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The 2004 *U.S. Trauma Center Crisis* report described the failing economics of trauma systems in the U.S, and in 2006, the Institute of Medicine (IOM) went further in declaring that our nation's entire emergency care system is "at the breaking point."

The IOM also presented a vision of "regionalized, coordinated, and accountable trauma/emergency care systems" that optimize the value of scarce resources in both urban and rural environments to assure the best possible care for all those who need it.

Georgia's experience with trauma and emergency care provides a classic example of the crisis described by the IOM, and the state's initial response positions it to take advantage of the many opportunities the IOM identified.

**Healthcare Georgia Foundation**  
grantmaking for health



In 2007 the Healthcare Georgia Foundation awarded a grant to Bishop+Associates (B+A) to assess the economics of the Georgia Trauma System and to identify alternatives to stabilize and strengthen it for the decades ahead. Created in 1999 as an independent private foundation, the Foundation's mission is to advance the health of all Georgians and to expand access to affordable, quality healthcare for underserved individuals and communities.

B+A has worked to assure the economic viability of the nation's trauma centers and systems for 24 years. This report outlines key issues and ideas for planning the trauma system for Georgia for the next decades.

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**MANY OPPORTUNITIES FOR THE GEORGIA TRAUMA SYSTEM**

Georgia is experiencing a crisis in the capacity of the state's trauma centers to care for those who are seriously injured throughout the state. Critical factors in this system that serves all Georgians, regardless of their income, include:

- Not enough trauma centers, particularly in the southern part of the state;
- Declining number of surgeons in key trauma specialties who are available to participate in trauma care;
- High and growing proportion of uninsured trauma victims;
- Lack of coordination of access to assure that all patients receive necessary care at the appropriate hospital;
- Antiquated rural emergency medical services (EMS) system that is fragmented and under resourced.

These issues are common in states across the nation, and particularly in the South and Southwest where there are high proportions of uninsured and large rural areas. What is uncommon is the unprecedented focus on and commitment to trauma care from Georgia's Governor, Lieutenant Governor, State Legislature, and hospital, medical, EMS and philanthropic communities. This high level interest, reflected in \$58.9 million in initial funding, enabled the state's trauma system to rapidly stabilize, existing trauma centers to strengthen their programs, and the Georgia Trauma Care Network Commission to move forward on planning an optimum system for the decades ahead.

This project enjoyed broad collaboration from trauma and EMS stakeholders, and in addition to best practices from other states, benefited from many ideas from within Georgia on how to assure excellent care for all who are seriously injured. It dovetailed with the work of the Georgia Trauma Care Network Commission, and while this report does not speak for the Commission, the product is much better as a result.

Major opportunities identified include the development of a system to coordinate access of the seriously injured to trauma centers, the use of telemedicine to leverage scarce trauma medical staff resources, and the augmentation and regionalization of scarce EMS resources.

The overall opportunity is to develop a strong EMS/Trauma system that serves as a new pillar of support for the larger at-risk emergency health care safety net. Evolving problems with facility capacity, and physician supply and participation in emergency care go well beyond trauma care and will require a new regional support structure for trauma care to broaden to address other "time sensitive" conditions such as stroke, heart attack and other conditions requiring emergency surgery or treatment. This approach also assures the highest value for Georgia.

Based upon our experience in working with the nation's trauma systems for over two decades, we believe these opportunities, coupled with the state's strong commitment to trauma care, enable the development of a state-of-the-art system in Georgia that serves as a model for the nation.

## What Are Trauma Center Readiness Costs?

Trauma centers incur substantial "readiness costs" to maintain their 24/7 capability for emergency treatment of the seriously injured. They include:

- Medical staff specialty call
- 24 hour operating room staffing
- Added staff in emergency department, lab, radiology, ICU
- Management support
- Broad training of all providers
- Physician support personnel
- Injury prevention & outreach programs
- Social services and family support
- Transportation services

These costs would be eliminated if the trauma centers were to close. In 2006, they totaled \$44,063,224.

## What Is Georgia's Trauma Patient Severity & How Does It Compare?

The table below breaks down trauma patients treated in 2006 in Georgia trauma centers by injury severity.

Injury Severity	Patients	%	National Norm
Minor	4,132	36%	50%
Moderate	3,816	34%	30%
Major	2,016	18%	12%
Severe	1,354	12%	8%
Totals	11,318	100%	100%

The average patient volume was 1,636 for Georgia's four Level I trauma centers, and 526 for nine Level II trauma centers. (Two Level IV trauma centers averaged 39 admissions).

## How Does Trauma Care Payment in Georgia Compare to the U.S.?

Type of Insurance	Payer Mix	National Norm
Commercial	39%	51%
Other Ins.	7%	3%
Medicare	12%	12%
Medicaid	17%	18%
Uninsured	25%	18%
Total	100%	100%

## GEORGIA TRAUMA CENTER FINANCIAL VIABILITY

The 2006 financial performance of Georgia's current thirteen Level I and Level II trauma centers was assessed with the same methodology used by Texas, New Mexico, Oklahoma and Arizona to define their trauma system's needs. Essential findings are as follows:

### Major 2006 Financial Loss for Georgia's Trauma Centers

The table below presents the revenue obtained by Georgia's trauma centers in 2006, their costs for treating 11,318 patients of \$221 million, their extraordinary trauma center readiness costs of \$44 million, and the overall financial loss of \$70 million by Georgia's trauma centers in 2006.

