ACS TSC Trauma Systems Consultation
American College of Surgeons

Trauma System Consultation Report

Georgia State Trauma System

Pine Mountain and Cartersville, GA

January 9th-13th, 2023

An interdisciplinary working group prepared this document based on the consultation visit that took place January 9th-13th, 2023, in Georgia, and included the following members:

ACS Review Team Leader

Brian Eastridge, MD FACS
Trauma Surgeon
Chair, Trauma Systems Evaluation and Planning Committee, ACS COT
Professor, Department of Surgery
Division Chief, Trauma and Emergency General Surgery
Jocelyn and Joe Straus Endowed Chair in Trauma Research
University of Texas Health Science Center at San Antonio
San Antonio, TX

ACS Review Team

Jeffrey Kerby, MD, PhD, FACS
Trauma Surgeon
Chair, ACS Committee on Trauma
Brigham Family Endowed Professor/Director
Division of Trauma and Acute Care Surgery
Department of Surgery
University of Alabama at Birmingham
Birmingham, AL

Jorie Klein, MSN, MHA, BSN, RN
Trauma Program Manager
Director, EMS/ Trauma Systems Section
Texas Department of State Health Services
Austin, TX

William Oley, MD, FAAFP, FAWM, DiMM
Emergency Physician
Beartooth Billings Clinic
Red Lodge, MT

Michael A Person, MD, FACS
Trauma Surgeon- Rural Specialty Reviewer
Associate Professor, Dept. of Surgery
Surgery Clerkship Director, University of South Dakota - Sanford School of Medicine
Chair - Trauma / Acute Care Surgery
Avera McKennan Hospital & University Health Center
Sioux Falls, SD

Curtis Sandy, MD, FACEP, FAEMS
State EMS Medical Director
Idaho State EMS Medical Director
Portneuf Medical Center
Pocatello, ID

Kristan Staudenmayer, MD, MS, FACS
Trauma Surgeon
Vice Chair, Trauma Systems Evaluation and Planning Committee, ACS COT
Trauma, Surgical Critical Care, and Acute Care Surgery
Gordon and Betty Moore Endowed Faculty Scholar
Associate Professor of Surgery
Stanford University
Palo Alto, CA

ACS Program Staff

Melanie Neal, MS
Specialty Reviewer; Trauma Quality Programs Staff
Assistant Director, Trauma Quality Programs, American College of Surgeons
Chicago, IL

Holly Michaels, MPH
Trauma Systems Programs Staff
Manager, Trauma Systems and Injury Prevention Programs, American College of Surgeons
Chicago, IL

Mackenzie Dafferner, MPH
Trauma Systems Programs Staff
Program Manager, Trauma Systems Programs, American College of Surgeons
Chicago, IL

Table of Contents

Executive Summary

Georgia is the 24th largest state in area and the 8th most populous of the 50 United States with an estimated population of 10,912,876 persons in 2022, which has increased by 1,225,223 citizens since 2010. The state has 57,716 square miles with an average of 189.1 persons per square mile and is divided into 159 counties, the second highest number of counties in the US. The state demography is a mix of highly urbanized areas and substantial rural areas. Georgia's rural population for 2021 was 1,488,191. For context, 118/159 counties within Georgia are considered rural, with a population less than 50,000.

Fundamentally, the trauma system in the State of Georgia has "good bones". The trauma system is divided into 10 regions, which correspond with the 10 EMS regions, for the purpose of coordination and administration. Distributed throughout the Georgia State Trauma System, there are currently 34 trauma centers, including four Level I, eight Level II, eight Level III, and nine Level IV adult centers. In addition, there is one Level I and two Level II pediatric trauma centers, and two burn centers. From legislative appropriation, the Georgia Trauma System has dedicated funding for trauma system development. The system is maintained and advanced by a passionate and invested group of system stakeholders with a vision to advance injury care for the citizens of Georgia. Since the 2009 American College of Surgeons (ACS) Committee on Trauma (COT), Trauma System Consultation (TSC), the State of Georgia has demonstrated several iterative improvements in trauma system development and implementation. Despite these efforts, the vision of an inclusive trauma system for the state has yet to be realized.

Several substantive challenges impede the advancement of the Georgia Trauma System. There are two leadership agencies, the Department of Public Health (DPH) Office of Emergency Medical Services and Trauma (OEMST) and the Georgia Trauma Care Network Commission (or Georgia Trauma Commission, GTC), which is a source of conflict and confusion amongst stakeholders. There are no rules or processes on how the two leading agencies should work together for system maintenance and advancement. Likewise, there is no process to define accountability for trauma system leadership. Similar to the findings of the 2009 Georgia Trauma System Consultation report, it is incumbent upon the system stakeholders and the state legislature to clearly define "lead agency" authority. Despite dedicated funding appropriated by the state legislature, there are insufficient fiscal resources to support the projected revenue needed to comprehensively support an inclusive trauma system and the internal operational requirements of the OEMST.

In general, the trauma system is siloed and not well coordinated. These challenges are potentiated within the rural environment. Despite known liabilities within the rural communities within the state, there has been no formal needs assessment to identify gaps including EMS, trauma hospitals, and transfer capabilities. The rural trauma system components are substantively underfunded. EMS is severely under resourced to support the injury care mission in rural Georgia leading to prolonged response and transport times. Similarly, there is minimal incentive for trauma system participation of rural health care facilities. These hospitals are plagued by insufficient trauma education and operational support and overtaxed hospital capacity. Likewise, hospital capacity issues across the state and inconsistent trauma transfer protocols lead to injured patients being stranded and substantial delays in definitive care.

The State of Georgia is at a critical juncture in the evolution of its trauma system. Uniting around the vision of an inclusive trauma system with coordinated regional implementation, fostering rural injury care advancement, and comprehensively leveraging the engagement of a large, diverse, and passionate stakeholder group will be essential to the evolution of the Georgia Trauma System.

Assets and Advantages

- Authority exists to designate facilities, monitor effectiveness of the trauma system, recruit new facilities, and conduct research on care.
- Georgia Trauma System funding appropriations address funding for system development, EMS, and trauma systems.
- There are active committees within the Georgia Trauma Commission (GTC).
- Leadership is dedicated to improving trauma care in the state.
- The Stop The Bleed (STB) program has been successfully promulgated throughout the state.
- The EMS providers are passionate.
- A majority of EMS providers in the state are paid.
- Resources exist to facilitate system triage and patient flow with the potential to support statewide load balancing.
- There is an active statewide quality improvement collaborative.
- External verification is now required for all Level I, II, and III centers to receive GTC funding.
- Numerous rehabilitation facilities exist with subspecialties including pediatric, brain, and spine.
- The Georgia Trauma Commission actively engages with the legislature.
- Two Needs Based Assessments of Trauma Systems (NBATS) analyses have been completed.
- The Office of Emergency Medicine and Trauma (OEMST) has a dedicated state trauma registrar.
- The Department of Public Health (DPH) demonstrates strong resources in injury epidemiology.
- The GTC has resources to assist facilities to develop their trauma performance improvement plans.
- Georgia code has specific protections for confidentiality and discoverability of peer review proceedings.
- Strong and productive relationships exist among the many entities that participate in disaster preparedness across the state.

Challenges and Vulnerabilities

- There is no single lead agency and there are no rules or processes on how the two leading agencies should work together.
- No defined accountability for system oversight exists.
- Current system funding does not meet the projected revenue needed to support the Georgia Trauma System.

- The OEMST does not receive the appropriate level of funding to fulfill oversight activity.
- There is no state level multidisciplinary advisory group for trauma.
- A formal and comprehensive process for stakeholder inclusion and engagement is lacking.
- The trauma system plan is outdated and does not inform activities of the system.
- There is siloed expertise and resources for injury prevention.
- EMS is not recognized as an essential service.
- There is limited ability to accommodate interfacility transfers.
- Diversion is inconsistently defined.
- No standardized destination protocols/guidelines exist.
- The designation process is not aligned with standards.
- Minimal collaboration between trauma system leadership and rehab facilities/providers exists.
- There is no uniform operational guidance for Regional Trauma Advisory Committees (RTACs).
- Population-based needs are not routinely assessed.
- Data is not used to monitor and evaluate the system or trauma outcomes.
- Inclusion of rural facilities in the hospital outcome review process is lacking.
- A statewide trauma performance improvement plan is not available.
- There is no formalized coordination of trauma specific aspects of patient care and routing between the Healthcare Coalitions (HCCs) and the RTACs.

Themes

- Passionate and dedicated leaders and stakeholders
- "Good Bones"
- Lead agency structure is not effective in meeting system needs
- System is underfunded
- Significant system challenges in the rural environment
- Inadequate and inconsistent trauma triage protocols
- Data is not leveraged to inform and improve the system

Priority Recommendations

From the list of all recommendations proposed by the ACS Trauma System Consultation (TSC) Review Team for the 2022 Georgia TSC, a select group of priority recommendations were identified as requiring the most focus and attention. Additionally, there are separate recommendations addressing the rural environment in Georgia.

The State of Georgia had their first TSC in 2009, and some of the findings and recommendations from that visit are still relevant. Recommendations that are italicized were also included as recommendations from the 2009 GA TSC Report. Please note: some of the 2009/2022 recommendations are verbatim, while others contain slightly different language, but the intent has been maintained.

Statutory Authority

- *Identify, through legislation, a single lead agency, consistent with national norms, for trauma system oversight and development. In lieu of that, develop a structured crosswalk that defines the trauma system responsibilities for the Georgia Trauma Commission (GTC) and Office of Emergency Medical Services and Trauma (OEMST) in statute. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

Funding

- Conduct a new statewide study to determine current funding needed to sustain and advance the Georgia Trauma System and statewide EMS across the continuum of care.

- Obtain dedicated, sufficient funding for the Georgia Trauma System.

- Evaluate existing funding to identify opportunities for redistribution to develop and sustain the rural components of the system.

Multidisciplinary

- Conduct a full trauma system stakeholder analysis. Utilize this information to structure the Multidisciplinary Advisory Group to ensure there are member seats for all ten regional trauma advisory councils (RTACs). Optimize inclusive representation of the components of the trauma system including:
    - Level I-IV trauma centers, specific inclusion of rural trauma centers
    - EMS
    - Rehabilitation
    - Non-designated facilities
    - Military
    - Special populations (e.g., pediatrics, geriatrics)
    - Hospital administrators

Trauma System Plan

- Develop an updated state trauma system plan and revise on a regularly scheduled basis.

- *Create an inclusive trauma system. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

Emergency Medical Services

- Declare Emergency Medical Services (EMS) as an essential service and establish funding mechanisms for sustainability.

System Triage and Patient Flow

- *Develop standardized regional destination protocols including appropriate patient transport to Level IV centers. (This was also a recommendation from the 2009 Georgia State Trauma System review)*

- Develop a Regional Medical Operations Center (RMOC) structure statewide for resource monitoring, patient transport, transfers, and load balancing.

Definitive Care

- Develop and implement a structured process which ensures accountability, compliance, and consistency in the designation of trauma centers including:
    - Compliance with designation criteria
    - Processing of designation applications by the lead agency within 60 days
    - Creation of systems to ensure every facility completes designation review every 3 years

Trauma Registry

- Develop a collaborative stakeholder data use workgroup to define data needs required to evaluate and manage the trauma system.

System-wide Performance Improvement

- Develop, implement, and document a systemwide trauma system performance improvement plan.

Disaster

- Develop, at the state level, a multidisciplinary disaster planning group and integrate capability of the Regional Medical Operations Center (RMOC) into all regional plans.
    - Include representatives from Georgia Emergency Management and Homeland Security Agency (GEMA), Department of Public Health (DPH), Healthcare Coalitions (HCCs), regional trauma advisory council (RTAC) leadership, trauma experts (to include trauma leadership at Regional Coordinating Hospitals (RCHs)), EMS stakeholders, military, and others with identified expertise and resources in the management of multiple trauma events.

Rural

- Perform comprehensive resource/needs assessments addressing the following:
    - Funding for the rural trauma system emphasizing the rural aspect of EMS and trauma hospitals.
    - Evaluation of rural trauma capacity to identify gaps including EMS, trauma hospitals, and transfer capabilities.
    - Recruitment and retention primarily focusing on rural providers, nursing, and EMS.

- Ensure involvement and participation of the rural trauma hospitals and EMS in an inclusive Georgia statewide trauma system plan.

- Standardize trauma care in rural Georgia through educational programs.

- Improve the capability to manage injured patients in the rural environment by increasing the complement of emergency medicine providers and improving competency of existing providers in rural emergency departments.

- Improve scene response times by bolstering existing mutual aid agreements and addressing staffing shortages.

- Develop a process for rescue stops and accelerated transfer in rural areas.

- Provide education and collaboration opportunities for rural facilities to achieve proficiency regarding data entry and validity.

- Provide rural trauma program managers process improvement training along with mentorship and support from other facilities.

Essential Trauma System Element #1: Statutory Authority

Statutory authority to enable development and implementation of a trauma system should exist. A lead agency with sufficient authority to implement policy, maintain well-defined administrative rules, and allocate trauma system funds, should be established or identified. A multidisciplinary advisory group, consisting of stakeholders representing the full spectrum of trauma care, should guide the lead agency.

Purpose and Rationale

A trauma system is a public good with public and private sector partners. It integrates all-population injury care and prevention to achieve optimal outcomes by saving lives and restoring function in life for injured patients and communities. Statutory authority for the trauma system is provided through legislative action. Statute may define the sources of funding and mechanism of fund distribution to elements of the trauma system. A trauma system requires deliberate development and implementation to ensure optimal resources for care of the injured patient and readiness for mass casualties. State legislatures and municipalities determine requirements for components of trauma systems through statutes (i.e., laws) and administrative codes. Statutes and codes are implemented through public rulemaking by a lead agency designated by statute, typically within a Department of Health. On occasion, a legislative body may create and/or designate a not-for-profit foundation as the vehicle for trauma system oversight. Aggregated rules are the regulations that must be followed by the components of a trauma system. Regulations in the trauma system are subject to administrative judicial review and deliberation. The lead agency should regularly review trauma system statutes and regulations.

The legislature and chief governmental executive designate a lead agency to fulfill the functions described in statutes. Core functions of the lead agency should include implementation of prevention activities, coordination of EMS transport protocols, designation of trauma centers, data management and system-wide performance improvement, and provision to support patient data confidentiality and protection from discoverability. Lead agencies also implement trauma system related policies within the statutory framework. The lead agency should monitor aggregate care outcomes through a risk-adjusted, benchmarked registry program with validated data. Lead agency and trauma system component accountability is enhanced with transparency, such as an annual report on trauma system performance and public funding. The chief governmental executive or lead agency should have the authority to appoint a multidisciplinary advisory group of stakeholders, representing the full spectrum of trauma care, to conduct a gap assessment, anticipate emerging system needs, and share guidance with the lead agency.

Current Status

The Office of EMS and Trauma (OEMST) has the statutory authority to designate trauma centers under O.C.G.A 31:11, though the development of a trauma system is not specifically mentioned. The OEMST has criteria and processes for Level I, II, III, and IV trauma center designation based upon the American College of Surgeons (ACS) Committee on Trauma (COT) criteria. While ACS verification is not currently required for designation, to receive Georgia Trauma Commission (GTC) funding, all Level I-III facilities must be ACS verified by either 2023 (Level I-II) or 2025 (Level III). Level IV centers will continue to be designated by the OEMST. In 2019, the OEMST structure was changed to include a “Systems of Care” section inclusive of trauma, cardiac, and stroke programs. The EMS for Children (EMSC) program is also housed within the System of Care section and has recently developed a pediatric readiness designation program.

The Georgia Trauma Commission (GTC) was created in 2006 with the main purpose of administering funding for facility and EMS readiness costs, uncompensated care, and additional centers to participate in the system. The GTC also helps with system development through data collection and quality improvement activities. Most recent, the Georgia Trauma Trust Fund was created and the GTC has oversight over the distribution of these funds. The GTC also has several committees to address various elements of the system. These committees are composed of stakeholders from the designated centers as part of their funding contracts. Part of the performance-based payment to trauma centers is tied to committee attendance.

Legislation does not clearly outline the lead agency nor the relationship between the OEMST and GTC other than language that the GTC should "coordinate its activities with the Department of Public Health". Due to this lack of clarification, the relationship between the two agencies has been strained at times. Ultimately, this dyad leadership model has resulted in a fragmented trauma system lacking a true lead agency accountable for system oversight. Stakeholders expressed confusion regarding system leadership and accountability. The GTC enabling legislation is very broad and not specific in outlining its role in system oversight. Having a single lead agency with broad responsibility for system regulation, oversight, and development is the national norm.

While there is an EMS Advisory Council which has trauma representation, there is currently not a state trauma advisory committee. The Regional Trauma Advisory Committees (RTACs) are subcommittees of the regional EMS councils and do not have an effective reporting structure within the trauma system. There is a state EMS Medical Director within the OEMST, but there is not a State Trauma Medical Director.

Recommendations

1.1. ***Identify, through legislation, a single lead agency, consistent with national norms, for trauma system oversight and development. In lieu of that, develop a structured crosswalk that defines the trauma system responsibilities for the GTC and OEMST in statute. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)***

1.2. Develop a State Trauma Medical Director position within OEMST.

1.3. Conduct a gap analysis on resource and funding needs for OEMST.
- Provide OEMST with adequate staffing and funding to fulfill their statutory roles.

1.4. Develop accountability measures and processes for lead agency structure.

1.5. Establish administrative rules for a multidisciplinary trauma advisory committee including structure, responsibilities, and authority.

1.6. Outline in rule the responsibilities, composition, and reporting structure for RTACs.

Essential Trauma System Element #2: Funding

The lead agency should establish a sustained funding mechanism for trauma system infrastructure. Funding should include physical and staffing resources for program administration and oversight, data collection, data storage, data analysis, quality improvement activities, education, and support for disaster response and military integration.

Purpose and Rationale

Trauma systems need sufficient funding to plan, implement, and evaluate a statewide or regional system of care. Public funding should support trauma system components including trauma system administration, system level registry functions, and participation in statewide or municipal trauma performance improvement activities. The trauma system is a foundation for mass casualty readiness and response, and funds should be allocated to trauma system elements for this purpose as well.

The lead agency should have sustained funding for trauma system infrastructure which should be established in statute or code. Funding might also come from sources external to the trauma system (e.g. traffic fines, offender court fees, vehicle title and driver license fees, grants, and general revenue), rather than from internal trauma system elements (e.g. trauma center fees for verification). Funding mechanisms should be transparent and well documented, including identified funding sources, determination of allocations, and anticipated uses. Funding allocation plans to support the trauma system may be linked to population density and injury rates within a specific geography or by facility and should be periodically reassessed to ensure system needs are met. Participation in system level quality improvement, and reporting of data and outcomes to the lead agency, may be required prior to fund distribution. Uses of funds may relate to trauma readiness costs, uncompensated care, and discretionary needs. Organizations receiving public funds should report annually on the use of those funds.

Funding is also required to sustain the trauma system oversight functions of the lead agency. The lead agency should have a program office that administers the trauma system with an appointed trauma system medical director, program manager and necessary support personnel. The primary objectives of the trauma program office are data management, system wide performance improvement, trauma center verification/designation, and facilitating integration of injury prevention, education, and advocacy.

Current Status

The funding source for the Georgia Trauma System includes super speeder fines and the GTC appropriated portion of the firework excise tax. The revenue generated is entered into the Georgia Trauma Fund, which was established in 2022. The current FY2023 appropriated budget is $21,444,840.00 for the Georgia Trauma System. This includes the up to 3% appropriation to the Office of EMS and Trauma (OEMST) and the Georgia Trauma Commission (GTC) operational budget and funds for disbursement. The GTC's budget funds the following elements of the system: operations, system development, EMS education, ambulance equipment grants, AVLS equipment and airtime, and trauma centers. The GTC also provides up to 3% of their funds to the OEMST for regulatory activities. The total budget for the OEMST in FY2023 was $10,033,445.00.

The total funding amount for the trauma system does not meet the projected $100,000,000 funding needed to support the Georgia Trauma System as calculated in the study completed by Bishop and Associates during the early development of the system.

The OEMST funding per OCGA 31.11.102 shall be used for the administration of an adequate system for monitoring state-wide 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. This funding supports the trauma program manager, trauma registrar, support staff, the Georgia Trauma Patient Registry, and oversight and administration of the trauma center designation process. The Governor's Office of Planning and Budget tracks and analyzes the trauma system finances.

