

With the passage of SB 60, the trauma program has taken on additional responsibilities and, as of yet, has received no financial support for its work. The GTCNC is expected to work through the OEMS/T to accomplish its responsibilities. For example, because of its existing contractual relationships, the OEMS/T was expected to facilitate the distribution of the one-time funds to hospitals, physicians, and EMS agencies. The trauma program manager also

was given the responsibility of coordinating the ACS trauma system consultation and completing the pre-review questionnaire, even though the GTCNC commissioned the consultation. These additional tasks, completed without additional support, impeded the ability of the trauma manager to perform expected responsibilities associated with monitoring trauma center activities.

The creation of the GTCNC has resulted in an unclear bifurcation of responsibilities for trauma system development, essentially leaving Georgia without a clearly defined or responsible lead agency. In addition, the GTCNC is not presently assigned to a state agency, and it needs access to a state agency's resources to complete its assigned work (e.g., promulgate rules and regulations for the trauma transportation system, and pursue contracts with existing state transportation structures or existing transportation organizations). The GTCNC is to coordinate its activities with the DHR, presumably with the trauma program in the Office of Preparedness. Rules and regulations will need to be submitted for review in the DHR, and these will most likely need to be shepherded by the trauma program.

The current statute for the GTCNC does not describe a responsibility for the implementation of the rules and regulations that are approved for trauma system development. A strong trauma program office within the state agency with adequate staffing is needed for the GTCNC to be successful in its mission. Additionally, if the dual agency approach continues, a clear description of duties, responsibilities, and lines of authority between the agencies is essential to the goal of protecting the health and welfare of injured Georgians.

Finally, it is imperative that during this period, when the Legislature and Governor have a high interest in trauma system development, that a strategic analysis be performed to ensure that a dedicated and protected funding stream be identified which assures that the lead agency have sufficient personnel, infrastructure, and support services in order to implement a comprehensive, inclusive trauma system.

RECOMMENDATIONS

- Maintain the current full time trauma program manager and trauma registrar.
- Increase the number of permanent positions within the state trauma program as soon as possible to include at a minimum:
    - Trauma medical director or advisor (part time) with a primary focus of medical oversight of the trauma program.
    - Trauma Center Designation Coordinator (full time).
    - Associate trauma program manager (full time), within the next 1 to 2 years.

  - Epidemiologist/ trauma data analyst (part time)
  - Administrative support staff (full time)
- Clarify the relationship between the GTCNC and the state trauma program, and clearly define the roles of each with regard to trauma system development to facilitate an effective collaborative relationship.

Recommendations found elsewhere in the report that relate to this question include the following:

- Appoint a state EMS medical director who has medical oversight of the EMS system as that individual's primary focus.
- Seek legislative changes to OCGA 31-11, Article 5 regarding the cost of readiness support to trauma centers and EMS, and clarify that the lead agency funding allotments must be payable before other funds are distributed.

Focus Question 3:

Review and comment on SB 60.

CURRENT STATUS

The trauma stakeholders are to be commended for educating the Georgia Legislature about the importance of improving the state's trauma system. The recent funding and SB 60 (now OBGA 31-11-article 5) is a testament to their efforts. While this legislation has many benefits, it has created confusion regarding the roles of the GTCNC and the OEMS/T.

The SVT heard comments from OEMS/T staff members and stakeholders about their fear of openly discussing suggestions that may differ from the perceived opinions of the GTCNC members who are political appointees or who have government leadership appointments. In addition, the GTCNC is not appropriately structured to provide the administrative functions that are necessary to establish an inclusive and integrated trauma system (e.g. trauma center designation, trauma registry maintenance, etc.).

To facilitate smooth operation of the administrative function and to facilitate open sharing of opinions and concerns among stakeholders, GTCNC members, and lead agency employees, there must be further clarification of the distinct roles of these groups. A single lead agency must emerge.

Several of the recommendations from other sections of this report are related to clearly identifying a lead agency, and the state should make this decision based upon a thorough review of the issues. Although there are several potential models, the OEMS/T is currently the most aligned with the functions of a lead agency for management of the trauma system. However, the trauma program is at such a low level within the DHR infrastructure, that stakeholders are given the impression that the trauma program is unresponsive.