Georgia Trauma Centers	Amount
Patient Care Revenue	\$193,199,255
Patient Treatment Costs	\$220,684,574
Trauma Center Readiness Costs	\$44,063,224
Total Trauma Center Costs	\$264,747,798
Loss On Trauma Center Operations	-\$70,748,543

### What Does This NOT Include?

This only includes trauma hospital costs for patients meeting stringent Georgia Trauma Registry criteria. It does *not* include the costs for physician and surgeon treatment, pre-hospital Emergency Medical Services transport and care, or burn center care and rehabilitation treatment for these patients. It also does *not* include care of the seriously injured who do not reach trauma centers, treatment of those with less severe injuries, and treatment in out-of-state trauma centers.

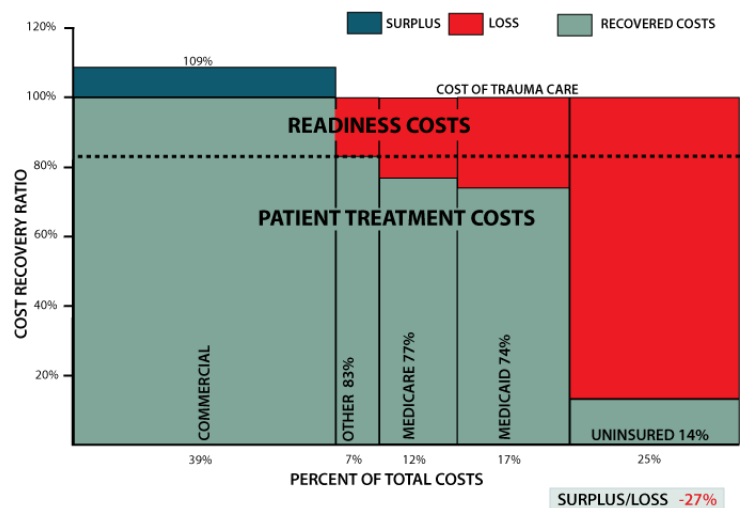
### Who Pays For Trauma Care In Georgia?

The table below incorporates total trauma center costs (including readiness costs) and revenue for each payer type, along with the cost recovery rate (CRR), or revenue divided by costs.

Payer Class	Total Costs	Percent of Cost	Revenue	CRR
Commercial Ins.	\$104,396,705	39%	\$113,605,242	109%
Other Insurance	\$17,512,330	7%	\$14,552,021	83%
Medicare	\$30,819,066	12%	\$23,658,168	77%
Medicaid	\$44,584,449	17%	\$33,048,395	74%
Uninsured	\$67,435,248	25%	\$9,135,428	14%
Total	\$264,747,798	100%	\$193,999,255	73%

The graphic at right profiles this information and shows the proportion of costs incurred by patients in each payer category that were covered by revenue.

Readiness and patient treatment costs are indicated along with a surplus on patients with private insurance.



New initial state funding in 2008 has reduced these

losses substantially and brought increased financial stability to Georgia's existing trauma centers.

## PATIENT ACCESS TO TRAUMA CENTERS

### Do Trauma Patients Reach Trauma Centers In Georgia?

The hospital data set in Georgia includes all discharges from all hospitals in the state. The following table shows all trauma inpatients treated in Georgia by level of injury, and whether they were treated in a trauma center or not.

Injury Severity	Minor	Moderate	Major	Severe	Total
Level I TC Patients	1,447	1,845	1,618	737	5,647
Level II TC Patients	1,339	1,835	1,367	502	5,043
<b>Total LI/LII TC Patients</b>	<b>2,786</b>	<b>3,680</b>	<b>2,985</b>	<b>1,239</b>	<b>10,690</b>
Non-Trauma Hospitals	4,191	4,695	1,815	287	10,988
<b>Total GA Trauma Volume</b>	<b>6,977</b>	<b>8,375</b>	<b>4,800</b>	<b>1,526</b>	<b>21,678</b>
<b>% of Trauma Patients Treated at Trauma Centers</b>	<b>40%</b>	<b>44%</b>	<b>62%</b>	<b>81%</b>	<b>NA</b>

These percentages are much higher in functioning trauma systems, where virtually all severely injured trauma patients (unless too unstable to transport) and most patients with major injuries would typically be treated in a trauma center. In Georgia, a substantial portion of the seriously injured who should be treated in a trauma center are not.