The GTC oversees the flow of funds from Georgia Trauma Trust Fund. Established funding formulas are documented and utilized to calculate the funding allotment for trauma centers (readiness, uncompensated care, and registry), system development, and EMS.

GTC continues to refine the readiness cost methodology utilized to assess funding needs for the trauma centers. GTC completed two trauma readiness cost surveys for Level I and II trauma centers. In 2021 and 2022, GTC completed trauma readiness assessments for Level III and IV trauma centers. This was the first documented attempt at readiness cost analysis for Level III and IV trauma centers. Results from the trauma readiness costs analysis have been presented nationally and published.

GTC leadership and the budget committee instituted processes and strategic initiatives to foster the transparency and accountability for the funding of the Georgia Trauma System. All contracted trauma centers participate in the performance-based payment (PBP) program to be eligible for readiness funds that are based on the trauma center's compliance to specific criteria. The PBP program has three domains: trauma system participation, compliance with the American College of Surgeons "Resources for Optimal Care of the Injured Patient" standards, and Georgia Quality Improvement Program (GQIP) participation. Trauma centers must document the use of readiness funds and the distribution of uncompensated care to demonstrate improvements and utilization of the funds for trauma care.

The GTC's EMS committee oversees EMS-directed funding with final budget approval by the GTC. Most of the EMS funding supports the following three programs: AVLS, provider education, and 911 zone provider ambulance equipment grants. The AVLS and EMS education programs are governed by contracts with specific deliverables and require quarterly reporting to the EMS committee.

The GTC budget committee meets monthly to review the current financial position and metrics and prepare for emerging needs recognized after the initial budgeting process. All Commission contractors must submit detailed expense reports. The Governor's budget report includes the state revenues and the budget for the OEMST and GTC. Each budget has a line item indicating the funding source.

The GTC publishes an annual report that provides financial reporting data and highlights select trauma system initiatives. Budget documents are included in each GTC meeting as part of the Budget Committee report. Financial documents are available for public access on the GTC website. In addition, the GTC is legislatively required to present annually to the House and Senate Health and Human Services Committees.

Levels I – III trauma centers must be ACS verified to be eligible for funding. This rule begins in 2023 for the Level I and II centers and 2025 for the Level III centers.

Level I and II trauma centers receive funding from the total trauma fund allocations for uncompensated care. The amount of funding is based on available funds for the fiscal year and is distributed per the GTC's funding formulas. Uncompensated care is audited annually by a third-party auditing firm to ensure compliance with claims. Level III and IV centers receive funding based upon readiness and other activities such as the registry. The standard distribution to these centers is a small percentage of total funds disbursed. Rebalancing the funding model to increase funding for readiness to these centers may provide a substantial benefit to the system.

While the Georgia Trauma System has dedicated funding, it does not address specific studies to evaluate aspects of the trauma system such as health care disparities or social determinants, challenges related to access to care, or transfer and transport of patients needing a higher level of care.

Recommendations

2.1. **Conduct a new statewide study to determine current funding needed to sustain and advance the Georgia Trauma System and statewide EMS across the continuum of care.**

2.2. **Obtain dedicated, sufficient funding for the Georgia Trauma System.**

2.3. **Evaluate existing funding to identify opportunities for redistribution to develop and sustain the rural components of the system.**

2.4. Utilize the Georgia Trauma Foundation to explore options to maximize funding and generate additional funding through donations, events, and other options.

2.5. Include the outcomes and impact of the funding available in the GTC annual report.

2.6. Create a process to designate facilities with provisional status who are in active pursuit of trauma designation such that these provisional centers can charge for trauma activations.

Essential Trauma System Element #3: Multidisciplinary Advisory Group

A multidisciplinary advisory group, consisting of stakeholders representing the full spectrum of trauma care, should be established. The role of the advisory group should be to guide the lead agency regarding trauma system development and operations. Representation should be diverse, with respect to geography, population (rural/urban, adult/pediatric, burn), phases of care (prehospital and rehabilitative) and trauma center level designation.

Purpose and Rationale

A multidisciplinary advisory group that provides subject matter expertise to the lead agency is a critical component of the trauma system. A key responsibility of the multidisciplinary trauma advisory group is regular communication of the trauma system status to the lead agency related to the burden of injury within the trauma system and the impact of the trauma system on the community. Membership should include representatives from a broad constituency across the full spectrum of injury care including, but not limited to, the following: trauma center medical directors, trauma program managers, data registry personnel, pre-hospital professionals, and injury prevention advocates. The multidisciplinary advisory group should be diverse with respect to geography, population (rural/ urban/ adult/ pediatric, burn), and trauma center designation level. The group should also include representation from military treatment facilities to support military civilian integration. The multidisciplinary advisory group works with lead agency officials to:

- Develop and evaluate the trauma system plan.
- Inform and educate the public and legislators about the trauma system.
- Provide consultative assistance for enabling legislation.
- Assist with trauma system quality and performance improvement and research efforts.
- Implement injury prevention programs.
- Promote collaboration and system integration amongst trauma system stakeholders.
- Assist with emergency preparedness and disaster response planning.

As challenges are encountered with providing optimal care to injured patients within the system, the multidisciplinary advisory group responds by evaluating the issue and collaborating with the lead agency to develop action plans with measurable results. The multidisciplinary advisory group contributes to building coalitions through the cultivation and maintenance of relationships with key constituents involved in trauma system development, including healthcare professionals, trauma center administrators, pre-hospital professionals, health insurers and payers, trauma registry and data experts, consumers and advocates, policy makers, and members of the media.

Coalition Building and Community Support

The trauma system must engage its constituents to pursue a common goal. Coalition building is a continuous process of cultivating and maintaining relationships with constituents in a state or region through collaboration on injury control and trauma system development. Key constituents include health professionals, trauma center administrators, prehospital care professionals, health insurers and payers, data experts, patients, patient advocates, policy makers, public safety, local industry and business, and media representatives. The coalition serves an important support role for the following:

- Trauma system plan development and implementation
- Collaboration among all of the trauma system members

- Integration of system elements
- Advocacy for policy development such as authorizing legislation and regulations
- Development and sustainment of system resources
- Disaster preparedness

The coalition informs the multidisciplinary state and regional advisory groups to support trauma system planning and implementation efforts. Information sharing and education are important to reduce the incidence of injury in all populations and to demonstrate the value of an effective trauma system. Regular communication about the status of the trauma system, using system-derived data, helps these key partners to recognize opportunities for improvement. The trauma system's stakeholders also communicate with elected officials regarding the development and sustainability of the trauma system. Stakeholders inform and educate governmental leaders to make them effective partners in policy development to support trauma system improvement.

Current Status

A strong, broad, and diverse multidisciplinary advisory group is essential to the development and maturation of an inclusive trauma system. Currently, there is no multidisciplinary advisory group advising the trauma system development efforts of the State of Georgia. There was an informal multidisciplinary advisory group, which was dissolved after the inception of the Georgia Trauma Commission. The lack of a current, formal, and comprehensive stakeholder inclusion and engagement process has stymied the progress of trauma system development and performance for the state.

The Department of Public Health has identified an initial focus group to update the state trauma plan. The intended representation for this initial group will consist of trauma facilities, injury prevention, emergency preparedness, pediatrics, EMS, fire service, and coroner. Though the Department of Public Health has renewed insight and has reinvigorated effort to develop an advisory council, the weakness of this approach is that it is informal and does not integrate numerous essential trauma system stakeholders in the development of the plan. With the rural challenges of the trauma system, it is notable that there is a specific lack of inclusion of rural stakeholders in the proposed process.

With its evolution, the Georgia Trauma Commission has established committees which are tasked with making recommendations to advance the mission of developing a statewide trauma system in Georgia. The existing committees include Budget, EMS, Trauma System Performance, Georgia Committee for Trauma Excellence (GCTE), Level III and Level IV Trauma Centers, Trauma Center Administrators, and Trauma Medical Directors. Though these committees meet regularly, there is no composite interaction with which to drive trauma system maturation. The GTC presents annually to the Georgia House and Senate Health and Human Services Committees with respect to the status of the trauma care system in Georgia. Due to inherent limitation imposed by the current committee structure of the Georgia Trauma Commission, it is challenging to portray a comprehensive and thoughtful perspective of the trauma system.

Currently, the State of Georgia has a robust consortium of EMS councils including the State Emergency Medical Services Advisory Council, the State Emergency Medical Services Medical Directors Advisory Council, and the Regional Emergency Medical Services Advisory Council.

The councils are appropriated by state administrative code Rule 511-9-2-.03 and Rule 511-9-2-.04. These councils are composed of between 25 and 35 members, with only one mandatory trauma representative. Hence, it would serve the trauma system to codify the structure and function of the trauma multidisciplinary advisory group in administrative rule to authorize and codify its existence.

Trauma system best practice would suggest that the leadership of the trauma system should conduct a full trauma system stakeholder analysis and subsequently utilize this information to structure the multidisciplinary advisory group. There should be an established priority of inclusion to ensure that all regional trauma advisory councils (RTACs) are represented. In addition, efforts should be made to optimize inclusive representation of the components of the trauma system including:

- All level trauma centers, including rural
- Emergency Medical Services
- Rehabilitation
- Non-designated hospitals
- Military
- Special populations (e.g., pediatrics, geriatrics)
- Hospital administration
- Community-based organizations
- Patient advocacy and survivor organizations
- Payer groups

Once assembled, a formal guidance document should be developed to guide the structure and operations of the multidisciplinary advisory group. Additionally, organizational reporting relationships to trauma system leadership should be established to optimize functionality of the trauma system.

Recommendations

3.1. **Conduct a full trauma system stakeholder analysis. Utilize this information to structure the multidisciplinary advisory group to ensure there are member seats for all ten regional trauma advisory councils (RTAC). Optimize inclusive representation of the components of the trauma system including:**
   - **Level I-IV trauma centers, specific inclusion of rural trauma centers**
   - **EMS**
   - **Rehabilitation**
   - **Non-designated facilities**
   - **Military**
   - **Special populations (e.g., pediatrics, geriatrics)**
   - **Hospital administrators**

3.2. Formally define the operational and reporting relationships between the multidisciplinary advisory group and the lead agency.

3.3. Establish and codify the structure and function of the trauma multidisciplinary advisory group in administrative rule.

Essential Trauma System Element #4: Trauma System Plan

An integrated trauma system plan should be created and implemented. This plan should be reviewed annually and updated every three years at a minimum, under the direction of the lead agency and the multidisciplinary advisory group.

Purpose and Rationale

Each trauma system, as defined in statute, should have a clearly articulated process to develop a trauma system plan. This strategic plan is used to guide trauma system development and functionality and should address all essential trauma system elements. It describes the system design with adopted standards of care for prehospital and hospital personnel. The plan should be built on an inventory of trauma system resources, identifying gaps in services or resources and the location of assets. A needs assessment should be developed to support the trauma system plan and updated periodically to assess population and system changes over time. The plan should consider trauma system resources, population demographics, and barriers to care access (e.g., rural, geography, resources). It is critical that the plan also identify specific populations (e.g., pediatric, geriatric, burn) within the trauma system how the needs of each of these populations are addressed.

The plan should be developed by the lead agency with support from the multidisciplinary advisory group and any associated regional advisory committees. Based upon the system needs assessment, goals and objectives for each trauma system component should be developed with specific timelines for achievement. System stakeholders should regularly report to the lead agency to address barriers inhibiting system success and assure system and plan development. The plan should include references to regulatory standards, documents supporting trauma system development, and methods for data collection and analysis. The trauma system plan should include interfaces between the operational plans of supporting agencies and services, including EMS, injury prevention, public health, and emergency preparedness. The trauma system plan should be reviewed annually and updated periodically under the direction of the lead agency and the multidisciplinary advisory group.

Current Status

The Georgia Office of Emergency Medical Services and Trauma (OEMST) developed a trauma system plan in 2015, six years after the 2009 American College of Surgeons Georgia Trauma System Consultation visit. This plan was due for revisions in 2020, but this was delayed due to the COVID pandemic. The state trauma system plan development process was notable for failing to seek and ensure system-wide stakeholder engagement. The plan is distinct from the Georgia Trauma Commission (GTC) strategic plan. It was noted that there was an attempt to "cross-walk" the trauma system plan and the strategic plan after the first draft was created, but the degree of integration appears to be limited. After completion of the plan, there were no dedicated efforts around dissemination or education, nor was the trauma system plan used to guide trauma system functions. As a result, many stakeholders throughout the system were unaware of the existence of a plan.

The state trauma system plan is written largely as a general descriptive document. The plan describes seven elements such as enabling legislation, funding, public education, injury prevention, pre-hospital resources, hospital designation, and research. However, gaps are not described, there are no system performance metrics outlined, standards are not referenced, and

there is no indication of how listed objectives are to be achieved. Most notably, the trauma system plan does not address how the two lead agencies are to work together to create a functional trauma system. It was noted that the OEMST would be responsible for designation, whereas the GTC would be responsible for funding. However, roles and responsibilities as they pertain to the outlined seven elements were not addressed. There was no mention of how the separated functions could be coordinated, and no process described how to reconcile conflicts. As a result, the plan contributed little more than friction between the two lead agencies.

The state trauma system plan is also not coordinated with Regional Trauma Advisory Committee (RTAC) trauma system plans, nor are RTAC plans coordinated with one another. The state trauma system plan is not referred to by RTACs for any of their plans or activities. Neither the state trauma system plan nor RTAC trauma system plans acknowledge trauma centers/systems in neighboring states nor discuss patients from neighboring states who are cared for in Georgia trauma centers. Taken together, the lack of coordination of trauma plans has led to fragmentation and isolation of regional trauma systems, leaving each region to solve challenges alone, duplicating efforts, and limiting resource availability.

During the 2009 ACS Georgia State Trauma System Consultation (TSC), it was noted that Georgia had an exclusive, rather than an inclusive, trauma system and this was cited as a significant weakness. The trauma system plan developed after this visit did not address this issue. Georgia remains an exclusive system, focused largely on trauma centers and, more specifically, higher-level centers.

The revision of the Georgia State Trauma System Plan should include significant revisions to both its development process as well as its content to address all these limitations. It will be important that the lead agency role(s) are clearly defined prior to writing the document, as it will be the lead agency that organizes a multidisciplinary stakeholder group for the purposes of writing a plan. To ensure that appropriate participants are involved, a systematic process to identify and engage key stakeholders is critical. Inclusion of stakeholders also increases the chance that the revised trauma plan will be inclusive, addressing the full continuum of care and all trauma system components. The state should strive to ensure an inclusive system, given this has been a challenge in the past. It will also be important that a gap analysis for the system is performed to identify specific resource and process needs.

When created, the plan should become the central organizing guidance document that provides direction to the Georgia State Trauma System to addresses all system components. It should reference existing rules and standards, address operational interfaces for stakeholders and other agencies, and address neighboring state resources and patients. The document should clearly spell out goals and objectives and timelines for completion. Each responsibility should be clearly tied to the entity responsible for that component. Integration with the RTAC trauma system plans is critically important. The state trauma plan should also consider neighboring states that may receive Georgia residents as well as Georgia trauma centers that receive out-of-state patients. Neighboring states are often part of one another’s trauma systems along the borders.

As the system matures, trauma system plans should be revised. This requires frequent reviewing of the plan and, ideally, a scheduled time frame for revision.

Recommendations

4.1. **Develop an updated state trauma system plan and revise on a regularly scheduled basis.**

4.2. ***Create an inclusive trauma system. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)***

4.3. Perform a gap analysis to inform the trauma system plan development.

4.4. The trauma system plan should do the following:
- Serve as a guidance document
- Reference existing rules and standards
- Address operational interfaces for stakeholders and other agencies
- Address neighboring state resources and patients
- Clearly define system goals and objectives
- Identify responsible entities for all activities
- Identify timelines for completion of stated goals and objectives

4.5. Develop a systematic process to identify and confirm engagement of key stakeholders in the creation and approval of the state trauma system plan.

4.6. Integrate RTAC trauma system plans and the state trauma system plan.

4.7. Disseminate the trauma system plan widely and socialize its content across all stakeholders in the system.

Essential Trauma System Element #5 Continuum of Care

The trauma system should address the full continuum of injury from prevention and pre-hospital/interfacility emergency medical services, to acute hospital care (referring and accepting facility) through rehabilitation. The system should address all injured patients with special attention to pediatric, geriatric, and other vulnerable populations.

5.1 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 should take a central role in fostering collaboration and cooperation between stakeholders at the state, regional, and local level for injury control. In addition, the lead agency and providers throughout the system should work with public health authorities, business organizations, social services providers, community-based organizations, and the public to support, enact, and evaluate prevention programs. Prevention strategies should be evidence-informed and based on system epidemiologic data.

Prevention efforts may represent primary, secondary or tertiary prevention. Primary prevention efforts should be deployed across an entire population in order to decrease the overall risk of injury (e.g., civil engineering, window guards, smoke detectors). Secondary prevention efforts focus on a known population that is at risk and should be aimed at mitigating the effects of the traumatic incident (e.g., car seats, seat belts, helmets). Finally, tertiary prevention activities aim to lessen the impact of trauma on the individual and community (e.g., support for EMS and trauma systems, access to care, rehabilitation).

Efforts at prevention must be directed toward the intended audience at risk, well defined, and structured, with evaluation of their impact. Further, injury prevention efforts should be informed by and relevant to the local community. The implementation of injury control and prevention requires the same priority as other aspects of the trauma system, including adequate staffing, funding, and partnerships with community organizations. Many systems focus primarily on providing information and education directly to the general public (e.g., restraint use, not driving while intoxicated). A program that can be utilized is the STOP THE BLEED® (STB) program. STB provides a tool to partner with trauma systems and the community by empowering, informing, and educating the public to respond to a bleeding emergency. Education efforts should also be directed toward all continuum components, such as emergency medical services (EMS), acute hospital and rehabilitation personnel safety (e.g., securing the scene, infection control). Collaboration with public agencies, such as local departments of health, is essential to successful prevention program implementation. These partnerships can synergize and increase the efficiency of individual efforts. The formation of an injury control network with alliances across multiple healthcare, professional, and community organizations is beneficial. The prevention needs of children, elderly, and other vulnerable populations should be specifically addressed.

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

- Engagement of the lead agency and key stakeholders in the development of the community health needs assessments and the community health improvement plans.
- Integration with public health injury control programs for injury surveillance, coordination of resources, and implementation of prevention programs.
- Preparation of annual reports by the lead agency, along with partner organizations, on the status of injury prevention and trauma care in the system.

Current Status

Multiple entities, including the Georgia Department of Public Health (DPH), the Georgia Trauma Commission (GTC), and designated trauma centers actively participate in injury prevention efforts. Lack of integration of injury prevention leaders into this trauma stakeholder group contributes to siloed expertise, resources, and a lack of system-wide data collection. Inclusion of injury prevention leaders within the trauma stakeholder group was a recommendation in the 2009 Trauma System Consultation.

Despite these challenges, the DPH has collected data to identify critical priority areas for injury prevention. These are outlined in the 2022 Georgia Injury Prevention Strategic Plan. The critical priority areas identified include transportation, interpersonal violence, child abuse and neglect (CAN), safe infant sleep, suicide, falls, poisoning, and drug safety as well as traumatic brain injury (TBI), Alzheimer's Disease, and related dementia as risk factors for injury.

The Pre-Review Questionnaire (PRQ) documents an extensive list of partners throughout the state. This includes state-based programs as well as active chapters of national safety organizations such as Mothers Against Drunk Driving (MADD) and Students Against Destructive Decisions (SADD). There are extensive injury prevention resources available, including active programs addressing special populations (e.g., Safe Kids Georgia, Area Agencies on Aging,). Despite this robust cohort of partners, no statewide injury prevention coalition has been developed as recommended in 2009 Trauma System Consultation.

There is no central clearinghouse of evidence-based injury prevention programs available for trauma centers, EMS, and other organizations with an injury prevention focus. This would be a valuable resource to further injury prevention efforts in the state.

A statewide annual report of injury prevention and outreach services has not been compiled. In addition, there are no outcome data documenting performance improvement after implementation of injury prevention programs. This data would help to determine the efficacy and impact of injury prevention programs on the population.

The Georgia Trauma Commission's Stop The Bleed program is noteworthy as an injury prevention program with statewide implementation for all Georgia Public School Districts.