RECOMMENDATIONS

- Use various recommendations contained in this report to clarify the operational roles for the GTCNC and the trauma program to prevent confusion, and to promote effective collaboration. One potential model is:
    - Restructure the GTCNC to act as an oversight body with formal committees of stakeholders to devise and subsequently review/ refine the State Trauma Plan, develop rules and regulations, use the State Trauma Plan to set priorities, and oversee the disbursement of trauma

funding that is not used for administration of the lead agency administrative trauma roles.

- Designate the OEMS/T as the lead agency with the primary responsibility for administering the operational aspects of the trauma system (e.g., implementing rules and regulations, administering the trauma center designation process, managing the state trauma registry, and working with the regional EMS councils and advisory groups).

Recommendations found elsewhere in the report that relate to this question include the following:

- Recommend to the legislature that they enact broad enabling legislation that includes the following elements: assign a lead agency; define the lead agency's role in the development, oversight, and monitoring of the system; and allow for the development of rules, regulations, policy, and procedures.
- Define clearly in statute, rule, or policy the relationship between OEMS/T and GTCNC along with reporting and accountability mechanisms.
- Reconstitute a clear lead agency for trauma system development and implementation that has more permanence, with necessary reporting relationships to facilitate policy development, implementation, and daily operations.
    - Functionally, a close linkage with the office of EMS seems essential.
- Restructure the operations of the OEMS/T within state government to reduce the levels of approval that are necessary to reduce the time from policy development to approval and implementation.
    - During the restructuring, consider renaming OEMS/T to the Office of Emergency Care, integrating time sensitive diseases (e.g., STEMI, stroke, asthma), under one umbrella and eliminate one layer of bureaucracy
- Perform a strategic analysis to assess the optimal lead agency structure and position within Georgia's state government.
- Conduct an analysis of the current OEMS/T legislative authority for the trauma program, utilizing appropriate governmental resources, (e.g., the Office of the Attorney General) to identify legislative needs.

Focus Question 4:

Assess trauma rules and regulations and lack of legislation regarding trauma.

CURRENT STATUS

Current rules related to the trauma system include only Section 290-5-30-.06, which addresses the following:

- prohibits non-designated hospitals from marketing themselves as trauma centers,
- gives authority to the OEMS/T to review, enforce, and recommend removal of trauma center designation, and
- directs the OEMS/T to define in policy the trauma center designation and redesignation process.

The details of the trauma center designation process are found in policy PRO-L-07 rather than in rule or regulation.

Section 290-5-30-.05 gives the Regional EMS Councils the role of making recommendations for the designation of trauma centers and to serve in an advisory capacity to the DHR. Section 290-5-30-.18 provides for revocation of trauma center designation.

The enabling legislation for the development of the trauma system was identified as being within O.C.G.A § 31-11. This law contains no readily visible broad authority to develop a trauma system. While the Georgia Trauma Care Network Commission (GTCNC) is given the authority to promulgate rules and regulations pertaining to a trauma transportation system, they are not given either the responsibility or the authority to develop a comprehensive, integrated, and inclusive trauma system. In addition, the relationship between the GTCNC and the DHR OEMS/T is not clearly stated.

Injury, the leading cause of death in the young, is a public health problem. It has become clear to trauma experts that a public health approach to the development of an inclusive and integrated system is essential for ensuring that the health of the public is protected, particularly in more remote and rural regions. These evolutions in trauma system development are not reflected in the current statutory language which focuses primarily on trauma centers and systems for delivery of compensation.

When queried about statutes that protect the confidentiality of either the systemwide PI processes or state level trauma registry data, participants were uncertain of the level of protection from discoverability, if any. Without trust, agencies and their representatives will be hesitant to participate fully in the PI

process. Trust cannot exist without the support of legal protection from discoverability for discussions that may ensue at some point in the evolution of the PI program. True sharing of experiences for learning purposes involves a case review format and candid identification of opportunities for improvement in the context of a protected forum such as the Medical Audit Committee format. This allows the lessons learned in one facility to be shared through education with others in the trauma system. This valuable component of a trauma system PI process needs strong confidentiality protection in order for trauma providers to be willing to fully participate. The protection should extend to the EMS community so that trauma centers can also provide educational case reviews for these providers.