### How Well Does The Trauma System Function Regarding Patient Flow?

The survey of trauma centers also identified key factors/findings that help clarify how well Georgia's trauma system is functioning. Essential findings include:

- Six trauma centers cannot handle all appropriate requests for patient transfers.
- Ten trauma centers cannot repatriate patients back to their own community.
- Eight trauma centers indicated they receive inappropriate transfers from other hospitals.
- Ten trauma centers report problems in quality of care before transfer.
- Ten trauma centers have difficulty transferring patients to rehabilitation.
- Four trauma centers report inadequate EMS ground transport and air medical transport resources.
- Two Level II trauma centers have difficulty transferring patients to Level I centers.

The most common complaint was "it has taken several hours and numerous calls before finding an accepting facility," due to a lack of bed availability and lack of physician coverage.

### Poor Uninsured Patient Access To Rehabilitation

All Level I and four Level II trauma centers reported significant challenges in transferring uninsured and underinsured patients needing rehabilitation. This requires they be kept in a more costly acute care setting, which increases the centers' length of stay, adds costs, and inappropriately uses scarce hospital beds which are no longer available for other patients.

These survey results reflect a system with patient flow issues at every level: pre-hospital, key entry points, within the system, and post-acute care/rehabilitation.

## THE REGIONAL TRAUMA CENTER

When a Level I or II trauma center is established, paramedics transport injury victims meeting special triage criteria past local hospitals to a waiting trauma team. These teams are composed of a trauma surgeon, emergency physician, several trauma nurses, personnel from radiology, blood bank, and others. Up to 16 physicians in specialties ranging from neurosurgery to OB/GYN are on standby, and nursing teams are ready in the operating room and critical care unit as well.

Consolidating major injury patients into a small number of hospitals serving as regional trauma centers produces a high level of expertise and supports the specialized resources required for optimum care. This approach is highly effective in saving lives.



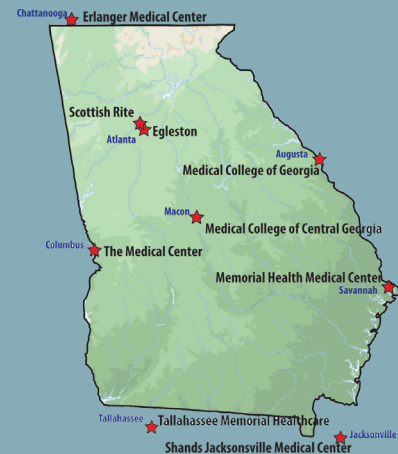
### CAUSES OF TRAUMA IN GEORGIA

The table below shows the type of injuries treated by Georgia's trauma centers in 2007. About half of trauma center patients are victims of motor vehicle crashes, and a quarter are injured in falls.

Trauma Center Patient Cause of Injury	%
Motor Vehicle Crash	47%
Fall	23%
Assault	17%
Other Accident	8%
Recreational Accident	5%
Total	100%

## PEDIATRIC TRAUMA SUB-SYSTEM

Georgia enjoys an exceptionally strong array of pediatric trauma centers that are well located to care for seriously injured children under age 15. They account for 12% of trauma center patients and require a different system than adults due to their specialized needs. A map showing pediatric trauma centers is below. They are Children's Healthcare of Atlanta (CHoA) Egleston and Scottish Rite Children's Hospitals, Memorial Health Medical Center, Medical Center of Central Georgia, and Medical College of Georgia.



Children seriously injured in Northwest Georgia can be taken to the pediatric trauma program at Erlanger Medical Center in Chattanooga, and those in South Georgia can be taken to pediatric trauma centers in Jacksonville and Tallahassee, Florida. The Medical Center in Columbus also treats a significant number of injured children.

The best practice for treating seriously injured children is within a pediatric trauma sub-system resourced to meet the unique challenges presented by children, especially very small ones. Building this sub-system is essential to fully utilizing Georgia's expansive pediatric trauma resources. State EMS reports that they have the weakest vision for the pediatric component of the statewide trauma system as they are focusing on the adult component.