Recommendations

5.1.1. Incorporate trauma registry data into injury prevention to define critical priority areas.

5.1.2. *Integrate injury prevention leaders into the trauma stakeholder group. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.1.3. *Establish a statewide injury prevention coalition. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.1.4. Compile a statewide annual report of injury prevention and outreach services delivered.

5.1.5. Collect outcomes data documenting performance improvement after implementation of injury prevention programs.

5.1.6. Establish a central clearinghouse of evidence-based injury prevention resources that are available for all partners with an injury prevention focus.

5.2 Emergency Medical Services

Purpose and Rationale

Emergency Medical Services (EMS) is a critical component in the trauma system and is often the vital link between the injury event and definitive care. Thus, strong relationships between leadership within EMS, trauma centers, and lead agency trauma programs are necessary for optimal management of injured patients to reduce mortality and to produce best outcomes. EMS is a complex system that not only transports patients, but includes public access, communications, patient care by trained personnel, patient triage, data collection, and quality improvement activities.

There must be an EMS system medical director who has statutory authority to develop operational protocols, oversee clinical practice, and establish ongoing quality assessment to ensure optimal provision of prehospital care. The EMS system medical director should work closely with the regional trauma system leadership to ensure that care protocols and treatment goals are mutually aligned. The EMS system medical director should also have ongoing interaction with adult and pediatric stakeholders, including local EMS agency medical directors and the EMS for Children (EMSC) program. This will ensure that there is understanding of and compliance with trauma triage and destination protocols for trauma patients of all ages.

The lead agency should ensure that EMS is sufficiently resourced to meet the needs of the community served. To achieve this end, a resource and needs assessment and periodic reassessment evaluating the availability and geographic distribution of EMS personnel and physical resources are important. This ensures rapid and appropriate scene response, as well as availability of timely and appropriate interfacility transport services. This assessment should outline a detailed description of the distribution of ground ambulance and aeromedical locations across the region. EMS system assets should be positioned according to predictable geographic or temporal demands to optimize response efficiencies. Such positioning schemes require integrated prehospital data collection systems that track the location of occurrence and timeliness of responses over time. Interfacility transport services should be available in a timely fashion and staffed with EMS professionals who are appropriately trained (ideally in critical care), ensuring optimal patient care between facilities. Pre-identified transfer algorithms should be in place and readily accessible to transferring facilities to expedite patient transfer to higher levels of trauma care. Periodic assessment of dispatch and transport times provides insight into whether resources are consistent with population needs.

Each region should have objective criteria dictating the level of response (advanced life support [ALS] or basic life support [BLS]), mode of transport, and disposition of the patient based on mandatory system-wide prehospital triage criteria. The National Guideline for the Field Triage of Injured Patients, Appendix A, should be used as the framework for regional triage decisions. This ensures that trauma patients are transported to the most accessible and appropriate facility based on their injuries. These triage criteria should identify major trauma patients, including special populations such as pediatrics and geriatrics. A mechanism should be in place that allows for case-based QI review of trauma patients by prehospital and hospital providers. This allows bidirectional communication and continuing education. Ongoing review of triage and treatment decisions promotes continuing quality improvement of the triage process and prehospital care protocols. A more detailed discussion of prehospital (primary) triage criteria is provided in the System Triage and Patient Flow section.

Human Resources

Periodic EMS workforce assessments should be conducted to ensure adequate numbers and distribution of personnel. Addressing recruitment, retention, and engagement of qualified personnel should be a system priority. EMS system leaders must ensure that prehospital care professionals at all levels maintain competence in trauma care. This is best accomplished by requiring standards for credentialing and certification and specifying continuing educational requirements for all prehospital personnel involved in trauma care. The core curriculum for prehospital personnel (Emergency Medical Responder (EMR), Emergency Medical Technician (EMT), Advanced EMT (AEMT), paramedic, and all other levels of prehospital personnel) has 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 in collaboration with trauma system leadership (e.g. Prehospital Trauma Life Support®, International Trauma Life Support®, age-specific courses). Mechanisms for the periodic assessment of competence, educational needs, and trauma education availability within the system should be incorporated into the trauma system plan. Trauma patients are best served when EMS agencies (ground and air) and their training programs meet national standards and achieve national accreditation.

In some states, up to half of all EMS agencies are staffed by volunteers, typically in rural areas. These volunteer professionals are essential to the provision of immediate care and efficient transportation and may continue to augment care in the hospital setting. The trauma system should support these volunteer agencies in performing their vital role in the care of trauma patients. Such aid may be in the form of assistance with quality improvement activities, training, and clinical opportunities.

Due to the multidisciplinary nature of trauma care, educational conferences that include all levels of clinical professionals (e.g. prehospital personnel, nurses, and physicians) need to occur regularly. Communication with and respect for prehospital professionals is important, particularly 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 within the trauma system, as well as in connection with public health and other public safety agencies. EMS agencies have a critical role in ensuring that communication systems are available and have sufficient redundancy so that trauma system stakeholders will be able to access the EMS/trauma system and dispatch appropriate medical resources. This should be functional both at the single patient level and in response to mass casualty incidents (MCIs). Enhanced 9-1-1 services and a central EMS/trauma communication system ensure field-to-facility bidirectional communication, interfacility transfer dialogue, and an all-hazards approach among system participants. EMS should utilize all technological advances available to provide care to trauma patients, such as ultrasound, telemedicine, and wireless communications capabilities. Innovations such as automatic crash notification systems hold great promise for quickly identifying trauma-producing events, thereby reducing delays in discovery and decreasing prehospital response intervals.

EMS data define geographic and demographic characteristics of injuries and thus should assist trauma systems with the identification of injury prevention program needs. EMS serves a critical role in the development and implementation of all-hazards response plans. This integration should be included in the state and regional trauma plan and overseen by the lead agency. EMS leadership should participate in all aspects of trauma system design, evaluation, and operation, including policy development, public education, and strategic planning.

Current Status

The Office of EMS and Trauma (OEMST) regulates the EMS system through licensure of EMS clinicians and EMS agencies, including air medical services. There is a State EMS Medical Director, which is a part-time advisory position that focuses mainly on the EMS aspect of the OEMST duties. The OEMST has Regional EMS Directors responsible for oversight within each of the ten EMS regions. There is also a state Emergency Medical Services Advisory Council (EMSAC), a state Emergency Medical Services Medical Directors Advisory Council (EMSDAC), and Regional EMS Councils. Each of these councils has broad stakeholder representation and serves in an advisory role to the OEMST regarding EMS issues. The Regional Trauma Advisory Committees (RTACs) are subcommittees of the Regional EMS Councils.

Each EMS agency must have a medical director responsible for protocol development, EMS clinician competency, and quality assurance. Unfortunately, there is great variability in medical director expertise and involvement. Some agencies have minimal treatment protocols, and the EMSDAC is currently working on a minimum set of protocols required for each agency. Each medical director also provides trauma destination protocols, but these protocols are not standardized within a region and lead to diverse destination choices depending on agency. There has been hesitation at the state level to provide model clinical treatment protocols/guidelines over home rule concerns.

The majority of the state is covered by paid EMS personnel, with minimal volunteer resources. Despite this, there was consistent testimony regarding the fragility of the EMS system throughout the state. Most agencies are running under-staffed with increasing call volumes. There was mention that many of these calls are lower acuity. There is reluctance by EMS to transport patients outside of the local response area as it would leave the zone uncovered for future 911 calls. This also impacts interfacility transfers as agencies cannot provide an ambulance for long distance transfer. Because of workforce shortages, many agencies have resorted to starting their own initial training programs. Some agencies have even started recruiting and training high school students, so they are qualified to enter the workforce upon their graduation.

A recent study conducted by the Georgia Healthcare Workforce Commission highlighted the challenges facing the future of the healthcare workforce, including EMS. Their recommendations included expansion of technical college educational offerings, change in EMS regulation regarding ambulance crew configuration, and insurance payment for expansion and use of telemedicine programs.

Currently, EMS is not declared as an essential service in the State of Georgia. Additional sustainable funding is necessary to support the needs of the EMS system. Consider utilizing ambulance and professional licensing fees as a funding source.

There seems to be an adequate number of air medical resources in the state. However, distribution of resources into the southern portion of the state would improve response times and increase availability to support ground EMS crews.

There are a few agencies using telehealth technology, especially for low acuity calls, to reduce the need for transport. This technology is also starting to be leveraged for higher acuity calls, as well as for direct medical oversight.

Recommendations

5.2.1. **Declare EMS as an essential service and establish funding mechanisms for sustainability.**

5.2.2. Evaluate and adopt recommendations from the recently completed healthcare workforce study to increase EMS workforce and EMS agency flexibility in staffing.

5.2.3. Evaluate interfacility transport needs and identify possible solutions, including funding of transfer resources.

5.2.4. Provide model statewide treatment guidelines for agency adoption.

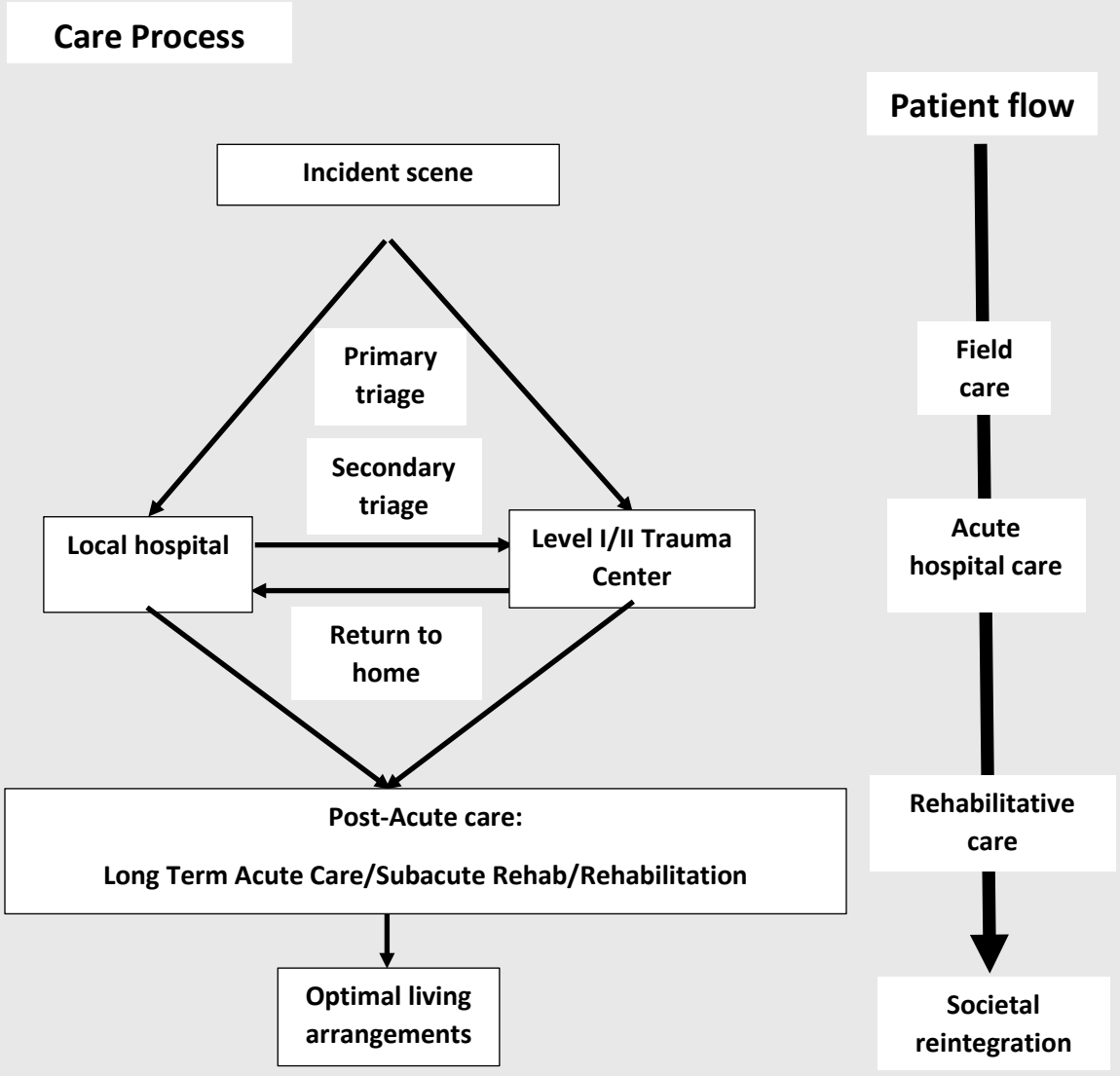
5.2.5. Expand use of telemedicine to augment EMS system response.

5.3 System Triage and Patient Flow

Purpose and Rationale

One of the fundamental aims of a trauma system is seamless and timely patient care that is needs-based and appropriately transitions injured patients through the entire continuum of care including prehospital, acute care, rehabilitation, and return home. Although on the surface this objective seems relatively straightforward, individual patient characteristics, geography, and transportation systems often present significant challenges. The most critically injured trauma patient is often easy to identify at the scene (e.g., 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 professionals. Primary or field triage criteria aid professionals in identifying patients at greatest risk for adverse outcomes and who might benefit from the resources of a designated trauma center. Even if the need is identified, regional geography or limited transport services might not allow for direct transport to the most appropriate facility.

This diagram shows the care process and patient movement through the trauma system.



Primary triage of a patient from the field to a center capable of providing definitive care is an initial goal of the trauma system. However, there are circumstances (e.g., 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 (e.g., pediatric trauma, burns, severe traumatic brain injury, spinal cord injury, ocular trauma, and extremity reimplantation). Finally, temporary resource limitations might necessitate the transfer of patients between acute care facilities. Prehospital trauma triage protocols should be consistent with national guidelines.

Secondary triage at the initial receiving facility has several advantages, especially in systems with a large rural or suburban component. The ability to assess patients at non-designated or Level III to V centers provides an opportunity to focus on the transfer of the most severely injured patients to Level I or II facilities, thus preserving limited resources 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 expedite the transfer process and minimize the potential for delays in care. Delays in transfer may increase mortality, complications, and length of stay. A system with excessive trauma transfers might stress the resources of the regional trauma facility and transport agencies, particularly in in smaller communities. Conversely, inappropriate retention of patients at centers without adequate facilities or expertise to appropriately take care of the patient might increase the risk of adverse outcomes. Given the importance of appropriate interfacility transfers, timeliness of the decision to transfer, the time to transfer, and the rates of over and under triage should be evaluated regularly. Bidirectional corrective actions should be instituted when events 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. It is critically important that injury related data be collected from all acute care facilities where injured patients are evaluated and not only from designated trauma centers.

A central communication coordinating base (e.g., transfer center) with real-time access to information on system resources greatly facilitates the transfer process. This communication base should identify a receiving center, facilitate dialogue between the transferring and receiving facilities, and coordinate interfacility transport.

Once acute needs have been met, patients often benefit from rehabilitation to maximize function and limit disability. Some patients, such as those with limb loss, loss of sight, paralysis, or significant head injury, benefit from specialized rehabilitation. Ideally, patients requiring rehabilitation should be identified early in their acute hospital phase so arrangements for an appropriate facility and transfer planning can occur before the patient is ready for discharge from an acute care hospital.

In order to optimize trauma system efficiency, efforts should be made to return patients back to their local community once the acute phase of trauma care is complete. Returning patients opens the limited resources available to care for the acute severely injured patients at Level I and II trauma centers. In addition, it brings patients back into their social networks for reintegration into their communities.

Current Status

The trauma system is divided into 10 regions, which correspond with the 10 EMS regions, for the purpose of coordination and administration. Each region has a Regional Trauma Advisory Committee (RTAC), though there is no uniformity in operations or coordination between the RTACs. The RTACs each have a coordinator funded by the GTC, who is responsible for coordination with the GTC and oversight of projects such as the Stop The Bleed initiative. However, non-designated facilities have minimal participation in the RTAC.

Individual RTACs have provided EMS with trauma triage and destination guidelines. However, EMS agency medical directors have the ability to disregard these and develop specific agency guidelines. This leads to variable triage and destination choices by EMS within the same region. There was testimony that EMS destination decisions were highly variable based upon EMS judgement. There was additional testimony regarding patients transferred by default to the highest-level center without consideration for transport to a closer Level III or Level IV facility. Conversely, testimony raised concerns that EMS would transport to the closest hospital, trauma-designated or not, in an effort to not leave their EMS zone uncovered while transporting to a distant, more appropriate trauma center. This has resulted in delays to definitive care as there is also limited ground resources for interfacility transfers. Additionally, some non-designated facilities are refusing trauma patients, even patients with immediate need for stabilization. An important process for patient resuscitation and care is the use of a “rescue stop” where a patient can be stabilized (e.g., chest tube, blood initiation) before EMS continues transport to a trauma center.

The use of a Regional Medical Operations Center (RMOC) is an important resource for patient movement, especially to help facilitate patient load-balancing. Currently, the Georgia Coordinating Center (GCC), housed at Grady Memorial Hospital, operates as an RMOC for the metro Atlanta region. With the prevalence of divert status at many of the larger hospitals in the system, load-balancing coordination is vital to ensure system stability. The use of the GCC statewide has not been adopted for a variety of reasons including the lack of an independent governance entity. Further, RMOC development would be beneficial for patient movement within the system.

Ongoing, real-time monitoring of the system through standardized reporting of time to definitive care and under/over-triage rates is currently not being performed. With the high prevalence of divert status within the system, monitoring of patient movement and barriers to timely care need to be identified and remediated. Development of a repatriation process to move patients back to the local hospitals from the trauma centers once medically stable would help with load-balancing and divert status.

There has been an increase in air medical providers in the state over the last decade, and there appears to be an adequate number of aircraft within or surrounding the state. However, there may be a maldistribution as the southern portion of the state has less saturation, and aircrafts are covering larger response areas.

Recommendations

5.3.1. ***Develop standardized regional destination protocols including appropriate patient transport to Level IV centers. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)***

5.3.2. **Develop an RMOC structure statewide for resource monitoring, patient transport, transfers, and load-balancing.**

5.3.3. *Establish state criteria for trauma center diversion with regional adoption of notification plans and time frames for diversion. Make diversion a reportable event. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.3.4. Develop a process for rescue stops and accelerated transfers.

5.3.5. Evaluate and address lack of ground interfacility transfer resources, especially in the rural areas.

5.3.6. Develop a process for repatriation of patients back to local hospital once medically stable.

5.3.7. Evaluate air medical resource distribution and provide incentive for repositioning aircraft to underserved areas.

5.3.8. Monitor over/under-triage rates and time to definitive care.

5.4 Definitive Care Facilities

Purpose and Rationale

The goal of the inclusive trauma system is one where patient needs are matched to available resources and capabilities. Inclusive trauma systems include all health care facilities, where each hospital contributes to the best of its ability to meet patient needs. Thus, as the core of a regional trauma system, acute care facilities operating within an inclusive trauma system may provide definitive care to the entire spectrum of patients with traumatic injuries or deliver initial stabilizing care before transferring to a facility better matched for higher patient acuity. Acute care facilities should be well integrated into the continuum of care, including prevention and rehabilitation, and operate as part of a network of trauma-receiving hospitals. All acute care facilities, both designated and non-designated, 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 readiness through mutual operational agreements to address interfacility transfer, educational support, and outreach. The roles of all definitive care facilities, including non-designated hospitals, designated trauma centers, and specialty hospitals (e.g., pediatric and burn) should be clearly outlined in the state or 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 trauma system. The system should have a funding source for expected leadership activities by facilities providing trauma care.

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 facilities within their community, whereas the most severe injuries 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 major injuries and have a system in place for the most efficient and 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 to review and verify 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 verified/designated centers do not meet set standards, there should be a process for remediation. This should include corrective action plans, probation, and ultimately accountability through suspension, revocation, or de-designation.

Designation by the lead agency should be restricted to facilities meeting criteria or statewide resource and quality standards and based on patient care needs in the regional trauma system. There should be a well-defined regulatory relationship between the lead agency, designated trauma facilities, and non-designated acute care 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 acute care facility.