The OEMS/T reports a consistent approach to the trauma center designation process, but allows some flexibility in requirements related to less critical criteria Exceptions, variations, and waivers related to these less critical criteria were reported by OEMS/T and the current trauma centers. The SVT was unable to determine if these variances, exceptions, and waivers are applied on a consistent basis, or are ad hoc in nature. Several options to address this are possible:

- Revise the statute to require the verification of level I and II trauma centers by the ACS Committee on Trauma Hospital Verification Review program. This would remove the OEMS/T from the middle where they may feel pressured to make exceptions requested by various trauma centers.
- Revise the policy regarding trauma center designation guidelines to modify criteria for level I and II trauma centers. Maintain essential patient care criteria and require all trauma centers to meet these criteria for designation.
- Retain the current policy for trauma center designation and allow no further waivers, variances, or exceptions.

Contract administration regarding the capture and submission of trauma registry data is a significant effort. If the data are received by OEMS/T, but technical issues regarding submitted data are identified, the invoice is paid while resolving these issues. If the trauma center has not submitted the data, no funds are paid. The reporting requirements of these contracts and resolution of technical issues present a large workload for the OEMS/T staff that impacts their ability to use trauma registry data for meaningful reports and the PI activities.

EMS standards are, likewise, not uniformly applied in accordance with rule or policy. For instance, it was noted that emergency medical personnel due to recertify more than a year ago have not yet been formally re-credentialed due to a backlog in record review, exacerbated by large number of vacancies within the EMS program office. With the implementation of the air medical services regulations, the workload will further increase.

It was noted by participants that recent challenges have identified a flaw in the emergency medical services (EMS) statute. At the local level, municipalities and counties have no specific requirement to ensure that community residents have access to EMS, unlike the requirement that ensures community fire and law enforcement services. This deficiency needs to be addressed to assure EMS access by all state residents.

RECOMMENDATIONS

- Identify and resolve personnel and fiscal gaps in the OEMS/T that contribute to an inability to adhere to policies in a uniform and consistent manner.
- Seek the approval of policies, rules, and regulations in a timely manner at the Department of Human Resources level.
- Establish a trauma designation process that does not permit exceptions, variances, or waivers related to essential trauma center criteria. Alternatively, investigate the efficacy of using the American College of Surgeons Committee on Trauma Hospital Verification Review Process for the designation and redesignation of level I and level II trauma centers.

Recommendations found elsewhere in the report that relate to this question include the following:

- Conduct an analysis of the current OEMS/T legislative authority for the trauma program, and use appropriate governmental resources, (e.g., the Office of the Attorney General) to identify legislative needs.
- Recommend to the State Legislature that they enact broad enabling legislation for the trauma system that includes the following elements: assign a lead agency; define the lead agency's role in the development, oversight, and monitoring of the system; and allow for the development and approval of rules, regulations, policy, and procedures.
- Define clearly in statute, rule, or policy the relationship between OEMS/T and GTCNC along with reporting and accountability mechanisms.
- Ensure that the EMS and trauma system data and system performance improvement processes are fully protected from discoverability.
- Move the primary authority for the development and implementation of EMS policy and protocols from the local to the regional level (State responsible with opportunity for regional adaptation approved by state).
- Seek legislative changes to OCGA 31-11, Article 5 that continue the cost of readiness support to trauma centers, healthcare providers, and EMS, and clarify that the lead agency funding allotments must be payable before other funds are distributed.

- Identify a process and timetable for the review, revision, and update of all trauma statute, rules, regulations, and policy to ensure their continued appropriateness and applicability.
- Assign the responsibility for ensuring access to EMS within any geographic area of Georgia to a specific unit of government, e.g. county or municipality.

Acronyms Used in the Report

ACS – American College of Surgeons
ALS – advanced life support
ATLS – Advanced Trauma Life Support program

BIS – Benchmarks, Indicators, and Scoring

CAMTS – Commission on Accreditation of Medical Transport Services
CARF – Commission on the Accreditation of Rehabilitation Facilities
CDC – Centers for Disease Control and Prevention
CME – Continuing medical education
CODES – Crash Outcome Data Evaluation System

DHR – Department of Human Resources

EMS – emergency medical services
EMT – emergency medical technician

FTE – full time equivalent

GEMSIS – Georgia EMS Information System
GOHS – Governor's Office of Highway Safety
GSTAT – Georgia State Trauma Action Team
GTCNC – Georgia Trauma Care Network Commission
GTRACS – Georgia state trauma registry software program

HCFA – Health Care Finance Administration
HRSA – Health Resources and Services Administration