## Strengthening Georgia's Pediatric Trauma System

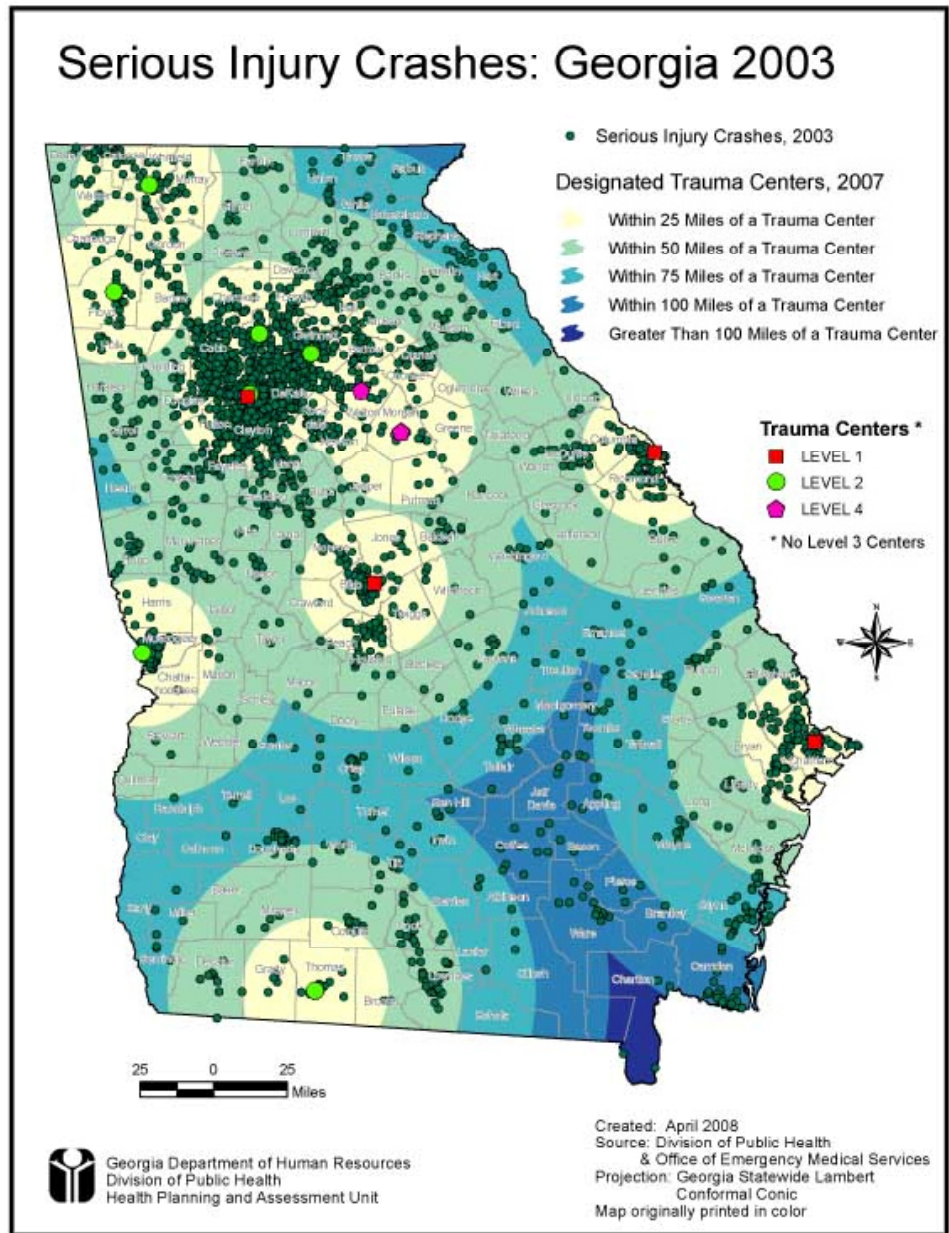
An initiative by the pediatric trauma providers is underway to effectively implement measures that assure seriously injured children in Georgia have timely access to quality trauma care in adequately supported pediatric trauma centers.

## DEVELOPING TRAUMA CENTER CAPACITY IN RURAL GEORGIA

Georgia's Office of Trauma/EMS has identified the need for additional Level II and III trauma centers in rural areas outside the Atlanta metropolitan region due to the inability of current trauma centers to accommodate patient volume and long transport times that are required due to the absence of a trauma center in reasonable proximity.

### Rural Georgia Trauma Centers

The map below, prepared in 2008 based upon 2003 data by the Georgia Division of Public Health, indicates the location of serious injury crashes and adult Level I, II and IV trauma centers. It also identifies the areas within 25, 50, 75 and 100 miles of each trauma center.