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 clinical professionals 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. 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 should 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 by sponsoring multidisciplinary annual educational events. These activities foster teamwork and cooperation in a functional, 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 supported by the state and/or regional trauma plan and facilitated 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, strategic planning, and education of legislators and the public. In addition, the trauma program and subspecialty leaders should provide direction and oversight for the development, implementation, and monitoring of integrated care protocols used throughout the system. The highest-level trauma facilities should provide leadership of the regional trauma committees through their trauma program medical leadership. These medical leaders can assist the lead agency and help ensure that opportunities to improve the quality of care within the system are recognized and corrected. Educational outreach by these higher-level centers should be used as appropriate to help achieve this goal.

Current Status

Within the Georgia State Trauma System, there are currently four Level I, eight Level II, eight Level III, and nine Level IV adult centers. In addition, there is one Level I and two Level II pediatric trauma centers, and two burn centers. The Georgia Trauma Commission (GTC) instituted a requirement that all Level I-III centers become ACS verified to receive GTC funds. The deadline for verification is June 2023 for Level I and II centers and June 2025 for Level III centers. The trauma centers have a good and open working collaboration between each other. They all contribute to the trauma registries and are committed to quality improvement as evidenced by the Georgia Quality Improvement Program (GQIP). An effort is underway to support Level IV competency by training Level IV providers in MARCH PAWS.

However, there is evidence that the trauma system and definitive care facilities in Georgia are underperforming. The State of Georgia had a Trauma System Consultation by the ACS in 2009. Recommendations included establishing clear designation criteria modelled on ACS verification standards, and to apply standards consistently to all centers to ensure quality care is delivered. The designation process remains unremediated. Designation criteria are unevenly applied and

enforced. Approximately 40% of centers had not received a visit in nine or more years, and only one-quarter had received a visit within three years (which is the national benchmark). As designation criteria were not routinely enforced, centers were penalized by the GTC by withholding pay-for-performance funding. Designation in Georgia remains a voluntary decision for hospitals. In the context of a low trauma center funding budget, there is little financial incentive for participation.

Since the 2009 ACS system consultation visit, several definitive care facilities have participated in an external review process through the ACS Verification, Review, and Consultation Program. As discussed above, all Level I-III trauma centers in the state are at some stage in the process of undergoing ACS verification. There are centers that are struggling to meet trauma center verification criteria. The state also consulted the Pennsylvania Trauma System Foundation (PTSF) to specifically evaluate the Level IV trauma centers. While the PTSF identified that the Level IV trauma centers were highly committed, there was substantial variability and lack of standardization in care and processes. This extended to EMS who were unaware of the purpose and capabilities of Level IV trauma centers. Because of the exclusive nature of the Georgia system, non-designated centers receive little support or guidance to participate in the system. Some of the rural EDs are staffed by physicians with no background to treat trauma and there has been limited training available to them to support this capability.

The challenges highlighted by external reviews are likely due, at least in part, to the fact that Georgia trauma centers historically have had somewhat limited experience with external trauma center evaluation and regular designation reviews. As such, these centers are on the steep portion of the learning curve. Whether the trauma system leadership chooses to use external reviews or revise its process, the OEMST will need to develop a rigorous system of accountability and compliance for its designation process. This includes such processes as: the creation of definitions for compliance with designation criteria, timelines for turnaround of trauma center designation requests (national standards are approximately 30-60 days), and putting systems in place to ensure review every three years. System leadership should invest in assisting centers to address deficiencies and assure there are the resources necessary to serve injured patients in a manner that meets national standards. This includes funding for education, particularly for rural providers in small facilities who may not have a background in emergency medicine or training that supports the care of injured patients. The state needs to ensure maintenance of competency by requiring standards for credentialing and certification of physicians.

Additionally, given the relatively under-resourced status of the trauma system, the lead agencies should also help educate centers on trauma system finances so that revenue generating opportunities are not missed. For example, there was lack of clarity by many centers on when they could charge trauma activation fees. Many small hospitals that consider designation do not fully understand the finances. This type of financial guidance would help the system gear up to address system needs by reducing the barriers for designation.

There is evidence that all hospitals in Georgia, including trauma centers, are under substantial strain due to high capacity and low funding, as evidenced by such findings such as frequent and high rates of diversion, and long “wall times” for EMS. The situation is worsened by lack of balance loading across the system. Capacity issues are also considered locally, with lack of visibility or a process in place for accessing resources in neighboring Georgia trauma regions. The system should engage in periodic workforce assessments to inform trauma system goals and development.

Recommendations

5.4.1. **Develop and implement a structured process which ensures accountability, compliance, and consistency in the designation of trauma centers including:**
- **Compliance with designation criteria**
- **Processing of designation applications by the lead agency within 60 days**
- **Creation of systems to ensure every facility completes designation review every 3 years.**

5.4.2. *Apply designation criteria consistently across all centers. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.4.3. Adhere to established designation criteria and quality standards.

5.4.4. Align funding with designation processes to properly incentivize participation in the trauma system.

5.4.5. *Re-evaluate whether designation should remain a voluntary process and consider tying participation to hospital licensure. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.4.6. Load-balance across the system to improve overall system capacity.

5.4.7. Establish standards, criteria, and expectations for diversion. Tie metrics for diversion to the designation and funding processes.

5.4.8. Provide education, support, and resources for centers interested in obtaining designation.

5.4.9. Ensure maintenance of competency by requiring standards for credentialing and certification of physicians.

5.4.10. Provide centers with guidance on trauma center finance (e.g., guidance/policies around trauma center activation fees that are consistent with CMS rules).

5.4.11. Perform periodic workforce assessments which should inform trauma system goals and development.

5.4.12. Recruit new rural hospitals for designation to expand current fragmented system.

5.5 Rehabilitation

Purpose and Rationale

An integral component of the trauma system includes rehabilitation services provided across a spectrum of injury care, including acute care, inpatient rehabilitation, and community-based services. The goals of these services are to provide coordinated care for trauma patients through rehabilitative programs that enhance recovery and speed of return to the highest level of function while reducing disability. Rehabilitative interventions require an integrated knowledge of both medical and ancillary support services, particularly in the context of social determinants of health and their relationship to functional outcomes for trauma survivors. Post-acute and community-based rehabilitation services also should focus on the management of chronic conditions related to the injuries sustained, optimizing long term function, and supporting secondary prevention.

The rehabilitation process should begin in the acute care facility as soon as possible, ideally within the first 24 hours, and should integrate discharge planning and wrap around services to alleviate barriers to rehabilitation access. Inpatient rehabilitation providers should be an active part of acute trauma care management. These professionals are integral to determining each patient's next level of care and functional needs and offering prognostic input about long term functional needs and services. Rehabilitation programs should utilize best practices supported by published guidelines and recommendations for the provision of high-quality rehabilitation care. Trauma systems should include subspecialty rehabilitation services for care involving patients with SCI, TBI, and burns. Additionally, the trauma system should conduct a rehabilitation needs assessment (including specialized programs for SCI, TBI, and children) to identify the number of beds needed for rehabilitation in the geographic region and to ensure that appropriately trained staff are available at centers to meet the needs. 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 are across state lines, should be part of rehabilitation system planning. Feedback on functional outcomes after rehabilitation should be made available to the trauma centers.

Current Status

Much of the information presented in the previous 2009 consultation report is still applicable. There are 13 rehabilitation hospitals currently accredited by the Commission on Accreditation of Rehabilitation Facilities (CARF). Georgia has numerous rehabilitation facilities with subspecialties including pediatric, brain, and spine. The Shepherd Center, located in Atlanta, is nationally recognized for excellence in brain and spinal cord injury care. Rehabilitation providers (physiatrists) did participate in the current review process.

The rehabilitation system is not well integrated in the Georgia Trauma System, which was noted by reviewers in the 2009 ACS Georgia Trauma System Consultation. Rehabilitation services are utilized on an individual hospital basis. During the review, the physiatrists emphasized an

underutilization of the available rehabilitation services in Georgia. This was highlighted by noting that less than two percent of traumatic brain injury (TBI) patients in Georgia use inpatient rehabilitation services. However, there has been no comprehensive resource needs assessment of rehabilitation services for trauma patients to quantify the use or underuse of services, and the associated impact. A needs assessment would not only allow for the identification of opportunities to improve outcomes for the injured Georgia population but would also provide information which could be used for advocacy. For example, if under-insurance status is a barrier to accessing rehabilitation, this could be addressed through legislation at the state or county levels.

Minimal collaboration exists between the trauma system leadership and the rehabilitation centers/physiatrists. No specific standards, guidelines, or transfer agreements regarding rehabilitation services were reported. Minimum requirements and qualifications for rehabilitation centers caring for the severely injured patient are not defined by the trauma system. These were similarly noted in the 2009 report.

These limitations result in downstream barriers for injured patients in Georgia in gaining access to rehabilitation. It was noted that another barrier affecting patient flow is longer-than-anticipated delay once the decision has been made that a patient qualifies for rehabilitation. The delay appears to be caused by a prolonged Medicaid application process for the uninsured and a delay in initiating insurance preauthorization for those with private insurance. A substantially high proportion of the Georgia population falls below the federal poverty threshold and is uninsured when compared to the United States, greater hindering the possibility of inpatient rehab services regionally. This disparity is worsened in rural areas, where it has been estimated that almost 25% of the population are uninsured.

Recommendations

5.5.1. Create a collaboration between the trauma system leadership and rehabilitation centers/providers to increase accessibility and availability of inpatient rehabilitation services for the severely injured patient throughout Georgia.

5.5.2. Optimize the transition process from the acute inpatient setting to rehabilitation from both a timing and funding source allocation perspective.

5.5.3. *Develop inpatient rehabilitation transfer recommendations and guidelines for the statewide trauma system. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.5.4. *Define minimum requirements and qualifications for inpatient rehabilitation centers caring for injured patients. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.5.5. *Perform a comprehensive resource needs assessment of rehabilitation services for trauma patients, especially for traumatic brain injuries, spinal cord injuries, and pediatric patients. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.5.6. *Include the rehabilitation phase of care in a system performance improvement process using appropriate indicators and benchmarks. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

5.5.7. Work with payers and governmental agencies to improve access to rehabilitation services in a timely manner.

5.6 System Integration

Purpose and Rationale

For the system to function optimally, trauma care must be integrated into the larger public health framework. A trauma system should have a plan, overseen by the lead agency, that specifies how the various components work together to achieve the intended goals and discusses how integration and cooperation from the time of injury through ultimate repatriation will be achieved. The system must also work to identify and eliminate health care disparities. Using this public health approach, the trauma system should aim to reduce the burden of injury in a state or region. In addition, this approach enables the trauma system to address primary, secondary, and tertiary injury prevention by mobilizing community partnerships.

Trauma system integration is essential for the daily care of injured people. Coordinated activity among emergency medical services, definitive care institutions, and rehabilitation centers ensures optimal care of the injured patient. This care, however, must be augmented by other essential services and partners, including mental health providers, social services, child protection, public safety, and disaster response and recovery. The system needs to be on alert for disparities, bias, and lesser outcomes of vulnerable populations. Collaboration with the public health community provides access to epidemiologic data that can be used for system assessment, development of public policy, and informing and educating the community.

Each element of the trauma system, through its leadership, should participate in trauma system design, evaluation, and operation. This participation should include policy and legislative development, public education, and strategic planning. In addition, trauma and subspecialty leaders should provide direction and oversight to the development, implementation, and monitoring of integrated protocols for patient care used throughout the system (e.g., TBI guidelines used by prehospital professionals and non-designated transferring centers). This should also include region-specific primary and secondary triage protocols. Trauma leadership, through regional trauma committees, can assist the lead agency and help ensure that system deficiencies in the quality of care, relative to national standards, are recognized and corrected.

The increasing level of threats to our society, such as mass violence, terrorist attacks, infectious diseases, and natural disasters, underscore the importance of trauma system integration. The trauma system is a significant state or regional resource for the response to mass casualty incidents. It has been demonstrated that communities supported by developed regional trauma systems are more organized and better able to respond these events. The impact of disasters and mass casualty incidents (MCIs) on the functioning of trauma centers, EMS, and public health systems within an affected region or state must be considered in the joint planning for optimal use of all resources to enable a coordinated response through recovery.

Current Status

The Georgia State Trauma System has not fully embraced the philosophy of an inclusive trauma system. Due to forces applied by limited funding, resource constraints, culture, and hospital capacity and capability issues, the system relies on an antiquated and inefficient exclusive trauma system model. Several discrete impediments exist which limit adopting the inclusive system model including fragmented leadership organizations, inconsistent Regional

Trauma Advisory Council (RTAC) operational plans, the lack of a multidisciplinary advisory group, an outdated rudimentary trauma system plan, and the limited recognition and attention given the trauma system challenges of the rural environment. Without substantive infrastructure, operational guidance, and a broad vision, there is limited architecture upon which to promote trauma system integration.

Trauma centers are apportioned across the state including four Level I trauma centers, one pediatric Level I trauma center, eight Level II trauma centers, two Level II pediatric trauma centers, eight Level III trauma centers, nine Level IV trauma centers, and two burn centers. Higher tier trauma centers are distributed to major urban areas with a significant concentration of Level I-III trauma centers in the greater Atlanta metropolitan region. There are significant areas of rural southern and northeastern Georgia with little to no trauma center coverage. There are 37 rural hospitals and 30 critical access hospitals across the Georgia landscape, but few of these participate in the trauma system as a non-designated hospital. EMS agencies, particularly those in rural Georgia, struggle to support the trauma system due to funding and resource limitations leading to personnel shortages, delayed dispatch times, and overreliance on mutual aid (which is often also over encumbered). In addition, the crisis with hospital capacity and diversion is associated with prolonged “wall times” and routinely delayed transport to definitive care. Many of these hospital and EMS factors, independently and in combination, likely have a deleterious impact on injured patient outcomes, including potentially preventable trauma mortality.

The trauma system has not effectively leveraged partnerships with numerous stakeholders necessary to optimize trauma system function including public health, law enforcement, social services, and the public. The system does foster a modicum of legislative advocacy for the trauma system sustainment through the efforts of the Georgia Trauma Commission, which actively engages the legislature. In addition, accessory efforts to promote legislation supporting the trauma system emanate from the emergency medicine physician lobby and the Georgia Hospital Association. Though the legislative efforts have managed to garner $21,000,000, this amount is insufficient to meet the needs of the Georgia Trauma System.

The Trauma System Plan, which provides a roadmap to drive the various components to work together, is out of date and must be reworked by a broad, inclusive stakeholder group to optimize its utility. Additionally, unlike the previous iteration, the Trauma System Plan must be widely disseminated and accessible to all trauma system stakeholders. As the Georgia Trauma System matures, it must be maintained by a strong and defined leadership structure. The leadership must promulgate the next phase in the development of the Georgia Trauma System utilizing a strategy of maximally inclusive trauma system stakeholder engagement. Trauma system stakeholders must educate the public and state legislators about the public health value of the trauma system in Georgia to potentiate support and funding for comprehensive trauma system development and sustainment. Clearly defined roles and operational guidance should be developed for the Regional Trauma Advisory Councils (RTACs). Furthermore, the RTACs should work together to foster subsequent advances in the trauma system. Communications between the system leadership, RTACs, trauma centers, and EMS should be transparent, collaborative, and bidirectional.

Recommendations

5.6.1. Develop and maintain a strategy of maximally inclusive trauma system stakeholder engagement to support trauma system development.
    - Utilize stakeholder engagement to educate public and state legislators about the public health value of the trauma system in Georgia to promulgate support and funding for comprehensive trauma system development and sustainment.

5.6.2. Organize Regional Trauma Advisory Councils (RTACs) into the system structure to optimize operational value for trauma system development.

5.6.3. Establish uniform operational plans to support the operations of all Regional Trauma Advisory Councils (RTACs).

5.6.4. Improve collaboration and bidirectional communication across the breadth of trauma system stakeholders.

Essential Trauma System Element #6: Needs Based Designation

The lead agency should develop and administer a trauma center designation process, which is based upon population needs.

Purpose and Rationale

Regional trauma system implementation has been shown to improve mortality and reduce complications. The number, level, and location of trauma centers are critical elements of trauma system function and disaster response. The importance of controlling the allocation of trauma centers, as well as the need for a process to designate trauma centers based upon regional population need, has been recognized as an essential component of trauma system design since the 1980's.

The designation of trauma centers is the responsibility of the lead agency, with input from the multidisciplinary advisory group. The lead agency must have a strong mandate, clear statutory authority, and the political will to execute this responsibility. In determining number, level, and location of trauma centers, the lead agency must be guided by the local needs of the region for which it provides oversight. The applicability of specific metrics and benchmarks for establishment of need will vary depending on the unique attributes of the region. Furthermore, the needs of patients must be optimized, and it is the professional obligation of health care professionals, facilities, and political leaders to work together to ensure that patient's needs come first. Assessment determinations should be transparent and derived through a broad-based, locally driven consensus process that is balanced, fair, and equitable.

Utilizing the inclusive trauma system model, the number and location of trauma centers by level of designation and integration of non-designated 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, with the appropriate statutory authority, for identifying the appropriate number and/or level of trauma centers based on these periodic assessments. The trauma system plan should address means for improving the participation of both designated and non-designated acute care facilities to improve access to injury care within the trauma system.

Current Status

The GTC has conducted needs-based assessments of the trauma system. Two of these assessments used the first and second ACS NBATS tools, and findings were published in academic journals (2018 and 2021). However, the primary findings from these two studies highlight limitations of the NBATS tool, rather than provide insights into limitations of the system.

The State has access to hospital discharge data which they have used for injury analyses. For example, in an analysis of data from 2003-2012, the GTC estimated that 85% of severely injured patients (defined by an ICISS of <0.85) were cared for in designated trauma centers (Levels I-IV). It is not clear if these numbers have been stable over time. Statewide trauma registry data does reveal rates of under-triage within the system, with 94% of patients with ISS>15 at Georgia trauma centers receiving care at Level I or II centers. Actual statewide rates of under-triage within the state are not known.

The numbers that are known also likely underestimate the burden of need. Hospital capacity issues across the state were frequently cited. Diversion, which is left to the discretion of hospitals, is common across the system. A review of the Georgia Coordinating Center website (https://georgiarcc.org/), while not kept up to date for all hospitals, confirms this with almost all Level I-III centers indicating high capacity. EMS services experience long "wall times," which worsen resource constraints. Furthermore, in rural areas without ready access to Level I-III centers, it is not uncommon for patients to be taken to non-designated centers. These limitations are exacerbated by strained EMS resources that limit primary triage to more distant centers and interfacility transfer. Finally, another needs-based challenge faced by Georgia is that there are areas of need where no hospitals currently exist. This need has not been formally characterized or quantified. These empiric observations suggest a high degree of strain throughout the system that is not captured by current or past evaluations, highlighting the importance and need for needs-based assessments.

Further, there is no formal process that can act on needs-based information. In a previous assessment by the GTC, the selection of centers was complicated by concerns around who should qualify for funding, as well as the fact that designation falls to the responsibility of the OEMST. Overall, despite available data and analyses, there have not been regular and effective needs-based analyses that provide actionable insights that inform the state of the Georgia Trauma System.

The State does have access to statewide discharge and trauma registry data and has the capability to generate actionable insights from these data. Quantifying the need across the system in a regular, standardized fashion would inform the system, as well as provide data to support funding decisions from government bodies. Gaps or weaknesses in coverage should be coupled with a process for designation.

Recommendations

6.1. Create a transparent structure and process to take the system from assessment of need, to identification/selection of centers for designation, and through the designation process.

6.2. Regularly assess trauma center number, level, and location adequacy by assessing patient need.

6.3. Identify areas of need where there are no hospitals which can be designated and identify alternative mechanisms to ensure appropriate trauma care can be delivered (e.g., use of telehealth, air ambulance).

Essential Trauma System Element #7: Trauma System Registry

The lead agency should have the authority to establish and maintain a trauma system registry to collect, validate, and analyze injury surveillance data. Data collection should include the full continuum of care from point of injury through rehabilitation. These data should include all care facilities that treat injured patients. These data should be integrated with other data collection systems (i.e., vital records, medical examiner, law enforcement, and rehabilitation). Data definitions and patient inclusion criteria should be standardized to a national standard. Data sharing should be inclusive of system stakeholders to support quality improvement, research efforts, and legislative outreach pertaining to trauma.

Purpose and Rationale

There should be sufficient legal authority to establish a lead trauma system agency that can collect, validate, analyze, and distribute data. This legislative mandate should provide for collaboration, coordination, and integration with other entities engaged in providing care or surveillance activities related to the care of the injured patient. The lead agency should be authorized in statute to develop rules for the collection, analysis, use, and distribution of data within the system.