ICS – Incident Command System
ICU – intensive care unit

MTSPE – Model Trauma Systems Planning and Evaluation

NEDARC – National EMSC Data Analysis Resource Center
NEMSIS – National EMS Information System
NHTSA – National Highway Traffic Safety Administration
NIMS – National Incident Management System
NTDB – National Trauma Data Bank
NTDS – National Trauma Data Standard

OCGA – Official Code of Georgia
OEMS/T – Office of Emergency Medical Services and Trauma

PI – performance improvement
PRQ – pre-review questionnaire

SADD – Students Against Destructive Decisions
SVT – site visit team

TAG – Trauma Associates of Georgia
TSDC – Trauma System Development Committee

Appendix A: Site Visit Team Biographical Sketches

ROBERT J. WINCHELL, MD, FACS- TEAM LEADER

Dr. Robert Winchell is currently the head of the Division of Trauma and Burn Surgery at the Maine Medical Center and Associate Clinical Professor of Surgery at the University of Vermont School of Medicine. Dr. Winchell received his undergraduate degree from the California Institute of Technology and his M.D. from Yale University. He did his internship, General Surgery residency, and Trauma and Critical Care Fellowship at the University of California, San Diego, where he remained on the faculty as Associate Professor of Clinical Surgery in the Division of Trauma through 1999. After leaving the University of California, Dr. Winchell established and subsequently directed the Tacoma Trauma Center in Tacoma, Washington, a successful new trauma center operated as a joint venture between two previously competing hospitals. Dr. Winchell moved to the Maine Medical Center in 2001 and assumed his current post in 2004.

Dr. Winchell has been involved in trauma center and trauma system design and operation throughout his career, in a wide variety of settings covering the spectrum of system development. He was involved with both the day-to-day operations and ongoing development of the San Diego County trauma system for over ten years and served as chair of the San Diego and Imperial County Committee on Trauma. He participated in operation and ongoing development of the Washington state trauma system, serving on the state advisory board, and as chair of the Southwest EMS region. Since coming to Maine, Dr. Winchell has worked to develop the Maine state system, is a member of the state advisory board, and is currently the chairman of the Maine State Committee on Trauma. Dr. Winchell is an active member of the Trauma Systems Evaluation and Planning Committee of the American College of Surgeons and also serves as a site reviewer for the trauma center verification program of the College.

Dr. Winchell is Board certified in General Surgery, with added qualifications in Surgical Critical Care. Dr. Winchell is a Fellow of the American College of Surgeons as well as a member of the American Association for the Surgery of Trauma, the Association for Academic Surgery, the Southwest Surgical Congress, and the Society of Critical Care Medicine. He is author of more than 40 scientific papers and book chapters, and has given over 100 regional, national, and international presentations.

JANE W. BALL, RN, DRPH

Dr. Jane W. Ball served as the Director of the National Resource Center (NRC) at the Children's National Medical Center in Washington, D.C. from 1991 through 2006. The NRC provided support to two Federal Programs in the U. S. Department of Health and Human Services' Health Services and Resources Administration (HRSA): the Emergency Medical Services for Children (EMSC) Program and the Trauma-Emergency Medical Services Systems Program. As director of the NRC, she coordinated the support provided to the Federal Program Directors as well as the provision of technical assistance to state

grantees. Support to the Federal Program Directors often included meeting facilitation, preparation of special reports (such as the *Model Trauma Systems Evaluation and Planning* document), and consultation on Program issues. Technical assistance often included strategic planning, providing guidance in securing funding, developing and implementing grants, developing injury prevention plans and programs, building coalitions, shaping public policy, conducting training, and producing educational resource materials.

Dr. Ball has authored numerous articles and publications as well as several health care textbooks, including Mosby's Guide to Physical Examination (7 editions), Child Health Nursing (2 editions), Pediatric Nursing: Caring for Children (4 editions), Maternal and Child Nursing (2 editions), and Pediatric Emergencies: A Manual for Prehospital Care Providers (2 editions). One of these texts, Pediatric Nursing: Caring for Children, received the1999 and 2001 Robert Wood Johnson Foundation Last Acts Coalition Outstanding Specialty Book Award. As an expert in the emergency care of children, Dr. Ball has frequently been invited to join committees and professional groups that address the unique needs of children.

Dr. Ball recently completed her term as the President and Immediate Past President of the National Academies of Practice, an organization composed of distinguished health care practitioners from 10 disciplines that promote education, research, and public policy related to improving the quality of health care for all through interdisciplinary care.