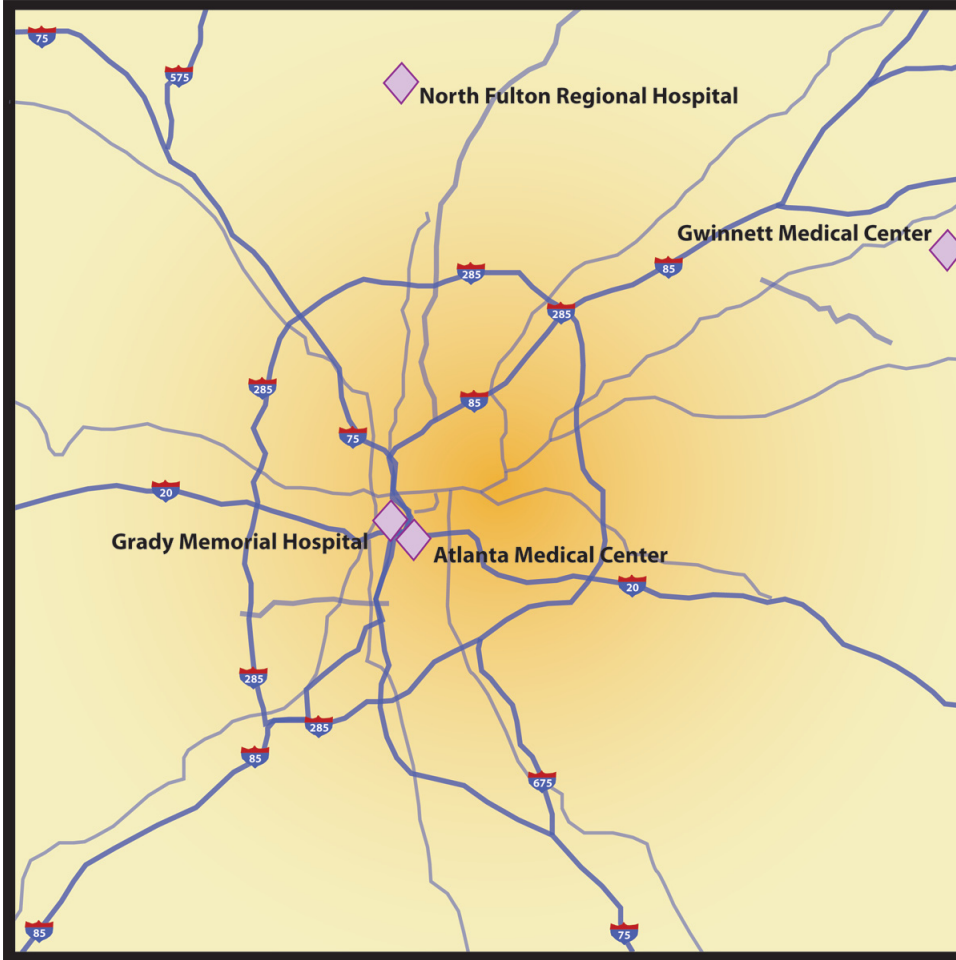
The result is that there are large portions of Georgia that are beyond 50 miles of a trauma center. This means that the time it will take to stabilize and transport the seriously injured from these areas (medium and dark blue) to a trauma center will exceed the "golden hour", the point at which their prospects for survival start declining rapidly.

The map indicates this problem is most prevalent in southern Georgia. Data from Georgia's hospital discharge information set indicates that there are hospitals located in such "underserved" areas with substantial volumes of trauma patients that may be interested in serving as trauma centers due to new state funding.

## EXPANDING TRAUMA CENTER CAPACITY IN THE ATLANTA REGION

Four adult trauma centers serve a population of 3.8 million in the greater Atlanta region composed of Clayton, DeKalb, Douglas, Fulton, Gwinnett, Rockdale, Cobb and Newton Counties. They are Grady Memorial Hospital and Atlanta Medical Center in the central city, and Gwinnett Medical Center and North Fulton Regional Hospital in the northeast.

A map indicating hospital locations where trauma patients are currently treated is below. Ideally, two additional Level II trauma centers would be developed along or near the I-285 Beltway south and east of Atlanta.



Georgia's Office of Trauma/EMS has identified the need for 1-2 additional adult Level II trauma centers in the Atlanta region due to:

- Inability of current trauma centers to accommodate volume demands.
- Evolving traffic patterns that increase transport times.
- Population growth which will result in additional trauma cases over time.
- Atlanta trauma centers' role in receiving trauma cases from the greater region and backing up trauma centers throughout the state.

While new trauma funding may incentivize existing trauma centers to expand capacity, transport times in this highly populated region may indicate the best alternative may be to encourage the development of additional regional trauma centers east and south of Atlanta.

## INTERSTATE TRAUMA TRANSFER STABILITY

Some regions in Georgia rely on trauma centers located in adjacent states due to proximity (e.g., Tennessee, Florida), and the stability of these resources are essential to the Georgia Trauma System.

Erlanger Medical Center in Chattanooga, TN treats 411 patients with major or severe injuries whom are transported from Georgia; this is about 10% of such patients treated by all Georgia trauma centers.

In addition, Georgia trauma centers receive and treat trauma patients residing in other states, particularly South Carolina. Across the U.S., regional and interstate collaboration is materializing on such issues, and they will need to be addressed by the Georgia Trauma System.



## TRAUMA CENTER MEDICAL STAFF

Up to 16 surgical and medical specialists need to be available to a trauma center at all times:

Trauma Surgery	Anesthesiology
Emergency Medicine	Orthopedic Surgery
Neurosurgery	ENT Surgery
Plastic Surgery	Hand Surgery
Oral Surgery	Ophthalmology
Vascular Surgery	Critical Care
Cardiac Surgery	OB/GYN
Radiology	Pediatric Surgery

Up to 200 physicians are needed to support one trauma center. If one major specialty is unavailable, the trauma center diverts patients requiring trauma care to other facilities.

For most participating physicians, trauma care is a small and often problematic part of their practice that interferes with their elective schedule and personal lives. It is a burdensome responsibility that they have taken over from other physicians at other hospitals that have limited their call coverage.

Key factors driving this nationwide trend include:

- Incompatibility of trauma care with private practice;
- Detrimental impact on lifestyle and family;
- Increasing burden of uninsured patients;
- Surgical sub-specialization;
- Malpractice market turmoil;
- Physician payment systems that penalize trauma care;
- Reductions in resident support;
- Outpatient surgery and specialty hospitals that take surgeons out of hospital call systems.