The lead agency should establish and maintain oversight of a single, system-wide trauma registry that collates and links hospital-level data with other data collection systems into one accessible data set to assess trauma system quality and outcomes. These data should guide planning, development, and maintenance of the trauma system during all phases of care. This system-wide trauma registry should meet national data collection standards and utilize current technology. Data collection should encompass the full continuum of care from point of injury to transport, hospitalization, rehabilitation, and return to community. Data collection should focus on identifying individual patients and linking patient-level data across the continuum of care among all relevant databases. Quality system information and data to support trauma system metrics should be provided by all those involved in a patient's care (pre-hospital, critical access facilities, transferring hospitals, trauma centers, rehabilitation, skilled nursing facilities, and therapy services).

The lead agency should define those responsible for contributing data and outline submission requirements such as demographics, mechanism of injury, diagnoses, treatment, and long-term outcomes. The lead agency should facilitate and foster integration of data collection systems with the addition of administrative discharge data, vital statistics data (government records), death certificates, medical examiner records, law enforcement, and financial data to add additional perspectives. Data collection processes designed by the lead agency should address the accuracy, timeliness, standardization, quality, validation, confidentiality, and completeness of the submitted data. An optimal information reporting process includes standardized reporting tools that allow for the assessment of historical and/or system changes and a dynamic reporting tool that permits the ability to tailor specific "views" of the information.

Research drives development of the trauma system, defines evidence based best practices, and provides a foundation for system growth and improvement. Trauma research should be facilitated and encouraged through processes designed to make data available to investigators. The lead agency should have a protocol to address requests for research data and have a method for evaluating these requests in a timely manner. While most lead agencies will not have the resources to maintain a self-contained board to meet federal human subjects research standards, they should develop relationships with Institutional Review Boards that can provide this service. Grants or contracts through the lead agency or constituencies may provide funds to support research activities.

Current Status

The established trauma rules require each designated trauma center to submit data to the state trauma registry in a manner and frequency as prescribed by OEMST. The state rules require that all information reported to the registry be deemed confidential. OEMST has the authority to release specific reports or data in a de-identified form for research purposes, or other data needs, at its discretion. Data cannot be released in a manner that allows identification of any hospital, institution, or clinic.

The Georgia OEMST has a multi-system platform through ImageTrend that provides the opportunity to accept data from different systems of care including Cardiac, Stroke, Trauma, EMSC, and EMS. The GEMSIS, Elite, and Hub are the platforms for the EMS data registries. The Georgia Trauma Patient Registry (GTPR) is the platform for the new trauma central site for the Department. The License Management System on the same platform allows the OMEST to manage EMS agencies, licensed providers, evaluate reports for trauma center designation, and approve designations.

On October 1, 2021, OEMST discontinued the Digital Innovation V5 Georgia Trauma Registry central site. On that same day, OEMST implemented the GTPR on the ImageTrend platform. Trauma center users have separate logins to access EMS records and import data to the GTPR. Data linkage is possible between the GEMSIS Hub data and the GTPR with matching key data elements and probabilistic linkage. Direct trauma data entry is available on the GTPR platform at no cost to the trauma center. The direct data entry trauma registry has validation rules to ensure the integrity of the trauma data.

The Georgia Quality Improvement Program (GQIP) is continuing to develop a state central site for hospital performance improvement utilizing data from the trauma centers. This site collates data, addresses data quality, and de-identifies the registry data before sending it to ArborMetrix, the risk-adjusted benchmarking platform.

OEMST has oversight of the Georgia Trauma Patient Registry on the ImageTrend platform. GQIP has oversight of the Trauma Registry on the ESO Digital Innovation V5 platform. These two databases require the trauma centers to submit data to three different databases: OEMST, GTC, and the database used for NTDB/TQIP. This creates an undue, unnecessary burden for the trauma centers.

Trauma registry data completeness is monitored to highlight data entry errors and missing required data. The ESO DI V5 software uses a validation tool to notify users of errors before closing the record. Users can view each record and the individual record completion rate. OEMST monitors trauma registry data timeliness and record closure rates through the quarterly OTCPE report submitted by the trauma center. The acceptable average quarterly record closure rate is 80% or above. The trauma center verifies for the Department whether the center meets the standard. The GTPR does not contain record closure date and times; therefore, the department must receive a copy of the ESO DI V5 generated record closure rate report in addition to the center verifying the quarterly rate. Trauma centers can run the ESO DI V5 report as frequently as they desire to monitor their own record closure rate as a performance improvement measure. OEMST and GTC GQIP collaborate to ensure the data registries contain the NTDS-required fields and data elements needed to monitor trauma care statewide. The data completeness standard is 80% or above for required data elements by NTDS and OEMST. For

data fields needed for robust risk adjustment models, GQIP will require a data completeness standard of 90% to align with the TQIP model, creating a variance between the two organizations. Additionally, rural Level IV centers are novices at the registry and may not have the volume to maintain competencies in injury coding to calculate an accurate ISS, which impacts data integrity. These centers need mentorship from the Level I/II centers.

The OEMST epidemiologist works with other DPH sections by providing trauma registry data for probabilistic linkages to the hospital discharge data set and the CODES (Crash Outcomes Data Evaluation System) data set. The CODES data set includes MVC or incident, EMS, hospital discharge, and trauma registry data. This data integration is sponsored by NHTSA.

The new ImageTrend Georgia Trauma Patient Registry records can be linked to EMS records to import EMS data into the trauma registry record. The linkage is done manually, by record, as the user searches the EMS database for matching date of birth, EMS agency numbers, EMS PCR numbers, dates of service, and the trauma center providing the care. Trauma centers have the option of linking their Hospital Information Systems to their internal trauma registry. The linkage is established by the hospital information technology department and the ESO DI V5 software vendor. This opportunity decreases the registry workload burden for the facilities.

Data available does not reflect an inclusive system. No specific rehabilitation data is collected currently, creating a non-inclusive data set. Additionally, data to reflect pediatric or geriatric outcomes is not available.

OEMST has a dedicated state trauma registrar who is knowledgeable of the registry and report writing for the registry. OEMST has a history of publishing an annual trauma registry report, with the last report completed in 2019. However, stakeholder input into data reports is minimal.

Recommendations

7.1. **Develop a collaborative stakeholder data use workgroup to define data needs required to evaluate and manage the trauma system.**

7.2. Create a stakeholder group to explore options to decrease the burden of submitting data to the three registries.

7.3. Evaluate options for the trauma centers to automate registry processes and data linkage.

7.4. Develop reports to:
- Review the EMS transfer transport times regarding time requests, time at hospital, and time to definitive care facility to identify trends and opportunities for improvement.
- Evaluate the time to definitive care for the trauma centers and the trauma system.
- Review the incidence and causes of pediatric trauma injuries and trauma deaths.
- Review the incidence and causes of geriatric trauma injuries and trauma deaths.
- Create annual trauma registry reports.

7.5. Enable stakeholders to develop specific reports and request data for the RTACs designed to evaluate the system response.

7.6. Integrate data from the other resources such as rehabilitation, GVDRS, and the coroner's office to foster an inclusive data system.

7.7. Develop systems to assist the Level IV centers manage and complete the registry requirements for designation to include injury coding to calculate an accurate ISS, which impacts data integrity.

Essential Trauma System Element #8: Injury Epidemiology

The lead agency should have systems and processes in place to regularly track and report on injury frequency, rates, and patterns across the entire jurisdictional population. Analysis and reporting should be based on multiple pertinent data sources (e.g., vital statistics, hospital discharge data, EMS, ED data, and trauma registries), including information obtained through surveillance activities. Data from these sources should be synthesized to provide a comprehensive description of injury and analyzed to identify trends and patterns to inform system development, injury prevention, and performance improvement efforts.

Purpose and Rationale

Trauma leaders and public health officials should collaboratively use injury surveillance data and outcome measures to describe and monitor injury events and emerging injury trends in their jurisdictions. This information will enable trauma system leaders to identify emerging threats that call for a reassessment of priorities and/or reallocation of resources. In addition, the data should be used to assist in ongoing planning, implementation, and evaluation of public health interventions and programs, to include disaster response. The trauma system, in conjunction with the system's epidemiologist, should complete a periodic trauma risk assessment and gap analysis using all available data to establish policy and develop an injury prevention and control plan.

Reducing injury related morbidity and mortality is the measure of success of a trauma system. Data from the system-wide registry and other sources must support injury epidemiology efforts with a focus on the frequency, rates, and injury pattern events in a population. Injury pattern refers to the occurrence of injury-related events by time, place, and personal characteristics, including demographic factors, pre-existing conditions, behavioral influences (e.g., protective device use), and environmental exposures. This provides a relatively simple form of risk-factor assessment. System data should be used to identify the burden of injury across specific population groups (e.g., children, elderly, races, and ethnicities) to ensure that specific needs or risk factors are identified. The lead agency should distribute this epidemiologic information to the public and government at least annually and upon reasonable request.

Current Status

Georgia utilizes many data sources for injury epidemiology including the Georgia hospital discharge dataset, Georgia Vital Statistics, emergency discharge data, Georgia trauma registries (one at the OEMST and two with GTC), Georgia Violent Death Reporting System (GVDRS), the EMS registry, and data from the Georgia Department of Transportation (motor vehicle crash data). Injury epidemiology is overseen by the Georgia Department of Public Health (DPH). Epidemiologic support exists within the Office of Preparedness' Section of Injury Prevention. OEMST has designated use of an epidemiologist, which has been a change since the 2009 Trauma System Consultation. The GTC does not conduct epidemiology analyses from the registry data but uses the two registries for hospital quality improvement.

The Georgia Traffic Safety Facts (GTSF) is produced by the Crash Outcome Data Evaluation System (CODES). This process links crash and vehicle data along with risk and protective factors to their medical and financial outcomes. CODES uses probabilistic techniques for complex linkage of data for analysis. The OEMST also changed registry systems to link EMS

data with trauma registry data but has not done so. Given the significance of motor vehicle traffic fatalities and injuries in the state, these systems have the potential to provide helpful epidemiologic information around motor vehicle traffic collisions.

There is evidence that injury epidemiology has been used to improve care and initiate injury prevention programs by the DPH. Data has been used as the foundation of a robust fall prevention program created by the DPH. Extensive data on traffic related injuries and mortality is frequently reported by Georgia Traffic Records Coordinating Committee (Georgia Traffic Records Strategic Plan).

However, the most recent report regarding trauma specific injury epidemiology was in 2010. The prior review recommended a biennial trauma related report be generated, which has not come to fruition.

The DPH currently does not have a trauma medical director or a state trauma advisory council. The lack of content expertise hinders leadership, and thus direction. As a result, there is robust data and reporting of specific injury frequencies, but limited use of the data by trauma-related entities.

Data is not consistently distributed or utilized by trauma-related entities, such as the RTACs. There is a process by which data can be requested; however, the process seems challenging. This limits researchers and others interested in quality improvement from using the rich epidemiologic data sources at the DPH to improve care.

Georgia has a heterogenous population encompassing a large land mass. The OEMST and GTC have not specifically addressed trauma-related data to support the state's diversity in the context of social determinants of health.

Recommendations

8.1. Develop a method for timely and efficient distribution of injury epidemiology related data and reports through the RTAC system.

8.2. Utilize injury epidemiology data for injury prevention, education, and advocacy.

8.3. Integrate the social determinants of health into reporting as it pertains to the injured patient.

8.4. *Prepare and publish a report regarding trauma specific injury epidemiology on a biennial basis. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)*

Essential Trauma System Element #9: System-Wide Performance Improvement

The lead agency should establish a system-wide trauma performance improvement (PI) process to evaluate all aspects of the trauma system. The plan should define audit filters to monitor and track specific processes and outcomes, such as access to care, availability of services, and effectiveness of injury prevention initiatives. In addition, the plan should define a process for tracking of the audit filters, addressing performance gaps, and determining loop closure.

Purpose and Rationale

The trauma lead agency has responsibility for instituting and analyzing the structure, processes, and outcomes to evaluate the performance of all aspects of the trauma system. Appropriate data should be collected to identify opportunities for PI in the system and to develop action plans with measurable outcomes. These data should be used to monitor PI efforts and effectiveness of corrective action within the system at all levels of care. Dedicated regional staff and resources should be available to ensure time-sensitive reporting of information to stakeholders.

The lead agency should design trauma system performance indicators with meaningful accountability-based incentives focused on achieving defined quality goals. These will act to ensure the support of key constituents in the health care community and the general population. The trauma lead agency should promote ongoing dialogue with key stakeholders, ensuring that any initiatives remain aligned with system needs. Success is enhanced when all system participants consistently comply with the guidelines and can evaluate performance in a confidential manner.

The lead agency should use data to generate reports and conduct analyses regularly. These reports should use data that compare cohort outcomes (e.g., adult/pediatric, varying trauma center levels, urban/rural) using risk adjusted benchmarking. An optimal information reporting process should include standardized reporting tools that allow for the assessment of system changes over time. This dynamic reporting tool should permit stakeholders to tailor data analysis and focus on vulnerable or frequently encountered cohorts (groups based on age, injury patterns, or outcomes). The lead agency should provide regularly generated reports that support trauma system operations by evaluating trauma system performance and processes of care.

Current Status

A defined, documented trauma system performance improvement plan for the Georgia Trauma System is not developed. This is a significant weakness in the system. The trauma system performance improvement plan should be implemented by the lead agency.

Data collection occurs within OEMST and GTC. GTC has a strong focus on the trauma center data and performance improvement processes. The Georgia Quality Improvement Program (GQIP) serves as the state's trauma and surgery collaboratives. GQIP began as a contract with an academic medical center. In 2020, GQIP was moved to GTC. From the trauma side, GQIP consists of the trauma program managers and trauma medical directors of Georgia's trauma, burn, and pediatric centers. Before its formalization, the trauma center stakeholders initiated a TQIP collaborative in 2012, utilizing the first collaborative report. The collaborative created a standardized list of audit filters that was implemented by all trauma centers. These efforts

successfully demonstrated a reduction in error rates from 12% to under 5% over five quarters. Since those early projects, the collaborative has developed algorithms for complication identification, an external data validation visit process, and statewide practice management guidelines. Several of these projects have been presented through academic publications or national podium presentations. In conjunction with the GQIP data platform, a risk-adjusted benchmarking platform is in the build phase and scheduled to launch by the second quarter of 2023.

Current PI initiatives include examining transfer to definitive care times and data completeness. However, there is no structured loop closure process. OEMST and GTC have jointly completed various case reviews with centers, but centers have no process to provide action plans and evidence of improvement on identified issues. This exercise demonstrates a need for education, mentorship, and training related to performance improvement and is an identified weakness in the system. Opportunities for EMS to integrate into the hospital performance improvement plans are not defined. Structured feedback to transferring facilities and EMS agencies are not in place. The discussion of a system performance improvement plan led to the review of current statutes specific to discoverability. In 2022, the GTC approved a resolution formalizing the peer protection structure in accordance with the Georgia code.

The GTC has identified the following initiatives to strengthen the performance processes within the GQIP structure:

- To establish, maintain, and administer a trauma center network to coordinate the best use of this state's existing trauma facilities and direct patients to the best available facility for treatment.
- To coordinate and assist in the collection of data to evaluate the provision of trauma care services in Georgia.
- To study the provision of trauma care services in Georgia 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.
- To report any proposed legislative changes to the General Assembly each year. GQIP is in the process of becoming a Patient Safety Organization (PSO) under the GTC by June 2024.

Several initiatives were addressed using the statewide TQIP collaborative reports. Data validity was addressed by audit filter reviews, followed by the development of data collection tools such as complication algorithms and an external data validation process. Ventilator-associated pneumonia (VAP) presented an opportunity for the collaborative to develop a VAP guideline, which was shared with all the trauma centers.

OEMST and GTC, in collaboration, have completed the review of transfers to a higher level of care to assess time from “ditch to door.” High-risk cases with a prolonged length of stay at outlying hospitals were identified, and feedback was obtained from sending and receiving facilities to identify issues. OEMST’s trauma epidemiologist created reports to look at scene and transfer times. Data reviewed included: EMS scene times by ISS and time to definitive care for transfer population by ISS. Each center provides a performance matrix summary from their biannual TQIP reports that is shared with the GQIP leadership team. The summaries are collated to look for trends and high and low outliers. The data includes information for mortality and major hospital events and specific process measures such as time to hip fracture repair.

Through the ongoing trauma center performance evaluation and quarterly reports, OEMST monitors the following:

- registry record closure rate
- over/under triage
- surgeon response
- non-surgical admission rate
- mortality review validation
- multidisciplinary peer review meeting attendance
- trauma operational process improvement meeting attendance

In addition, centers are required to report center-specific metrics that are tracked by GTC. As part of their final annual report, centers must report two example opportunities for improvement with loop closure identified from the peer review process and the system/operations process. The GTC has resources to assist facilities develop their trauma performance improvement plan.

All Level I, II, & III centers are required to participate in TQIP. All trauma, burn, and pediatric centers must participate in GQIP as outlined in their contract. Centers must submit a TQIP performance matrix that includes odds ratios, decile, and outlier status for mortality and major events by cohort. Select process measures (e.g., time to hip fracture repair) are included in the matrix. A similar risk-adjusted benchmarking platform project will provide Level IV centers with information and be able to look at data on a regional level that can give feedback to the RTACs.

All trauma centers that receive GTC funding must participate in biannual meetings for the GQIP collaborative. Meetings are used to review an aggregate of the centers' TQIP performance matrix and TQIP collaborative report to allow stakeholders to have input in focus areas and volunteer to lead initiatives. Meetings are also used to identify and highlight high performers for the purpose of best practice dissemination.

These processes are admirable and are strengths in the system. However, these processes have a heavy emphasis on trauma center review of data. Regional multidisciplinary review of data is limited and only done through the aspects of the hospital trauma registry or the trauma center's TQIP report. There is an opportunity for multidisciplinary collaboration in developing the plan.

System monitoring and evaluation of over and under triage is not consistent. Diversion rates are high across the board, with no evidence of this becoming a major performance improvement initiative for the state.

It is recommended that Georgia develop a trauma system performance improvement plan. This plan needs a correlated data dictionary to ensure consistency in data. A process for plan dissemination, education surrounding stakeholder roles, and tools for implementation should be developed and made a priority.

Lastly, there is an opportunity to mentor and help develop the competency of the Level III and IV trauma center program managers, medical directors, other hospital personnel, and EMS providers in performance improvement.

Recommendations

9.1. ***Develop, implement, and document a systemwide trauma system performance improvement plan. (This was also a recommendation from the 2009 Georgia State Trauma System Consultation.)***

9.2. Utilize funding to support system-wide performance improvement initiatives to evaluate:
- Cause and effect of diversion in the trauma system
- Cause, impact, and outcomes of delays in EMS response to scenes
- Options to expedite trauma care and transfers in the rural areas
- Potentially preventable deaths

9.3. Develop a performance matrix of the requirements of the funding to be integrated with the system performance improvement plan.

9.4. Develop a performance matrix for the RTACs to evaluate regional performance improvement plans that integrate all elements of the trauma system.

9.5. Develop systems for monitoring over and under triage to identify opportunities for improvement.

9.6. Standardize a structured feedback process from receiving trauma centers to the transferring centers and EMS transport agencies.

Essential Trauma System Element #10: Confidentiality and Discoverability

The lead agency should establish a process to ensure confidentiality and provide statutory protection from discoverability to support trauma system performance improvement and research efforts.

Purpose and Rationale

A designated process, with dedicated staff having expertise to protect data confidentiality, should be constructed to maintain privacy and security of any data under trauma system control. Because protected health information, personal identity information, or unique identifiers may be collected, the process must ensure that patient confidentiality is respected and is consistent with state and federal law. Policy should outline how data are requested. Data requests should be reviewed with efforts to ensure compliance with privacy safeguards that prevent improper use or disclosure. Access to information must be limited to only necessary personnel for authorized purposes. Given the sensitivity of this data, the system should also determine when formal patient authorization is required for the release of registry information. There should be a mechanism for feedback to the system regarding the final utilization of the data provided and confirmation of final data disposition.