Dr. Ball graduated from the Johns Hopkins Hospital School of Nursing. She obtained her master's degree and doctorate in Public Health from John Hopkins University School of Hygiene and Public Health. She is a Certified Pediatric Nurse Practitioner.

MARY SUE JONES, RN, MS

Mary Sue Jones has been Delaware's State Trauma Coordinator since 1996 and was the Associate Trauma System Coordinator for 2 years prior. Delaware has had an inclusive Trauma System since 2000. Mary Sue was Trauma Coordinator at a Pennsylvania Level II Trauma Center for 4 years, during the implementation period of the Pennsylvania Trauma System. Prior to that, she spent 5 years in the Admitting Area of Maryland's R. Adams Cowley Shock Trauma Center, and later taught for 3 years in a paramedic educational program. Previous clinical experience includes positions in Surgical Intensive Care as Emergency Department nurse manager and as hospital shift supervisor in hospitals in Baltimore and suburban Washington, D.C. She has served on American College of Surgeons consultation teams since 2004, and represented the State Trauma System Managers on the National Trauma-EMS stakeholders group.

DOUGLAS F. KUPAS, MD, EMT-P, FACEP

Douglas F. Kupas, MD began his career in emergency medical services (EMS) in the early 1980's as an EMT and paramedic in western Pennsylvania. He then completed medical school at Jefferson Medical College of Thomas Jefferson University in Philadelphia, followed by residency training in Emergency Medicine at Geisinger Medical Center in central Pennsylvania – Geisinger is a Level I Trauma Center and a Pediatric Trauma Center serving 31, mostly rural, counties in northcentral/ northeastern Pennsylvania. During his residency, he flew on over 80 air medical transports as a flight physician for Geisinger LifeFlight. After residency, he stayed at Geisinger Medical Center as a faculty member where he served as the program director of the emergency medicine residency from 1998 through 2008. Previous roles at Geisinger included Director of EMS Programs, establishment of the Emergency Medicine Resuscitation Simulation Lab, Chairman of the Disaster Committee, and Chairman of the five-county Inter-facility Disaster Committee. He currently holds the position of Associate Chief Academic Officer for Medical Student and Resident Affairs for Geisinger Health System.

Dr. Kupas has many clinical interests in emergency medicine, including emergency airway management, therapeutic hypothermia and care of accidental hypothermia, simulation in healthcare education, wilderness EMS, and emergency ultrasound. His scholarly interests include prehospital airway management and EMS vehicle safety and crash prevention. He has been a worksheet author for airway care components of the International Liaison Committee on Resuscitation 2005 and 2010 guidelines.

Dr. Kupas has served as the Commonwealth EMS Medical Director for the state of Pennsylvania since 2000. In this role, among many other projects, he has overseen the development and implementation of statewide BLS and ALS protocols in Pennsylvania, developed a state online EMS safety and error reporting system, oversees the state EMS QI plan, and provides consultation to the Director of the Bureau of EMS. He also serves as the ALS Service Medical Director for Danville Ambulance Service.

He has a special interest in rural EMS and trauma systems. He served as chair of the National Association of EMS Physicians (NAEMSP) Rural Affairs Committee, as an advisory council member of the Rural EMS and Trauma Technical Assistance Center, and as the chair of the NAEMSP Standards and Practice Committee. He is currently the chair of the National Association of State EMS Officials Council of Medical Directors.

TERRY MULLINS, MBA

Terry Mullins joined the Arizona Department of Health Services as Chief for the Bureau of Emergency Medical Services and Trauma System in May, 2006. Previously he was employed by Children's National Medical Center in Washington D.C as the manager of the Trauma-EMS Technical Assistance Center, established and maintained via contract with the US Department of Health and Human Services. He was charged with overseeing a national technical assistance center to work directly with the states, the District of Columbia, five freely associated territories, and multiple federal and national stakeholder organizations to enhance trauma and EMS systems.

His EMS background includes six years of management in the ambulance industry and 13 years as a pre-hospital provider. He received his initial EMT certification on San Juan Island, WA and his paramedic certification from Central Washington University in Ellensburg, WA.

Throughout his career, he has filled various positions including Training Officer, QI Officer, and Director of Operations and General Manager. He has served as a member of various committees at the local, state, and national level. He continues to participate in American College of Surgeons and National Highway Traffic Safety Administration statewide assessment teams.