### **Air Force Pilots**

*In 1994, the re-enlistment rate of Air Force pilots was 81%. By 1999, it had dropped to 30% because the pilots wanted to spend more time with their families.*

## STRENGTHENING PHYSICIAN PARTICIPATION IN TRAUMA CARE

The essential challenge facing Georgia is strengthening trauma medical staff support in the face of a nationwide trend of declining numbers of surgical specialists interested in trauma care. The following chart summarizes Georgia's Level II trauma center survey responses regarding the strength of the major specialties on their trauma medical staffs. The rating scale is: 1=not a problem; 2=somewhat of a problem; 3=significant problem; or 4=extreme problem. Key factors for strong, stable, long term medical staff support are as follows:

Level II Trauma Centers	Avg.
Trauma Surgeon	3.05
Neurosurgery	3.43
Orthopedic Surgery	2.99
Facial Fracture	3.36
Anesthesia	2.27
Other (Hand)	3.92
Ave.	3.17

### STRATEGIES FOR STRENGTHENING TRAUMA PHYSICIAN SUPPORT

Overall, trauma medical staff support in Georgia is very weak, placing an even higher burden on those physicians who continue to participate. Strengthening trauma physician support in Georgia, particularly in the face of declining numbers of surgeons, will be difficult. The following strategies should be considered:

#### **Develop Corps of Trauma Physician Extenders**

Physician extenders have quickly become valuable members of trauma teams across the country. They include Nurse Practitioners, Physician Assistants, Registered Nurse First Assists, and Trauma Nurse Specialists, and function with an expanded scope of practice to support trauma centers and surgeons. Georgia should define trauma physician extender roles, and then recruit and train them.

#### **Expand Trauma Surgeon Training & Retraining**

To augment the supply of trauma surgical specialists in rural Georgia, expanded trauma physician training at Level I trauma centers is needed. Also, existing surgeons interested in pursuing additional training in trauma care should be encouraged and supported to do so. This should include expanded continuing medical education for physicians participating in trauma care in the state.

#### **Maintain Strong Liability Protection For Trauma Physicians**

A major issue among physicians considering participation in trauma call is malpractice risk, or the notion that they will incur an inordinately higher risk of being sued if they do so. Relative to other states, Georgia is doing an excellent job on malpractice, particularly for physicians engaged in trauma and emergency care. The focus for the future should be to sustain the current legislation.

#### **Compensate Trauma Physicians Fairly**

Not only do trauma physicians treat a higher proportion of uninsured patients, when they respond emergently to a serious injury, they are paid the same by insurance companies as when they do a regularly scheduled surgery (try calling the plumber in an emergency). This inequity needs to be corrected and surgeons with heavy trauma call burdens should be compensated for the sacrifices they make in maintaining "readiness", or their availability.

#### **Manage Trauma Patient Flow**

A transfer system that manages the flow of trauma patients, including minimizing unnecessary patient transfers to a trauma center, will reduce their disruptive impact on participating surgeons. The development of community call systems for high demand, low supply trauma specialties (hand, eye, etc.), and the use of telemedicine to leverage scarce trauma physician resources can also help.

#### **Engage As Many Surgeons as Possible In Trauma & Emergency Call**

The domino effect of surgeons leaving call panels, requiring the remaining surgeons to do more, must be reversed. It may be possible to do so, since the problem in most specialties is not so much a shortage of surgeons but a shortage of surgeons wanting to take trauma and emergency call.

## STRENGTHENING EMERGENCY MEDICAL SERVICES IN GEORGIA

The response to Georgia's trauma center crisis was to establish and fund the Georgia Trauma Care Network Commission (GTCNC). Due to obvious needs among Georgia's many Emergency Medical Services programs, the integral relationship between EMS and acute trauma care, and burgeoning practices in other states, the GTCNC has appropriately taken on significant responsibility for strengthening EMS as well.

This should grow over time into a fully integrated EMS/Trauma initiative that assures high quality emergency care for all Georgians, regardless of the type of injury or illness they present.

### Build A Strong Structure By Consolidating EMS Districts

The starting point for the future should be the excellent work of the Senate Study Committee on EMS Recruitment, Retention, and Training in Georgia, which recommended the following as priority solutions:

1. Increase Medicaid reimbursement rates to Medicare reimbursement rates.
2. Eliminate or reduce ambulance license fees.
3. Establish a funding source for trauma care.
4. Create an alternative state certification exam for EMTs and Paramedics.
5. Create a stand-alone Office of EMS/Trauma or re-organize the current placement and structure of the Office of EMS/Trauma (OEMS/T).
6. Provide stable and permanent funding for the Office of EMS/Trauma.
7. Develop and provide full funding for EMS Instructor and EMS program for personnel at Georgia Public Safety Training Center (GPSTC).
8. Develop a director's program for human resources and leadership training.
9. Develop high school recruitment & training programs.
10. Develop insurance coverage for EMT drivers between 18 and 21 years.
11. Develop a "mobile" retirement fund for EMS personnel.