Trauma system data should be protected in statute from discoverability and used to support trauma system performance improvement and research efforts at the regional, state, and national levels. The lead agency should establish a process with explicit safeguards to ensure confidentiality throughout the performance review process. Statutory provisions should foster system development that permits data sharing, collaboration, coordination, and integration with other agencies and entities engaged in prevention, patient care, and surveillance activities related to care of the injured patient. The lead agency should encourage bi-directional flow of information across the continuum from prevention to pre-hospital and return to the community.

Current Status

Developing statutory and administrative rule for protection of peer review and trauma quality improvement data is essential to assuring trauma system development. The State of Georgia has made substantive efforts to afford confidentiality and protections from discoverability.

Title 31–7 of Georgia state statute provides protection for medical peer review activities. In 1988, the Georgia Attorney General (1988 Op. Att'y Gen. No. 88-5) determined the Trauma Advisory Committee for Emergency Medical Services met the definition of a review organization within the legislative code, and, as such, it is covered by the immunity and confidentiality provisions of O.C.G.A. §§ 31-7-132 and 31-7-133. There is no evidence that the Trauma Advisory Committee for Emergency Medical Services was ever established.

According to the Rules and Regulations of the State of Georgia, Rule 511-9-2-.05(4) was specifically developed to protect confidentiality. All information reported to any registry as described by this Rule shall be deemed confidential, except that the Department of Public Health may, at its discretion, release such reports or data in a de-identified form or for research purposes determined by the Department of Public Health to have scientific merit. Under no circumstances may information reported to any registry as described by this Rule be released in such a manner as to lead to the identification of any hospital, institution, or clinic.

In addition, the Georgia Trauma Commission (GTC) recently passed a resolution (November 2022) creating a trauma best practice subcommittee, the proceedings of which will be protected under Georgia's peer review statutes. This will enable discussions to foster the functionality of the Georgia Quality Improvement Program (GQIP) allowing confidentiality and discoverability protections from open record request regulations.

As the Georgia Trauma System continues to evolve, efforts must be made to sustain statutory and rule protections contemporary with trauma system data and performance improvement activities.

Recommendations

10.1. Amend or develop contemporary statute and administrative rules with specific language to ensure the confidentiality of the trauma registry, trauma system performance improvement, and peer review activities and to protect each from discoverability.

Essential Trauma System Element #11: Disaster Preparedness

A comprehensive emergency disaster preparedness and response plan should be established and reviewed annually. This plan should integrate all components of the trauma system and coordinate with all existing response entities including local, state, federal and particularly military partners. There should be a developed and operational network of Regional Medical Operations Centers (RMOCs) as a major component of the disaster preparedness plan. The plan should be exercised at least semiannually. One of these exercises should be operationally based (not tabletop) and test all components of the system.

Purpose and Rationale

The lead agency, in collaboration with trauma system leaders, needs to be actively involved in disaster preparedness for the local, regional, or national area of responsibility. These system leaders should be the subject matter experts in disaster preparedness to ensure that trauma system resources are optimally integrated across the continuum of the emergency response. A mass casualty incident (MCI) is defined by numbers of casualties that overwhelm available hospital and system resources. Contingent upon the size of the MCI, a plan for activation of a larger emergency response with support provided by region, state, and national assets may be required. In an MCI, acute care facilities (sometimes including one or more trauma centers) within an affected community must be willing to adjust their daily operations to manage the MCI. This plan should be practiced to ensure effective communication between centers and public resources. An assessment of the trauma systems response to simulated incidents or tabletop drills must be conducted and documented on a regular basis to determine the trauma system's ability to respond. Resource assessment of the system should be coupled with a system specific hazard vulnerability analysis to identify gaps requiring remediation.

Complex disasters may mimic the austere environment and logistical challenges faced in military deployments; thus, military resources for evacuation, triage and treatment of the affected population should be incorporated into regional disaster plans if available. Planning and integration of the trauma systems with civilian agencies (public health, law enforcement, EMS and emergency management) and military partners are important because of the extensive impact disasters have on the trauma system and the need for the trauma system to provide care to the local populace. Cooperative relationships between these agencies support the provision of assets that enable a more rapid and organized disaster response on every level.

As a major component of the disaster preparedness plan, there should be a developed, integrated, and functional network of Regional Medical Operations Centers (RMOC). The goal of the RMOC is to strengthen regional care delivery through enhanced resource coordination. The RMOC model is designed to facilitate the most appropriate level of care for as many patients as possible, while simultaneously maintaining patient safety and keeping as many patients as possible within local facilities capable of providing high quality care. The RMOC enables the entirety of a region's healthcare system during any mass casualty or large public health event to "load balance" patient care needs across healthcare facilities and healthcare systems prior to any individual facility transitioning to a crisis standard of care. In addition, it provides a communication link to other RMOCs to lead or participate in a broader coordinated multi-regional, state, or national effort. This includes multi-state response and nationwide network integration.

Current Status

There is limited trauma system infrastructure and resources currently devoted to disaster preparedness. No statewide assessment of the trauma system's emergency preparedness is available. The Georgia Emergency Operations Plan (GEOP) was developed by the Georgia Emergency Management and Homeland Security Agency (GEMA) in coordination with other state agencies, non-governmental organizations, and private sector partners. The GEOP is aligned with the National Incident Management System as well as the National Response Framework and the National Disaster Recovery Framework. The GEOP addresses the 13 hazards and threats extracted from the 2014 Georgia Hazard Mitigation Strategy and the 2018 Georgia Threat and Hazard Identification and Risk Assessment (THIRA). GEMA maintains the GEOP and presents the plan to the Governor for adoption every four years, at a minimum.

Georgia has 14 Healthcare Coalitions (HCCs) throughout the state with one identified Pediatric Healthcare Coalition. Each HCC has one assigned Regional Coordinating Hospital (RCH). The HCCs work with their respective RCH to develop disaster preparedness plans and exercises; however, not all the RCHs are trauma centers. The HCCs conduct multiple disaster preparedness exercises each year. Healthcare coalition partners work together to plan and exercise mass casualty scenarios based on their hazard vulnerability analysis, which varies between regions. The exercises, whether tabletop or full-scale, involve the local health department, EMA, EMS, and military if available.

Of note, the HCC regions in Georgia do not overlap consistently with EMS regions in the state. While there were some examples of the engagement of the Regional Trauma Advisory Committees in disaster planning, these examples were not consistent. Likewise, while there were some instances of trauma program leadership engaged in HCC exercise planning and execution, these were not consistent statewide and there were other examples of difficulties with intentional engagement of the trauma team by the HCCs.

A review of an After-Action Report from a full-scale mass casualty exercise revealed some capacity for the trauma system to surge in the event of a mass casualty incident (MCI). Hospitals within HCCs have developed mechanisms to decompress their census to prepare for an influx of MCI patients and distribute injured patients across hospitals, both designated trauma centers and non-designated centers, in the HCC Region. No patients from the example exercise were distributed to hospitals outside the HCC region, even though higher-level trauma centers and additional trauma care capacity were available in adjacent regions. Mobile and semi-permanent hospitals, along with MCI buses can be mobilized to further increase capacity as needed (as utilized during the COVID pandemic). Additionally, National Guard assets can be utilized in times of extreme need.

While there is no formal network of Regional Medical Operations Centers in Georgia, the Georgia Coordinating Center (GCC), based in the metro Atlanta area, does have the infrastructure to monitor individual hospital asset availability and coordinate movements of patients to appropriate facilities based on resource need. There was one example of a full-scale disaster exercise where the GCC was centrally involved in patient distribution to appropriate facilities, and the assessment was that it functioned quite well. While the GCC does have the ability to provide services such as this statewide, it does not appear it has been utilized to coordinate patient movement for disaster exercises in other HCC regions across the state.

Incident command and communications for disasters are handled on a local level. Regular MCI communications exercises are performed to test and evaluate these systems. Statewide incident command can be provided by the GEMA State Operations Center (SOC) when an incident is a threat to a large portion of the state.

Additional disaster training by EMS agencies and hospitals outside of HCC disaster exercises is left to the individual agencies and does not appear to be uniformly coordinated across the state. However, there were some individual EMS agencies that verbalized examples of disaster training efforts and resource acquisition and contingency planning. In-hospital disaster management education involving trauma leadership did not appear to be a priority or encouraged across the system at this time.

Emergency planning and response was cited as a recognized strength within the Department of Public Health (DPH) Office of Emergency Medical Services and Trauma (OEMST). It is clear this is a high priority with resources allocated to this role. There is strong and engaged leadership, along with collaboration between the HCCs, OEMST, and EMS agencies in the state. While a full network of RMOCs is not present across the state, the GCC does have a mechanism to assess participating hospital resource availability and make decisions regarding appropriate routing of patients. There does seem to be funding distributed for disaster preparedness and HCCs, as well as the GCC. In addition, there are military assets that can be activated by the Governor to supplement disaster responses when needed.

While the HCCs serve a vital role for disaster preparedness and training, there appears to be sole dependence by the trauma system on HCCs for disaster response planning and training. A trauma system disaster plan should be discussed at the RTAC level in each EMS region and included in the state trauma system plan. RTACs and trauma leadership at individual hospitals should intentionally seek integration into HCC exercise planning and participate at a high level in the disaster training exercises. The HCCs should ensure that all RCHs (where possible) are trauma centers, and that the trauma program leadership is involved in disaster planning. Also, attempts should be made to align HCCs and EMS regions where possible. At present, there does not appear to be formalized coordination of trauma specific aspects of patient care and routing between the HCCs and the RTACs (or RCHs). While it was stated by HCC leadership that trauma centers were involved in disaster management and planning activities, this engagement did not appear to be uniform across all HCCs, and it was unclear what specific role trauma leadership had in developing these plans. Attempts should be made to align HCCs and EMS regions where possible.

A network of RMOCs should be developed across the state to assist with patient surges that occur during an MCI. Alternatively, expanding the role of the established GCC in disaster management and including the GCC in all disaster management plans that address MCIs should be considered. The HCC After-Action Report demonstrated that patient allocation in the MCIs was siloed and focused only on hospitals within the HCC region. Trauma leadership should be engaged to devise plans for patient movement to appropriate hospitals based on the severity of injury, even if that requires moving patients outside the HCC region. Alternatively, engagement of the GCC as a statewide disaster management resource should be considered. The GCC has the capacity to expand to a statewide resource and consideration should be given to utilize it for patient movement following disasters in all regions of the state. A detailed assessment of military assets available to deploy during disasters should be made available and updated on a regular basis.

A disaster management course should be provided in each trauma center participating in the trauma system. The trauma system should provide funding for such courses to improve the disaster readiness posture of the trauma system.

The State of Georgia has considerable expertise and resources related to disaster preparedness and response. However, it is unclear whether all potential resources, such as experts in trauma care, have been consistently included in the disaster preparedness planning processes.

Recommendations

11.1. **Develop, at the state level, a multidisciplinary disaster planning group and integrate capability of the RMOC into all regional plans.**
- **Include representatives from GEMA, DPH, HCCs, RTAC leadership, trauma experts (to include trauma leadership at RCHs), EMS stakeholders, military, and others with identified expertise and resources in the management of multiple trauma events.**

11.2. Conduct mass casualty planning and exercises that focus on trauma center capabilities.

11.3. Further develop Regional Medical Operation Center (RMOC) capabilities, expanding on existing infrastructure with the ability to continuously monitor regional healthcare capacity and route patients to an appropriate level of care based on injuries and specific needs.

11.4. Ensure trauma centers, particularly those identified as Regional Coordinating Hospitals (RCHs), conduct formal disaster management training in their facilities.

Essential Trauma System Element #12: Military Integration

The trauma system should actively support integration and cooperation with military personnel, medical treatment facilities, and transport capabilities. This should include patient care, education, data collection, performance improvement, research, training, disaster response, and clinical readiness.

Purpose and Rationale

Integration of military trauma and emergency care resources into the local, regional, and national trauma system is an essential component of a trauma system plan to optimize patient outcomes and support the National Security Strategy. Through military-civilian collaboration at the local, regional, and national levels, a trauma system plan should work towards achieving zero preventable death and disability from injury both for our citizens at home and for our service members who are injured in defense of the nation.

When military and federal medical resources exist within the geographic area of the trauma system, public policy should authorize the lead agency to include military representation. A regional military trauma representative should be a member of the multidisciplinary advisory group. The military trauma resources should be fully integrated into the Department of Defense (DoD) Joint Trauma System just as the civilian regional trauma system should be linked to the national strategic trauma and emergency care system leadership. Military treatment facilities capable of achieving trauma center verification and designation and geographically located to support population need, should be supported to fully integrate and be operationalized within the state, regional and the DoD Joint trauma systems.

Military-civilian collaboration should include both individual and trauma team clinical readiness programs. There should be provisions for credentialing and privileging of medical personnel between military and civilian centers to optimize the education and training benefit for both civilian and military personnel. Standing agreements that enable military trauma teams to provide patient care in civilian trauma centers within regional trauma systems should be established and maintained to ensure clinical readiness. Level I and II trauma centers should engage in military-civilian partnerships for ongoing readiness training of military trauma teams.

A regional trauma system that functions daily is foundational for a successful response to crisis. The regional trauma system should be able to provide an appropriately scaled response to any disaster or mass casualty scenario. In the situation of a mass casualty scenario that overwhelms local and regional resources, the fully integrated military and civilian trauma and emergency care system can be efficiently and effectively mobilized. Integrated military-civilian trauma system resources should be leveraged to care for military casualties that overflow the capacity of regional military treatment facilities. There should be a comprehensive plan with annual drills to leverage the full spectrum of military, federal (Veterans Affairs facilities), and non-federal partners (via the National Disaster Management System).

Achieving the goals of an integrated national trauma system requires better integration between civilian and military trauma system elements, which should be supported with funding. The lead agency should have situational awareness of civilian-military trauma partnership agreements within its jurisdiction.

Current Status

There is currently one military treatment facility, Winn Army Community Hospital, designated as a trauma center (Level IV). Two other military treatment facilities are currently open in Georgia,

including Martin Army Community Hospital at Fort Benning (Columbus) and Eisenhower Army Medical Center at Fort Gordon (Augusta). Martin Army Community Hospital is currently in the process of acquiring trauma center designation, while Eisenhower Army Medical Center has decided not to pursue designation at this time. There is clear and demonstrated interest from Winn Army Community Hospital to integrate, at a high level, within the Georgia Trauma System and provide trauma services to both military and civilian trauma victims within their capabilities and available resources. They also appear to have a well-defined interest in providing support for disaster preparedness and planning activities and could potentially offer aeromedical transport utilizing military assets. These activities appear to align and support their need for ongoing military medical readiness.

As of September 19, 2022, Grady Memorial Hospital is one of eight trauma care centers to establish a U.S. Army Military-Civilian Trauma Team Training (AMCT3) site. This program allows medical military personnel to maintain trauma skills by working alongside civilian counterparts at a high-volume, high-acuity Level I trauma center.

The State of Georgia has demonstrated emergency response relationships between the emergency management activity of the GEMA and the military. Military installations are members of their local HCCs and are active members for planning and exercising, though it is unclear to what extent the military treatment facilities are integrated and engaged with these plans. At the state level, the Georgia DoD serves as Emergency Support Function (ESF) 16 to the GEOP. The Georgia DoD is activated during a declared emergency and works with GEMA and the other ESFs at the SOC. The plan does not reflect military integration and resources statewide; however, regionally there is stated collaboration between the military installation and the local/regional response plan coordinated through the HCCs.

During COVID, the National Guard was activated and served in a variety of roles across Georgia such as testing facilities, vaccination sites, disinfecting long term care facilities, assisting with traffic and security at hospitals, and staffing of the Georgia interagency warehouse.

The trauma system plan does not currently address a reciprocal partnership with the military for the contingency of a civilian or military mass casualty events, nor is there any mechanism for a military-civilian credentialing reciprocity for times of crisis.

Recommendations

12.1. Facilitate integration of military treatment facilities into the trauma system plan. Engage local/regional military resources in state level and regional trauma system development planning processes.

12.2. Assess and integrate statewide military capabilities and resources into the Georgia Emergency Operations Plan (GEOP).

12.3. Develop a formal reciprocal partnership with the military for the contingency of a civilian or military mass casualty event.

12.4. Establish a formal military-civilian credentialing reciprocity process that can be utilized during times of need.

Rural Focus

This portion of the document is a supplement focusing specifically on care of the injured patient in rural areas of Georgia. Some of the topics and conclusions have also been emphasized in the prior sections.

Trauma System Infrastructure

Current Status

OEMST has direct oversight for the trauma designation process while funding to facilities is controlled by the GTC. OEMST has defined the trauma center levels of care, including Level I-IV designated centers; all other facilities are “non-trauma” hospitals. The OEMST does not currently designate trauma facilities based on need. The GTC has discretion to fund trauma facilities as deemed necessary.

Starting June 30, 2025, any Level III center must have verification from the ACS for access to any available GTC funding. The anticipation is that all current Level III centers will obtain ACS verification with subsequent designation by the OEMST to maintain access to funds. There is apprehension by some Level III centers undergoing the ACS consultative and verification process. Despite the OEMST using similar criteria for Level III designation, the standards for ACS verification may not be achievable. There have been concerns raised regarding the OEMST’s adherence and application of standards during the designation process of Level III centers. Level IV centers are designated only by the OEMST, as there is currently no ACS verification process for Level IV centers. The designation process for the Level IV centers uses ACS recommendations from the Optimal Care of the Injured Patient (2014). The designation process for this level has been inconsistent; demonstrated by noncompliance with redesignation timing and standards. The current process for designation by OEMST utilizes only interdepartmental personnel and in-state providers. The OEMST requires a minimum one year of data entry into the Georgia State Trauma Registry, which is seen by many as prohibitive from a cost and staffing standpoint. A facility desiring to become a verified Level III center also has an extended period with no access to funding despite maintaining all required criteria. The process for an undesignated hospital to become a designated trauma center is felt to be neither desirable nor attainable by many facilities in Georgia. A formal structure to onboard non-designated facilities regarding programming, funding, and mentorship does not exist.

Funding of the rural trauma centers is through the GTC. Level III and Level IV centers are compensated differently, and there is no opportunity for uncompensated care funding for either. The GTC annual report (2022) has five Level III and five Level IV centers receiving funds from the GTC. Historically, Level III centers received $20k for readiness, potentially $30k for performance-based measures, and approximately $11k for registry support. The Level IV centers received $8.1k for readiness, potentially $1.5k for performance-based measures, and approximately $2k for registry support. As part of the amended budget, Level IIIs and IVs received an additional $69,000 and $13,000 in readiness respectively with an additional registry funding match of $6,000 to $9,000 to support the web-based registry. In addition, the GTC supports the Level III costs of participation in the ACS Trauma Quality Improvement Program participation annually at $27,000 per Level III center. Many rural facilities do not bill for trauma activations due to lack of understanding and administrative support. A readiness cost analysis was performed by the GTC in 2021 and reported an approximate cost of $1.7mil for Level III

centers and $81k for Level IV centers. There are minimal to no funds provided for becoming a trauma center, which is extremely prohibitive due to OEMST requirements for embarking on the designation process. As demonstrated by the readiness report, there is a significant lack of funding for the rural trauma facilities, and consideration should be given to altering the distribution of funds throughout the trauma system by the GTC.

EMS has received additional funding from the GTC for education and medical equipment through grants. Georgia has a high percentage of compensated EMS personnel, unlike most underserved areas across the United States. GTC provided over $1.7mil in EMS equipment grants in 2022. Despite this funding support by the GTC, EMS is underfunded. A substantially high population of Georgia falls below the federal poverty threshold and is uninsured when compared to the United States. This presents an increased burden for sustained funding and insurance reimbursement.

Rural centers, like all higher-level trauma centers in Georgia, operate within the RTAC structure, which for some has been burdensome from both a resource and time commitment perspective. Although some of the RTACs have robust and energetic participation, it is not consistent. There is not a well-defined trauma multidisciplinary advisory group, and there is no OEMST Trauma Medical Director. This lack of trauma leadership and structure has left the rural centers siloed and under-supported throughout Georgia and has hindered trauma system development. The current structure has not facilitated the ability to address rural specific needs.

Providers in the Level IV centers have inconsistent training and capabilities to care for the severely injured patient. Workforce shortages are a significant factor in the rural areas, further contributing to the disparity between rural and urban areas. This is seen across the spectrum of rural care including providers, nursing, and EMS. Rigorous efforts must be made to bolster the rural areas with a sustainable workforce. Funding and creative thought processes are necessary to further this effort. This has been exemplified across some areas of the state by early recruitment and training programs for EMS during high school.