He has been married for 20 years and has three children; ages 14, 12, and 10. A native of Atchison, Kansas, it is common for him to begin conversations with a question about the weather.

NELS D. SANDDAL, MS, REMT-B

Mr. Sanddal is currently the president of the Critical Illness and Trauma Foundation (CIT), in Bozeman, Montana. CIT is a non-profit organization dedicated to improving the outcomes of people who are injured in rural America through programs of prevention, training, and research. He recently completed a detachment as the Director of the Rural EMS and Trauma Technical Assistance Center which was funded by the Department of Health and Human Services, Health Resources and Services Administration. Mr. Sanddal worked as the training coordinator for the EMS and Injury Prevention Section of the Montana Department of Public Health and Human Services in the late 1970's. He has served as the Chairperson of the National Council of State EMS Training Coordinators and as the lead staff member for that organization, as well as the National Association of EMT.

Mr. Sanddal has been a co-investigator for six state or regional rural preventable trauma mortality studies and has conducted research in the area of training for prehospital and nursing personnel as well as in rural injury prevention and control. He is a core faculty member for the NHTSA Development of Trauma Systems course and has conducted several statewide EMS assessments for

NHTSA. Mr. Sanddal served on the IOM Committee on the Future of Emergency Care in the U.S.

He received his EMT training in Boulder, Montana in 1973 and has been an active EMT with numerous volunteer ambulance services since that time. He currently responds with the Gallatin River Ranch Volunteer Fire Department where he serves as the Medical Officer and Assistant Chief.

He completed his undergraduate work at Carroll College, received his Master's degree in psychology from Montana State University and is currently completing his doctorate in Health and Human Behavior from Walden University.

MICHAEL H. THOMASON, MD, FACS

Michael H. Thomason, MD, is Clinical Professor of Surgery at UNC School of Medicine, Associate Chairman of the Department of General Surgery and Medical Director of the Ross Trauma Center at Carolinas Medical Center in Charlotte, NC. He received his undergraduate degree from Davidson College and graduated from the University Of North Carolina School Of Medicine in 1978. After completing general surgery training at Charlotte Memorial Hospital (now Carolinas Medical Center), he became the second full time faculty member in general surgery in an institution that has since evolved from a community hospital training program into the only non-university academic medical center in North Carolina, the Carolinas Medical Center.

In 1985, he helped to develop and direct the trauma program from its inception as a Level II state designated trauma center to an ACS Level I trauma center serving the 20 county Metrolina region of North and South Carolina. He has served several terms as Chairman of the Metrolina Trauma Advisory Committee, and has been both Vice Chairman and Chairman of the North Carolina Committee on Trauma. During this time, he also directed the State Trauma Advisory Committee (STAC). He is currently Chief of Region IV (Southeastern US) for the ACS Committee on Trauma, and is also a site visitor for the COT Verification Review Committee.

Following recommendations made by the COT Trauma Systems Review of North Carolina in 2004, he has recently become the first Trauma Medical Advisor to the Office of Emergency Medical Services, the regulatory agency for the statewide trauma system.

As Medical Director of the Ross Trauma Center, he has recruited a diverse group of eight trauma/ critical care/ acute care surgeons who provide continuous in house coverage for the highest volume trauma center in the state.

Appendix B: List of Participants

Name	Title	Organization
Ashley, Dennis, MD	Commission Chair/Chief of Service	Trauma Commission/Medical Center of Central Georgia
Atkins, Liz	Trauma Coordinator	Children's Healthcare of Atlanta
Bambi, Bruce	Trauma Coordinator	Walton Regional Medical Center
Billings, Marty	Director, State Office of EMS	OEMS- Skyland
Carter, John	Injury Epidemiologist	Emory- RSPH
Clark, Charlotte	Hospital Emergency Coord.	Grady Health System
Cole, Linda, RN	VP of Trauma and Emergency Services	Children's Healthcare of Atlanta
Conrad, Sharon	Program Consultant	IPS- Child BSSU Patient Safety
Ford, Elizabeth	Acting Director	Division of Public Health
Frey, Tina	Trauma Coordinator	Children's Healthcare of Atlanta
Haley, Leon, MD	Chief of Emergency Services	Grady Health System
Hardcastle, William R.	Surgeon	Dekalb Medical Center and Medical Assoc. Of GA
Hawkins, Michael	Trauma Director	Medical College of Georgia Healthcare, Inc.
Hayslett, Charlie	Pres., CEO	Hayslett Group
Haley, Leon	ED Medical Director GTCNC Member	Grady Health System/GTCNC
Hinson, Ben	Paramedic/Businessman, Owner, Mid-Georgia Ambulance, GTCNC	Trauma Commission Member
Isokov, Alex	Medical Dir.	Emory Flight, CEPAR
Jones, Cherry	Trauma Coordinator	Floyd Medical Center
Kellerman, Art, MD	Emergency Physician, Professor	Emory Healthcare