Several of these recommendations have been or are being implemented, and the balance of these objectives should be pursued until completed.

### A Starting Point For The Future Of EMS In Georgia

Georgia has a strong cadre of EMS personnel with excellent leadership, but as a system EMS is hindered by its fragmentation between the state's high number of small county jurisdictions. Historically EMS operations have been developed and funded by local entities, primarily in more rural areas by County Government. As is happening in other states, Georgia must move towards a regionalized structure for EMS system design to serve the most patients in the most effective and efficient manner.

Many rural EMS organizations in Georgia should be combined to create regional EMS districts with special taxing authority based on population, geography, and patient flow patterns. These larger systems would provide more stability to EMS employees, fewer ambulances would be needed round the clock due to dynamic use of the resources, and employees could enjoy higher salaries along with better equipment and training due to better use of resources. The bottom line would be to provide faster response times with personnel that provide a higher quality of care. This can be accomplished through a regional EMS/trauma infrastructure offering economic incentives based on performance improvement.

### A Vision For The Future Of EMS In Georgia

Georgia has the opportunity to establish a highly efficient model EMS system. An effective, integrated structure and the use of new technology to track and route air and ground ambulances will enable EMS to establish a state-of-the-art system that together with trauma care advances produces a new public service for Georgia. With an effective structure in place, the addition of telemedicine will enable all trained EMS personnel to function as physician extenders. This potentially adds great value beyond emergency care by expanding EMS's role, when not emergently occupied, to serve other health needs in rural counties where health care resources are increasingly scarce.

## AIR MEDICAL TRANSPORT IMBALANCE

Trauma centers were asked "Does your region have adequate air medical transport resources?" The results indicate perhaps more than enough helicopters in north Georgia and none southwest of Macon. (A grant to build a helicopter landing pad at the Level I trauma center in Macon will help attract air service.)

This imbalance presents problems, particularly when timely transport of critically injured patients is needed. A surplus of "birds" also presents problems in that they inevitably end up transporting patients with minor injuries at needless cost and risk.

Regulation of air medical transports has become a national issue due to a slew of fatal crashes which have highlighted the risks, and mounting evidence of over use. Georgia is beginning to regulate air medical providers, and to optimize the role of air transport within the emerging Georgia Trauma System, the following objectives should be considered:

- A coordinated approach by air medical providers to assure full coverage of Georgia.
- Clear criteria on when "birds" should liftoff based upon patient condition, transport time and weather conditions.
- Policy on when to transport lesser injured patients by air when EMS ground units would otherwise be out-of-service for a prolonged period of time.

### TELEMEDICINE IN TRAUMA



Use of telemedicine technology in trauma care benefits injured patients, rural providers who are in short supply, as well as urban surgical specialists.

In Georgia, there is experience in using as well as a developing infrastructure to support it statewide. In trauma care, telemedicine would enable local hospitals to effectively evaluate injuries to determine the best course of initial treatment as well as whether the patient needs to be moved to a trauma center.

The shortage of pediatric neurosurgeons provides an excellent opportunity for the use of telemedicine. Instead of flying a child with a suspected head injury to a pediatric trauma center, the child could be evaluated remotely at the local community hospital by a neurosurgeon based at the pediatric trauma center.

This will enhance and expedite care of children with serious injuries, and enable local providers to care for children with minor injuries who otherwise would be transported away from their community for treatment at a high cost in a already overburdened pediatric trauma center.

Second to trauma center capacity, the most immediate problem facing trauma care in Georgia is the chaotic non-system for transferring patients to trauma centers. The results include severely injured patients being transferred to distant out-of-state trauma centers while their region's trauma center had beds filled with patients who should have been treated at their local hospital.

Mississippi, Oklahoma and Alabama, experiencing similar problems as Georgia in assuring timely access to trauma centers, have developed collaborative real time systems that coordinate trauma patient transfers between hospitals. Many urban regions have also developed collaborative real-time systems that direct EMS ground unit flow to distribute emergency patient demand based upon available hospital resources.

Due to a concurrent initiative led by the Georgia Hospital Association to solve the emergency department diversion problem, Georgia has the opportunity to build the nation's first comprehensive "air traffic control" system for trauma and emergency patient transport and transfer. The state is also poised to go an important step further and develop an integrated telemedicine system to bring the doctor remotely to the patient when moving the patient is problematic.

### Trauma/Emergency Transfer Centers (TETC)

Regional TETC's (integrated statewide) route inbound ambulances and helicopters with injured patients to the closest trauma center that is resourced in terms of physician and nursing staff, bed availability, and equipment to best meet the patient's needs. Transfer centers also help rural physicians easily coordinate the transfer of critically injured patients to a regional or tertiary trauma center. Doing so saves precious time in moving the patient to the trauma center best able to provide treatment in terms of both capability and cost.