Mentorship for trauma managers in trauma center development and sustainability is highly variable. Some Level I/II centers have taken a leadership role, but overall, mentorship is inconsistent and seems to be based on hospital affiliation. Although the GTC has recently created a committee for the participating Level III and Level IV centers, a structured partnership of all rural centers throughout the state does not exist.

There is an evident lack of a functional trauma system plan, specifically integrating the rural environment. The healthcare environment has limited resources and staffing, being even more profound in rural communities. The need for trauma care in the rural areas has exceeded the current resources available. Despite passionate EMS personnel, there are extremely limited resources for interfacility transport and injury scene response. A deficient trauma structure exacerbates this challenging situation. A trauma system plan must address the significant healthcare disparities within the rural communities. This includes adequate funding of the rural component of the trauma system and the care constraints influenced by social determinants of health.

Recommendations

1. **Perform comprehensive resource/needs assessments addressing the following:**

- **Funding for the rural trauma system emphasizing the rural aspect of EMS and trauma hospitals.**
- **Evaluation of rural trauma capacity to identify gaps including EMS, trauma hospitals, and transfer capabilities.**
- **Recruitment and retention primarily focusing on rural providers, nursing, and EMS.**

2. **Ensure involvement and participation of the rural trauma hospitals and EMS in an inclusive Georgia statewide trauma system plan.**

3. Develop standards regarding qualifications and educational requirements for providers caring for injured patients in the rural environment.

4. Develop a mentorship program for the development and maturation of a rural trauma facility, focusing on the trauma program manager and process improvement.

5. Engage the statewide RTAC system, standardizing rural involvement, and developing an infrastructure to address the local and regional needs of the rural trauma system.

6. Engage stakeholders and lawmakers to improve funding for rural centers and maximize opportunities for revenue by clarifying rules and regulations of trauma activation billing in the State of Georgia.

7. Re-evaluate distribution of existing and future funds to better support rural trauma centers.

Trauma System Components and Integration

Current Status

Optimal management of the trauma patient requires a clear, simple, and organized approach. Lack of standardized trauma education for rural emergency providers contributes to delays in diagnosis, critical interventions, and timely transport to the appropriate level of care. Implementation of standardized trauma education can improve outcomes in traumatically injured patients. Level I and II verified trauma centers in the region provide educational opportunities in the form of Advanced Trauma Life Support (ATLS) and the Rural Trauma Team Development Course (RTTDC). There has been a statewide effort to educate providers emphasizing the MARCH-PAWS mnemonic and the Stop The Bleed course as resources for initial evaluation and management of the trauma patient.

Innovative solutions to staffing shortages have been developed in rural areas. Initial education of EMS personnel through high school programs has shown success with recruitment into rural EMS agencies. To increase trauma training within their department, one hospital has begun an internal training program specifically addressing competency in trauma care for nurses as well as providers. A robust Georgia community paramedicine program has demonstrated anecdotal success with conservation of hospital resources.

Currently, the strained EMS system has led to delayed scene response, contributing to preventable morbidity and mortality. Transport difficulty surrounding the critically injured patient

is further exacerbated by inconsistent transport and destination practices. The lack of clear guidelines for transport from scene to destination contributes to an inefficient use of resources within the trauma system.

As it stands, there is no incentive for rural facilities to care for trauma patients. Without an established, consistent, and appropriate interfacility transfer system, rural facilities are burdened with patients that would be better served at a higher level of care. In contrast to this, the EMS system is incentivized to deliver patients to the closest facility without regard to designation status or facility capability. Contributing factors for these decisions include prolonged transfer times to a designated trauma center, longer “wall times”, and concern that patient transfers leave a gap in EMS coverage for their community. Accelerated transfer agreements in combination with “rescue stops” at rural facilities have the potential to stabilize critically injured patients without significantly delaying transfer to definitive care.

The significant over-triage and transfer of the less severely injured patient to a higher-level trauma center strains resources and incurs additional health care costs to the patient and system. Unnecessary transfers to high-level trauma centers for less severely injured patients can be avoided by a greater capability to evaluate injured patients and deliver appropriate trauma care. Subsequent return to a patient’s home region from distant trauma centers involves personal cost and additional hardship. Timely and appropriate repatriation increases capacity at higher level trauma centers and allows traumatically injured patients to return to their home community for rehabilitative care.

Anecdotal evidence provided during the stakeholder's meetings suggested ongoing diversion of injured patients from rural emergency departments. The process of diversion is poorly defined and implemented. Many reasons were cited for the diversion of the severely injured patient including non-trauma designation, lack of resources, and capability.

Rural Georgia emergency departments have not utilized telemedicine as an adjunct to assist in the care of the severely injured patient. Telemedicine can expand the capabilities of rural facilities and conserves resources at receiving trauma centers. Participation in telemedicine programs can offer other vast resources such as transfer assistance, pharmacy resources, surgical subspecialties, and inpatient care assistance. Utilizing telemedicine during inpatient management provides the opportunity to co-manage admitted trauma patients in conjunction with trauma specialists from a remote center. Technology can reduce patient transfers, expand the capacity of a trauma system, keep both the patient and family in the community, and generate financial revenue for the local facilities. Georgia is currently participating in a pilot project using telemedicine resources within EMS services to allow medical control to be directly involved with real-time patient care.

Air medical resources play a vital role in the care continuum of injured patients throughout rural Georgia. Rapid transport capability is only one facet of the medical resources they provide as air medical crews are a force multiplier in areas with limited resources. In addition to providing skilled medical care, they also bring the ability to deliver blood products and critical procedural skills directly to the rural environment.

Recommendations

1. **Standardize trauma care in rural Georgia through educational programs.**

2. **Improve the capability to manage injured patients in the rural environment by increasing the complement of emergency medicine providers and improving competency of existing providers in rural emergency departments.**

3. **Improve scene response times by bolstering existing mutual aid agreements and addressing staffing shortages.**

4. **Develop a process for rescue stops and accelerated transfer in rural areas.**

5. Pursue increased telemedicine capability within the rural environment, such as emergency departments and EMS.

6. Enact EMS guidelines based on best practices (2021 National Guideline for the Field Triage of Injured Patients) to ensure traumatically injured patients are delivered to the appropriate level of care.

7. Develop an interfacility transfer system sensitive to the challenges of rural care.

8. Maintain accountability in the designation and redesignation of Level IV trauma centers.

9. Repatriate patients to their local facility as appropriate.

10. Continue innovative programs on a local level to fulfill staffing shortages and provide opportunities for trauma education.

11. Evaluate the utilization of air medical resources for transport and assistance for emergency care in the rural environment.

Data and Performance Improvement

Current Status

All designated trauma facilities must participate in the Georgia Trauma Patient Registry (GTPR). The registry recently changed vendors and is now utilizing ImageTrend, with the anticipation of data linkage with other platforms, including the EMS registry.

Level III centers must also participate in the ACS COT TQIP, and all trauma centers receiving funding from GTC are required to participate in the Georgia Quality Improvement Program (GQIP). Non-designated trauma centers do not have to participate in any trauma data registry. The data entered by rural facilities is exceptionally scarce in comparison to Level I/II centers. Level IV data is usually collected and entered by the TPM. Many Level III centers have dedicated registrars yet continue to have low volumes of data submitted. The infrequency or low volume of entries at rural facilities does not allow the TPM to develop proficiency in data entry, injury coding, and ISS scoring.

There is no formal process for onboarding new TPMs or registrars throughout Georgia. The GTC and OEMST have offered support if requested and will provide assistance if their resources allow. Data is entered into the registry once; however, many rural facilities must

upload data into two or three different registries, which can be time consuming, complicated, and lead to data inconsistencies. Most facilities, whether designated or not, agree that maintaining data registry requirements is a significant barrier to designation.

Collection and utilization of data in the rural area is challenging for multiple reasons, with the emphasis on lack of funding and staffing. The utilization of data is important for the development of process improvement measures. The rural area has less expertise in caring for special populations such as children, the elderly, and burn patients. This experience deficit can result in substantial challenges in data accumulation and evaluation for these special populations. Support and local expertise must be shared with the rural facilities for outcome improvement in the care of special populations.

The ability to perform appropriate performance improvement (PI) demonstrates the maturity of a trauma facility or system. Level III and IV trauma centers feel the burden of PI due to lack of funding, staffing resources, and a deficit in understanding the process. Minimal systemwide education surrounding the aspects of PI is provided in the rural environment. The GTC, through the TPM committee, however, is providing process improvement, hospital-based education. The lack of an appropriate state PI process is a detriment to patient care and outcomes. While Georgia does not have a robust statewide PI process, there is a collection of facility specific data through both the GQIP and ACS COT TQIP collaborative. This information demonstrates the performance of individual hospitals but does not evaluate how a system functions regarding processes. There is a significant lack of inclusion regarding the Level IV facilities in existing process improvement measures. A multidisciplinary advisory group under the guidance of a Trauma Medical Director should direct statewide process improvement. The process should be inclusive, funded appropriately, evidence-based, and evaluated regularly. Appropriations must be available for training and mentorship for TPMs to acquire, develop, and maintain the needed skills for PI.

Recommendations

1. **Provide education and collaboration opportunities for rural facilities to achieve proficiency regarding data entry and validity.**

2. **Provide rural trauma program managers process improvement training along with mentorship and support from other facilities.**

3. Develop a RTAC/regional process improvement collaborative for rural hospitals to facilitate communication along with development and growth.

4. Develop a program to assist rural facilities in the management of data acquisition, entry, and extraction to and from Georgia State Trauma Registry.

5. Explore methods for data entry, such as mentorship, hands on training, collaborative initiatives, and automation.

Disaster Preparedness and Military Integration

Current Status

Stakeholders expressed active collaboration and strong relationships between rural healthcare facilities and their Local Emergency Planning Committees (LEPCs).

Georgia has 14 Health Care Coalitions (HCC), each of which has a Regional Coordinating Hospital (RCH) that serves in conjunction with District Public Health personnel to lead each region as part of a nationwide preparedness effort. Each HCC is active in health hazard risk assessment and disaster exercise implementation.

There is no interaction and integration between rural trauma providers and emergency preparedness partners at the local level. While there has been some collaboration with military medical centers there was an ardent desire expressed to further integrate military medical resources into the rural trauma environment.

Recommendations

1. Foster collaboration between rural healthcare facilities and local emergency preparedness organizations.

2. Assess and integrate statewide military capabilities and resources into the rural trauma environment.

Appendix A: Acronyms

ACS	American College of Surgeons
AEMT	Advanced Emergency Medical Technician
ALS	Advanced Life Support
AMCT3	Army Military-Civilian Trauma Team Training
ATLS	Advanced Trauma Life Support
AVLS	Automatic Vehicle Location System
BLS	Basic Life Support
CAN	Child Abuse and Neglect
CARF	Commission on Accreditation of Rehabilitation Facilities
CMS	Centers for Medicare and Medicaid Services
CODES	Crash Outcome Data Evaluation System
COT	Committee on Trauma
DoD	Department of Defense
DPH	Department of Public Health
ED	Emergency Department
EMA	Emergency Management Agency
EMR	Emergency Medical Responder
EMS	Emergency Medical Services
EMSAC	Emergency Medical Services Advisory Council
EMSC	Emergency Medical Services for Children
EMSDAC	Emergency Medical Services Medical Director Council
EMT	Emergency Medical Technician
ESF	Emergency Support Function
GCC	Georgia Coordinating Center
GCTE	Georgia Committee for Trauma Excellence
GEMA	Georgia Emergency Management and Homeland Security Agency
GEMSIS	Georgia Emergency Medical Services Information System
GEOP	Georgia Emergency Operations Plan
GIPC	Georgia Injury Prevention Council
GQIP	Georgia Quality Improvement Program
GTC	Georgia Trauma Commission
GTPR	Georgia Trauma Patient Registry
GTSF	Georgia Traffic Safety Facts
GVDRS	Georgia Violent Death Reporting System
HCC	Healthcare Coalition
ICISS	International Classification of Injury Severity Score

ISS	Injury Severity Score
MADD	Mothers Against Drunk Driving
MARCH PAWS	Massive Hemorrhage, Airway, Respirations, Circulation, Head Injury/Hypothermia, Pain Control, Antibiotics, Wounds, Splinting
MCI	Mass Casualty Incident
MVC	Motor Vehicle Crash
NBATS	Needs Based Assessment of Trauma Systems
NEMSIS	National Emergency Medical Services Information System
NHTSA	National Highway Traffic Safety Administration
NTDS	National Trauma Data Standard
OEMST	Office of Emergency Medical Services and Trauma
OTCPE	On-Going Trauma Center Performance Improvement
PBP	Performance-Based Payment
PCR	Patient Care Report
PI	Performance Improvement
PRQ	Pre-Review Questionnaire
PSO	Patient Safety Organization
PTSF	Pennsylvania Trauma System Foundation
QI	Quality Improvement
RCH	Regional Coordinating Hospital
RMOC	Regional Medical Operations Center
RTAC	Regional Trauma Advisory Committee
RTTDC	Rural Trauma Team Development Courses
SADD	Students Against Destructive Decisions
SCI	Spinal Cord Injury
SOC	State Operations Center
STB	Stop The Bleed
TBI	Traumatic Brain Injury
THIRA	Threat and Hazard Identification and Risk Assessment
TMD	Trauma Medical Director
TPM	Trauma Program Manager
TSC	Trauma System Consultation
VAP	Ventilator-Associated Pneumonia

Appendix B: Methodology

The Georgia Trauma Commission requested this consultative review of the Georgia State Trauma System, which was conducted under the auspices of the Trauma Systems Consultation (TSC) Program of the American College of Surgeons (ACS) Committee on Trauma (COT). The multidisciplinary TSC Review Team consisted of three ACS staff and seven nationally recognized trauma experts, including: four trauma surgeons, an emergency medicine physician, a state emergency medical services medical director, and a trauma program manager. Biographical information about the 10 ACS TSC Review Team Members is provided in Appendix C.

The primary objective of the ACS TSC for the Georgia Trauma System was to guide and promote a sustainable effort in the development of an inclusive and integrated system of care in the state, with a special focus on the rural environment. The format of this TSC Report correlates with the Essential Trauma System Elements outlined in the ACS *Trauma Systems Consultation Guide: Essential Elements, Framework, and Assessment for State and Regional Trauma Systems*. Prior to the Site Visit, the TSC Review Team studied the ACS Pre-Review Questionnaire (PRQ) and additional supporting documents submitted by the Georgia Trauma System leadership. Other information publicly available on government and official websites was also assessed.

The ACS TSC Review Team convened for a site visit from January 9th through 13th. The five-day site visit consisted of three stakeholder plenary sessions during which the ACS TSC Review Team engaged with a broad range of representatives from the Georgia Trauma System, with the opportunity for more informal discussions to take place in between sessions. The first stakeholder session included all state stakeholders, and the other two meetings were half-day sessions with rural stakeholders in southern and northern Georgia. The ACS TSC Review Team sequestered in private team meetings for more detailed review and discussion of the trauma system data, to establish consensus on essential elements regarding the trauma system, develop recommendations for system improvement, and to prepare the TSC Report.

The conceptual framework of the *Trauma Systems Consultation Guide* is the Essential Trauma System Elements. Since the 1980s, experts in the field of trauma system development have sought to define the necessary and essential components of a working trauma system. The functional elements of highly effective trauma systems were outlined in two documents published by HRSA, the Model Trauma Care System Plan in 1992 and Model Trauma Systems Planning and Evaluation in 2006. Using these sources as well as data gained from over 40 Trauma System Consultations performed by the Trauma Systems Evaluation and Planning Committee of the ACS COT, a draft set of essential elements was developed in 2018 by a multidisciplinary workgroup led by the ACS COT. These essential trauma system elements were subsequently refined through input from stakeholder organizations from across the spectrum of injury care.

The Trauma System Consultation Report for the Georgia Trauma System presents the same Purpose and Rationale as those within the *Trauma Systems Consultation Guide* for each of the Essential Trauma System Elements.

Appendix C: ACS TSC Review Team Biographies

Brian J. Eastridge, MD FACS
Role: Trauma Surgeon
(Team Lead)

Dr. Brian Eastridge received his BS in biochemistry from Virginia Tech in 1985 and his MD from the University of Maryland School of Medicine in 1989. He entered the US Army Reserve as a second lieutenant Medical Service Corps officer in 1988. Dr. Eastridge did his residency in general surgery at the University of Maryland Medical System and then pursued fellowship training in surgical critical care at the University of Texas Southwestern Medical Center in Dallas, TX. During his tenure on the academic faculty at UTSW, Dr. Eastridge was deployed three times in support of combat operations Operation Enduring Freedom and Operation Iraqi Freedom as a U.S Army Reserve surgeon in 2002, 2003, and 2004. During his deployment in 2004, he was appointed as the first Joint Theater Trauma System Director.
Dr. Eastridge matriculated to active duty U.S Army in 2005 and served as Trauma Medical Director for the Brooke Army Medical Center, Surgical Critical Care Program Director for SAUSHEC, Director of the Joint Trauma System (U.S. Army Institute of Surgical Research of the U.S. Army's Medical Research and Material Command (MRMC), and Trauma Consultant to the US Army Surgeon General. During his active duty service, he was deployed two more times to combat in Southwest Asia during which time he lead the development and implementation of the military trauma system.

During his career, Dr. Eastridge has published extensively in the peer reviewed literature and edited three books focused upon improving the military trauma system and improving combat casualty care outcomes for our Wounded Warriors. Dr. Eastridge left active service and returned to the active US Army Reserves in late 2012 and is currently the DCCS of the 228th Combat Support Hospital. His military awards and decorations include the Combat Medical Badge, Combat Action Badge, Legion of Merit, Bronze Star Medal, Defense Meritorious Service Medal, and the Joint Service Commendation Medal. He is a member of Order of Military Medical Merit. For his military service, he has been awarded the American Association for the Surgery of Trauma Honorary Medal for Combat Surgical Care in 2004 and the US Army Medical Research and Materiel Command Combat Casualty Care Program Award for Excellence in 2011.

Currently, he is Professor of Surgery at the University of Texas Health Science Center and was appointed as the Trauma Medical Director of the University Health System in San Antonio, TX. He holds the Jocelyn and Joe Straus Endowed Chair in Trauma Research. His current research interests are focused on trauma system development, including development of the regional trauma system performance improvement initiatives, predictive modeling of injury outcomes, and improved pre-hospital resuscitation strategies for casualties. Dr. Eastridge also serves as an active member on the American College of Surgeons Committee on Trauma, and is the current Chair of the Trauma Systems Evaluation and Planning Committee, and the Trauma Systems Pillar.

Kristan Staudenmayer, MD, MS, FACS

Role: Trauma Surgeon

Dr. Kristan Staudenmayer received her medical degree at the University of Texas at Southwestern Medical School in 1999 and completed her residency in General Surgery at Parkland Hospital in 2006. During her post-graduate training, she conducted NIH T32-funded research at Harborview Hospital evaluating the effects of innate immunity on trauma. She obtained further training in Trauma and Surgical Critical at San Francisco General Hospital, completing her training in 2008. She was subsequently double boarded in General Surgery and Surgical Critical Care. Dr. Staudenmayer joined Stanford in 2008. She has developed a robust research program and active clinical practice. Her clinical and research interests have contributed to Stanford's multi-disciplinary approach to the management of surgical trauma. Dr. Staudenmayer's clinical focus is on trauma, emergency general surgery, and surgical critical care, and her research interests encompass trauma systems of care and vulnerable patient populations such as the elderly. Her efforts have been noteworthy and recognized in her 2013 K08 grant from the National Institute on Aging to study trauma in the elderly population. In 2016, Dr. Staudenmayer was honored by becoming the inaugural Gordon and Betty Moore Endowed Faculty Scholar, which helps to support her ongoing research efforts. Additional research accomplishments include being a co-principal investigator on an NIH CTSA award evaluating trauma systems. Dr. Staudenmayer has published over 50 articles and book chapters and has served on the editorial review board of several academic journals. She contributes nationally towards the academic mission by serving on committees for both the American Association for the Surgery of Trauma and the Eastern Association for the Surgery of Trauma. Dr. Staudenmayer was promoted to Associate Professor of Surgery in 2016, and continues her research, policy and advocacy work to improve the care and outcomes for patients with traumatic injuries and critical surgical illnesses.