Name	Title	Organization
Kitchens, Debra	Trauma Coordinator	Medical Center of Central Georgia
Lewis, Fran	Trauma Coordinator	Grady Health System
Lu, Daniel	Neurosurgeon	Emory Healthcare
Massoud, Romeo, Dr.	Trauma Medical Director	Gwinnett Medical Center
Matthews, Ray, MD	Trauma Medical Director	Grady Health System
Medeiro, Regina	Trauma Coordinator	Medical College of Georgia Healthcare, Inc.
Mercer-Cobb, Lawanna	EMS Regional Program Manager	Region 6, Augusta
Millican, Seth	Lobbyist	GAEMS
Mood, Rochella	Trauma Coordinator	Atlanta Medical Center
Moran, Belen	Risk Communicator	DHR/PH
Morgan, Renee	Trauma Systems Manager	Office of Preparedness/EMS/Trauma
Moyo, Mutinhime	Surgeon	North Fulton Regional Hospital
Nadeau, Kelly	Trauma Coordinator	Dekalb Medical
Nadolski, Bob		Emory Healthcare
Oliver, Lee	Director of EMS	The Medical Center of Central Georgia
Pereira, Greg	Trauma Coordinator	Children's Healthcare of Atlanta
Pettyjohn, Jim	Administrative Assistant	GTCNC
Probst, Marie	Trauma Registrar	Office of Preparedness/EMS/Trauma
Queen, Sharon	Nurse Manager	Walton Regional Medical Center
Roberson, Cyndie		Children's Healthcare of Atlanta

Name	Title	Organization
Rozycki, Grace, MD	Trauma Medical Director	Grady Health System/Emory HealthCare
Sargent, Jim	Trauma Coordinator	North Fulton Regional Hospital
Soloman, Gina	Trauma Coordinator	Gwinnett Medical Center
Terwilliger, Courtney	President	GAEMS
Threlkeld, Chris	EMS Program Manager	GAOEMST/DHR Region 5
Wages, Keith	Disaster Preparedness Coordinator	GAEMS
Wickersham, May Eleanor	Gov. Health Policy Analyst	Governor's Office
Yancey, Arthur	EMS Medical Director	Fulton EMS/Emory EM

Appendix C: Methodology

The Georgia Trauma Care Network Commission, with support from the Office of EMS and Trauma (OEMS/T) requested this trauma system consultation, which was conducted under the auspices of the American College of Surgeons (ACS), Trauma System Consultation program (TSC). The multi-disciplinary Site Visit Team (SVT) consisted of: two trauma/general surgeons, one emergency physician, a State EMS/trauma director, a trauma program manager, a rural trauma and prehospital specialist, and a public health and pediatric specialist. Biographical sketches for team members are included as Appendix A of this report.

Prior to the visit, the SVT reviewed the ACS Pre-Review Questionnaire (PRQ) completed by the state's trauma systems manager with input from other sources. The format of this report correlates with the public health framework of assessment, policy development, and assurance outlined in the ACS *Regional Trauma Systems Optimal Elements, Integration and Assessment: System Consultation Guide*. The SVT also reviewed a number of related supporting documents provided by the ISDH and information available on state government websites.

The SVT convened in Atlanta, Georgia on January 4th-7th, 2009 to review the State of Georgia trauma system. The meetings during the four-day visit consisted of plenary sessions during which the SVT engaged in interactive dialogue with a broad range of representative trauma system participants. There was also an opportunity for informal discussion with the participants, and time devoted to questions and answers. During the survey, the SVT also met in sequestered sessions for more detailed reviews and discussion, and for the purpose of developing a team consensus on the various issues, preparing a report of their findings, and developing recommendations for future development of the trauma system in Georgia. This report was developed independently of any other trauma system consultations or assessments.