William Oley, MD, FAAFP, FAWM, DiMM
Role: Emergency Physician

Billy Oley practices rural emergency medicine in Red Lodge, MT. His areas of interest include wilderness medicine and rural trauma systems. In addition to his practice he remains active in education and teaching including AWLS, CALS, and ATLS. Working in rural Montana allows him to be active with medical direction and education of EMS, SAR, Ski Patrol and other backcountry professionals. His outdoor interests include hunting, horse packing, climbing, and other pursuits in the backcountry of Montana and coastal Alaska.

Jorie Klein, MSN, MHA, BSN, RN
Role: Trauma Program Manager

Jorie Klein, MSN, MHA, BSN, RN, is the Director of the Texas Department of State Health Services EMS / Trauma Systems Section. In this capacity she is responsible for the oversight of 1,365 EMS agencies which include approximately 600 first responder organizations. In addition, she is responsible for the facility designation process which currently includes 303 trauma centers, 130 stroke facilities, as well as approximately 227 neonatal and 222 maternal centers. She has oversight of the contracts and funding distribution specific to her section. Prior to this role, Ms. Klein was the senior director of nursing for the Parkland trauma program, emergency

department, and UCEC. She is a past member of the Governor's EMS, Trauma Advisory Council's Trauma System Committee. In addition, Ms. Klein was on the Board of the North Central Texas Trauma Advisory Council. Ms. Klein is a past chair of the Board of the Texas EMS, Trauma and Acute Care Foundation, and a past president of the Society of Trauma Nurses (STN). She is a current member of the STN Trauma Outcomes Performance Improvement Committee. She is a past Board member for the Trauma Center Association of American. She serves as a past, appointed trauma program liaison member to the American College of Surgeons Committee on Trauma's Performance Improvement and Patient Safety Committee. In addition, she is an instructor for the Disaster Management Emergency Preparedness Course sponsored by the American College of Surgeons, and the TOPIC Course and the Rural TOPIC Course sponsored by the Society of Trauma Nurses. She is the course director for the Advancing Leadership in Trauma Centers Course sponsored by the American College of Surgeons.

Michael Person, MD, FACS
Role: Trauma Surgeon- Rural Specialty Reviewer

Dr. Michael Person received his medical degree at the University of South Dakota Sanford School of Medicine in 2004 and completed residency in general surgery at Iowa Methodist Medical Center in 2009. Dr. Person joined the Surgical Institute of South Dakota in 2009.

He is an Associate Professor of Surgery, along with Surgery Clerkship Director at the University of South Dakota, Sanford School of Medicine. Dr. Person has been a part of the American College of Surgeons Committee on Trauma (ACS COT) since 2013, currently is the State COT chair of South Dakota and the chair of the Rural Committee. While part of the ACS COT, he has been involved the Rural Trauma Team Development Course (RTTDC) including the course planning committee, part of the authoring team for the current edition and directing over 60 courses. He is also a member of the ACS Advisory Council for Rural Surgery. Dr. Person is the Chair of the Trauma and Acute Care Surgery at Avera McKennan Hospital and University Health Center. He has also worked alongside the South Dakota Department of Health on multiple projects, mostly focusing on rural trauma including South Dakota State Trauma Treatment Manual for rural facilities and the utilization of telehealth in the rural setting.

Curtis Sandy, MD, FACEP, FAEMS
Role: State EMS Medical Director

Curtis Sandy, MD FACEP FAEMS is an emergency medicine and EMS physician at Portneuf Medical Center in Pocatello. He has a degree in EMS Management from The George Washington University and is board-certified in Emergency Medicine and EMS. He has over 37 years of EMS experience as an EMT, paramedic, flight physician, tactical physician and EMS medical director. He is the medical director for several EMS agencies throughout Idaho including EMT and paramedic education programs, wildland fire, tactical medicine and air medical agencies. He is a founding member and current chair of the Idaho EMS Physician Commission, member of the Idaho Time Sensitive Emergencies Council and state EMS Advisory Council. He has special interest and expertise in operational EMS including tactical medicine and wildland fire medical operations. In his free time, he loves to travel with his wife.

Jeffrey Kerby, MD, PhD, FACS
Role: Observer- Trauma Surgeon

Jeffrey D. Kerby, MD, PhD, FACS is the Brigham Family Endowed Professor and Director of the Division of Trauma and Acute Care Surgery at the University of Alabama at Birmingham (UAB). Dr. Kerby received his medical degree from the University of Missouri at Kansas City in 1989. He completed his surgical residency at UAB in 1999, along with a postdoctoral research fellowship in 1996. Following residency, Dr. Kerby served in the United States Air Force as an active duty surgeon until 2003, deploying as a combat trauma surgeon in support of Operation Enduring Freedom in 2002. Dr. Kerby returned to UAB in 2003. An active researcher, Dr. Kerby served as the principal investigator for the Alabama Resuscitation Center of the Resuscitation Outcomes Consortium, an NIH funded multicenter research network focused on prehospital clinical trials in trauma and cardiac arrest, from 2005 through 2015. In addition, his division has a robust clinical trials and trauma outcomes effort established through the UAB Center for Injury Sciences and participates as an active investigative site for the Crash Injury Research and Engineering Network (CIREN). Dr. Kerby also current serves as the Trauma Consultant for the Office of Emergency Medical Services in the Alabama Department of Public Health. He has served on the American College of Surgeons Committee on Trauma (COT) since 2016 and was appointed Chair of the COT in 2022.

Melanie Neal, MS
Role: ACS Staff Team/ Specialty Reviewer

Ms. Melanie Neal has been with the American College of Surgeons for over 20 years, and is Assistant Director, Trauma Quality Programs. In this position, she provides strategic direction and high-level management for Verification, TQIP, Trauma Systems, Injury Prevention, and PIPS. Ms. Neal has a Master's degree in Social Science Research Methods.

Holly Michaels, MPH
Role: ACS Staff Team

Ms. Holly Michaels joined the American College of Surgeons (ACS) in January 2007 and has served in several key areas of the Trauma Quality Programs during her tenure at the ACS. As the Program Administrator for the Trauma Systems Consultation Program, Ms. Michaels managed over 30 state and regional system reviews, bringing together multidisciplinary teams of industry experts to assess, evaluate, and recommend strategic improvements for state and regional trauma systems. Following several years facilitating the growth and development of this program, she transitioned into a Program Manager role, leading the development of new programs including piloting the Level III Trauma Quality Improvement Program (TQIP) and expanding the TQIP Collaborative Program. In her current role, Ms. Michaels manages the Trauma Systems and Injury Prevention Programs.

Having received her Bachelor of Arts in English from the University of South Florida in 2001, Ms. Michaels began her career in public health at the non-profit organization, 2-1-1 Tampa Bay Cares, providing the Clearwater, FL community with access to critical resources, such as health

and social services. In August 2014, Ms. Michaels earned a Master of Public Health from the University of Illinois at Chicago.

Mackenzie Dafferner, MPH
Role: ACS Staff Team

Ms. Dafferner joined the American College of Surgeons (ACS) as the Program Manager of Trauma Systems Programs in September 2021. In this role, Ms. Dafferner provides administrative support to the COT subcommittees within the Trauma Systems Pillar and is the point of contact for the Trauma Systems Evaluation and Planning Committee. She also serves as the program manager for the Trauma Systems Consultation Program and other Trauma Systems and Quality initiatives.

Having received her Bachelor of Science in Health Sciences from Northeastern University, Ms. Dafferner began her career in healthcare as an EMT-B in Boston, MA. Prior to joining the ACS, Ms. Dafferner worked as a clinical research specialist at the Regenstrief Institute in Indianapolis, supporting clinical research interventions focused on longevity and Alzheimer's disease. In August 2021, Ms. Dafferner earned a Master of Public Health from Loyola University Chicago.

Appendix D: Consultation Participant List

First name	Last name	Company/Affiliation	Title
Jeffrey	Adams	Habersham County Emergency Services	Director
Jim	Adkins	Georgia Trauma Commission	Member
Alicia	Allen	Wellstar	Director of Nursing
Alex	Angelidis	Winn Army Community Hospital	Trauma Medical Director
Michelle	Archer	DPH/OEMST	Region 5 Director
Dennis	Ashley	Atrium Health Navicent	Chairman
Huey	Atkins	National EMS	VP
Elizabeth	Atkins	Georgia Trauma Commission	Executive Director
Amado Alejandro	Baez	Medical College of Georgia/ Augusta University	Professor and Vice Chairman
Susan	Baldridge	Wellstar Spalding Regional Hospital	Trauma Program manager
Misty	Barber	Jeff Davis Hospital	CNO
Julie	Barnes	AdventHealth Redmond	CMO
Elizabeth	Benjamin	Grady/Emory	Trauma medical director/professor of surgery
Mary	Bizilia	Piedmont Columbus Regional	TPM
Chad	Black	GEMSA	Chairman
John C	Bleacher	Georgia Trauma Commission	Member
Barry	Bloom	Jeff Davis Hospital	CEO
Tim	Boone	AVLS	Consultant
Zach	Botkin	Clayton County Fire & Emergency Services	Deputy Chief of EMS
Bill	Briggs	Wellstar North Fulton Hosptial	TPM
Kim	Brown	Hamilton Medical Center	Trauma Manager
Angela	Brown	Grady Health System	Director of the Marcus Trauma Center
Barlynda	Bryant	Northside Hospital Gwinnett	Trauma Registrar
Ashley	Bullington	Crisp Regional Hospital	TPM
Nadirah	Burgess	Northside Hospital Gwinnett	Trauma Program Manager
Michelle	Cain Williams	Baker Donelson	Partner
Kerry	Carter	Wellstar Paulding Hospital	TPM
Victoria	Carter	Wellstar Paulding Hospital	Trauma Registrar
Christen	Colwell	Upson Regional Medical Center	Director of Emergency Services
Keri	Conley	Georgia Hospital Association	General Counsel and EVP, Health Care Policy

Jay	Connelly	Piedmont Henry	Director trauma and stroke
Brad	Cothran	Piedmont Cartersville Medical Center	EMS Liaison/Outreach
Xavier	Crockett	GA DPH	State Health Protection Director
Arthur	Curran	Wellstar	TMD
Dana	Davis	Northside Hospital Gwinnett	Trauma Registrar
Lisa	Dawson	GA DPH	Injury Prevention Program Manager
Michael	Dodson	Grady EMS	Director of Operations
Brian	Dorriety	Georgia Trauma Commission	RTAC 7 Coordinator
Ronald	Drake	Emanuel Medical Center / Emanuel County EMS	EMS Director
Victor	Drawdy	Georgia Trauma Commission	Member
April	Dukes	Crisp Regional Hospital	CNO, VP PCS
Janann	Dunnavant	Crisp Regional Hospital	Registrar
James	Dunne	Georgia Trauma Commission	Member
Molly	Edmunds	JCS	Paramedic
David	Edwards	Crisp County EMS	EMS Director
Richard	Elliott	Clayton County Fire & Emergency Services	Deputy Chief, Chief Training Officer
Michele	Evans	Winn Army Community Hospital	ER Chief Nurse & TPM
Ashley	Faircloth	Augusta University	Trauma Program Manager PI
Brandi	Fitzgerald	Phoebe Putney Memorial Hospital	Trauma Program Manager
Jim	Fox	Erlanger Health System	Business Development Manager FP-C
Robin	Garza	Grady	VP trauma/burn programs
Jesse	Gibson	NGHS	Trauma Program Director
Brandin	Gillman-Clark	OEMST	Region 2 Training Coordinator
Chris	Gisness	Emergency Nurses Association	GA State Council President
Greg	Goedert	Atrium Health Floyd EMS	Training Officer
Mary Beth	Goodwin	John D. Archbold	Trauma PI Coordinator
Lynn	Grant	Fairview Park Hospital	Trauma Program Director
Sofia	Gratas	Georgia Public Broadcasting	Rural Health Reporter
Linda	Greene	NGHS	Trauma registry coordinator
Ashley	Gresham	Grady Health Systems	Vice President Emergency Services

Becca	Hallum	Georgia Hospital Association	Associate General Counsel and Compliance Officer
Nita	Ham	Georgia State Office of Rural Health	Senior Director
Katie	Hamilton	Georgia Trauma Commission	Finance Operations Officer
Rachel	Hand	Wellstar West Georgia Medical Center	Trauma Program Manager
Benjamin	Harbin	Atrium Health Floyd	Paramedic
Tracy	Harris	Northside Gwinnett Hospital	Trauma Registrar
Vincent	Harris	Georgia Office of EMS & Trauma	Region 04 EMS Director
Katie	Hasty	Atrium Health Floyd	Injury Prevention Coordinator
Elizabeth	Head	GA DPH	Deputy Director, Injury Prevention
Leah	Hoffacker	GA DPH	Public Health Emergency Preparedness Director
Christopher	Hogan	Doctors Hospital of Augusta	Associate Medical Director of Trauma and Critical Care
Cindy	Hoggard	AdventHealth Redmond	Director ER/Trauma
Sarah	Holcombe	Northside Hospital Gwinnett Trauma	RN, Trauma Clinician
Troy	Holder	Erlanger Life Force	Regional operations supervisor
Mark	Hollingsworth	DPH Office of EMS and Trauma	Region 10 Training Coordinator
Kyndra	Holm	AU Health	Pediatric Trauma Program Manager
Bounthavy	Homsombath	JMS burncenters	Medical Director
Colleen	Horne	Northside Gwinnett	Trauma Registrar
Kurt	Horst	Piedmont Athens Regional/National EMS/Region 10 EMS	Physician
Karen	Hust	Piedmont Walton Hospital	TPM
Richard	Jacob	Piedmont Walton Hospital	TMD
Reg	James	Amerimed	President
Tracy	Johns	Atrium Health Navicent Med Center	Trauma Program Manager
Laura	Johnson	Emory/Grady	Burn Medical Director
Michael	Johnson	DPH-OEMST	Director
Karen	Johnson	Wellstar Kennestone Regional Medical Center	Trauma Registrar II
Danielle	Johnson	Kennestone / RTAC 3	Outreach/IP Coordinator

Kelly	Joiner	Office of EMS and Trauma	Deputy Director of EMS
Justin	Keeton	Piedmont Henry Hospital	Trauma PI coordinator
Susannah	Kidwell	Children's Healthcare of Atlanta, Rehab Services	Director, Rehab Services
Brandie	Kilcrease	Upson Regional Medical Center	ACNO
Charles	Killebrew	OEMST	Regional Director
Crispin	Kingrey	OEMS	Training Coordinator
Zachary	Lancaster	AU Health AirCare	Program Director
Wendall	Lewis	OEMST	Regional Training Coordinator- R 1
Jason	Lewis	Oglethorpe County EMS	EMS Director
Jonathan	Lieupo	OEMST	Regional Training Coordinator, Region 8
Danlin	Luo	DPH	Epidemiologist
John	Mabry	Emanuel Medical Center	Educator
Brooke	Marsh	Emanuel Medical Center	TPM, ED Manager
Anita	Matherley	Georgia Trauma Commission	Region 8 RTAC
Christie	Mathis	Morgan Medical Center	TPM
Patrick	McDougal	State of Georgia	State EMS Medical Director
Regina	Medeiros	GTC	
Grace	Mills	Wellstar	Trauma Nurse Coordinator
Duane	Montgomery	Schley County EMS	Director
Anelia	Moore	OHSC	Assistant Director and Senior Policy Advisor
Renee	Morgan	Office of EMS and Trauma	Trauma Program Director
Heather	Morgan	Piedmont Athens Regional	Trauma Program Manager
Renee	Morgan	OEMST	Trauma Program Director
April	Moss	OEMST	Deputy Director, Systems of Care
Kelly	Nadeau	Georgia Department of Public Health	Director Healthcare Preparedness Program
Amy	Norton	AirLife Georgia	Regional Clinical Director
Lee	Oliver	Region 5, EMSAC, MAAS	VP Ops
Bud	Owens	EMSAC; Atrium Health	Immediate Past Chair; Executive Director EMS
Shane	Owens	Air Life Ga; Air Methods	Area Manager
Karrie	Page	Memorial Health Meadows Hospital	Trauma Coordinator
Farrah	Parker	Region 6/JMS Burn center	Region 6 RTAC Coordinator

Sarah	Parker	Grady Memorial Hospital	Trauma Program Director
Melissa	Parris	Atrium Health Floyd	Trauma Program Coordinator
Sonny	Patel	Mercer University School of Medicine	Medical Student
Gregory	Patterson	Archbold Trauma Center	TMD
Jackie	Payne	NGMC	Trauma Outreach & Injury Prevention Coordinator
Jordan	Pierson	OEMST	Region 1 Director
Gary	Pinard	OEMST	Regional Director
John	Pope	Piedmont Cartersville	Trauma Program Manager
Eshon	Poythress	Georgia Highway Safety Office	Strategic Planning Manager
Peki	Prince	DPH-EP-OEMS	EMS Liaison
Marie	Probst	OEMST	State Trauma Registrar
Pete	Quinones	Trauma Commission/Maas	Member/CEO
Faith	Rand	Atrium Health Navicent Medical Center	PI Coordinator
Alicia	Register	Crisp Regional	TMD
Bernard	Restrepo	OEMST	Training Coordinator
Richard	Rhodes	OEMS	Training Coordinator.
Rana	Roberts	Children's Healthcare of Atlanta	Director, Trauma, Transport, and Transfer Center
Scott	Roberts	Region 4 EMS	Assistant Chief
Joe	Robinson	Community Ambulance	Vice President-Emergency Medical Services
Kellie	Rowker	Children's Healthcare of Atlanta at Scottish Rite	RN. TPM
Christopher	Ruiz	Doctors Hospital of Augusta	VP of Trauma Services
John	Ryan	Augusta University	Emergency Manager
Gabriela	Saye	Georgia Trauma Commission	Executive Assistant
Damien	Scott	Emanuel Medical Center	CEO
Joe	Sharma	Emory	Medical Director, GQIP; Professor of Surgery
Crystal	Shelnutt	Region 10 RTAC	Coordinator
Stacey	Shipley	Grady Memorial Hospital	Trauma Registry Supervisor
Juanita	Simons	Atrium Health Navicent	EMS Communications Manager
Samantha	Sindelar	DPH	EMSC Program Manager

Kristal	Smith	AHNMC/R5 RTAC/GCTE IP Subcommittee	
Gina	Solomon	Georgia Trauma Commission	GQIP Director
Scott	Stephens	NW GA EMS Systems	Peds Chair
Rayma	Stephens	Northside Hospital Gwinnett	PI Coordinator
Nate	Sullivan	Cherokee County Fire & Emergency Services	EMS Chief
Jack	Sumner	Berrien County EMS	EMS Director
Nicole	Sundholm	Adventhealth Redmond	Trauma Program Manager
Lanier	Swafford	Office of EMS	Region 2 Director
Courtney	Terwilliger	Georgia Trauma Commission	Member
Robert	Tester	Erlanger / LIFE FORCe	Sr. Director
Gail	Thornton	Emanuel Medical Center	Trauma Registrar/Trauma Coordinator
Jan	Tidwell	Piedmont Cartersville	CNO
S. Rob	Todd	Grady Health System	Senior Vice President / Chief, Acute Care Surgery
Monica	Trotter	Advent Health Redmond	Trauma PI Coordinator
Dawn	Truett	Atrium Health Floyd Polk Medical Center	Trauma Program Manager/ Health Program Leader
Joel	Truss	Tanner Health System	Government Affairs Coordinator
Frances	Van Beek	Wellstar	AVP, Trauma & Neuro Services
Jamie	Van Ness	Wellstar Kennestone	Director of Trauma Services
Matthew	Vassy	Northeast Georgia Medical Center	Trauma Medical Director
Kelli	Vaughn	John D Archbold Memorial Hospital	Trauma program manager
Ford	Vox	Shepherd Center	Medical Director, DoC Program
Michelle	Wallace	Georgia Trauma Commission	Member
Cheryle	Ward	Georgia Trauma Foundation	Executive Director
Daniel	Warren	Ga Dept Of Public Health	Regional EMS Director - Region 8
Rafe	Waters	Air Evac Lifeteam	Sr Program Director
Amy	Watson	Effingham Health System	TPM
Joe	Webber	Augusta University	Director, Emergency Management
Lori	Wood	Grady Health System	Executive Director
Crystal	Wynn	Atrium Health floyd	Trauma PI

Marty	Wynn	Piedmont Walton Hospital	CFO