TETC functions\* would include:

1. Monitor, in real time, levels of hospital and ER occupancy, on-call staffing, and ambulance diversion status throughout the region.
2. Provide "one call" assistance to ensure that "the right patient gets to the right hospital at the right time" by helping:
  - a. Inbound ambulance crews transporting a critically ill or injured patient find the nearest appropriate hospital that can meet their patient's needs.
  - b. Rural practitioners needing to transfer a child or adult with life-threatening injuries or a medical emergency to find the most appropriate tertiary-care facility.
3. Create "situational awareness" for state and federal emergency operations centers (EOCs) so they can quickly and efficiently distribute casualties to hospitals and track care capacity before, during and after large scale disasters and other mass-casualty events.
4. Ensure accountability by monitoring hospital compliance with state standards for trauma and emergency care availability, EMS diversion, system performance and response.

### Structure For Georgia

Georgia's trauma system development should include a regional transfer system organized at the four Level I trauma centers, integrated statewide with EMS regions, and common technology to optimize efficiency. These trauma centers would take responsibility for building patient transfer collaboration among hospitals within their regions. A statewide pediatric trauma transfer sub-system should be incorporated to focus on unique needs presented by injured children.

*\*From Art Kellerman, MD, Emory University*

## TRAUMA SYSTEM REGIONALIZATION IN GEORGIA

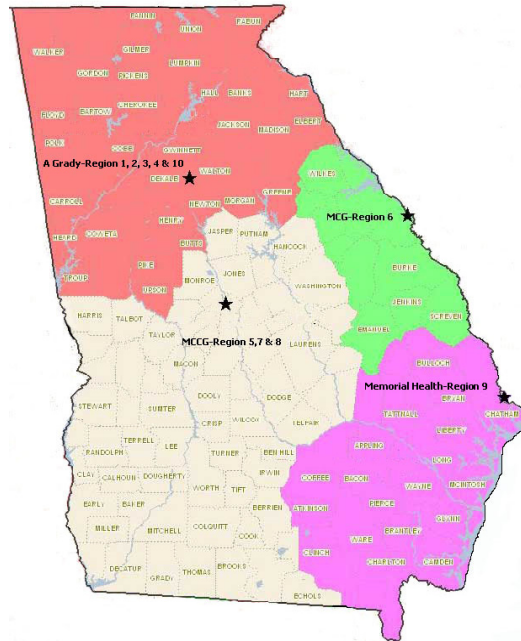
Key lessons from other states in building a strong and effective infrastructure to support trauma and emergency care include:

- Build a statewide system that incorporates all local and regional stakeholders and integrate them into a regionalized network.
- Define regions by patient referral patterns to enable participants within traditional catchment areas to work together with the major referral hospital.
- Provide technical assistance and basic operational funding to help regional groups organize.
- Build it for the long term and make it expandable to emergency care and related functions.
- Foster a grassroots network that generates statewide public support.

### A Starting Point For Georgia

As Georgia considers regionalizing its trauma system, the first step is to define regions. Current regions formed for EMS, emergency management, healthcare, public health, etc. should be considered. In defining trauma regions, a best practice based on the experiences of other states is to define regions based upon established trauma patient referral “watersheds” or catchment areas surrounding regional trauma centers.

Georgia enjoys well positioned Level I trauma centers, and if they serve as a focal point for trauma regions that incorporate EMS regions, the map at right indicates the regions that would logically follow.



*Potential Trauma Regions*

### Possible Regional Functions

In addition to general trauma system development, key functions of trauma regions (in conjunction with EMS Regions) may include the following:

- Coordinate/sponsor paramedic, nurse and physician provider education within the region.
- Support Level I trauma center in developing and operating trauma patient transfer systems.
- Coordinate with out-of-state trauma centers serving Georgia regions, and with regions in adjacent states (i.e., South Carolina) serving Georgia.
- Work within EMS regions to incentivise and facilitate the integration of county/EMS agencies into more cost-effective regional sub-systems.
- Foster public participation in activities such as injury prevention as well as public education and support for the essential public services of trauma/emergency care.
- Coordinate with other agencies/regions or absorb functions for disaster and terror preparedness.
- Support a telemedicine link between referring ED's with the Level I & II trauma centers to optimize quality of care and minimize unnecessary transfers.
- Develop a regional trauma system website to enable/enhance communications and participation among integrated organizations.
- Conduct regional medical peer review and system performance improvement.
- Evolve system to include time sensitive emergency care issues.

## TRAUMA CENTERS HAVE A LEAD ROLE IN DISASTER/TERROR EVENT RESPONSE

Trauma centers are able to amass the needed resources to respond to major disasters and mass casualties by scaling up their everyday operations. Ongoing relationships with EMS and other hospitals result in rapid patient triage and treatment decisions in community crises of all types.

Because trauma centers have larger capacities, unique staffing, and enhanced training programs, they are the logical base (in collaboration with regional EMS and homeland defense personnel) to coordinate hospital response to terror and disaster events. This has proven to be the case in North Carolina, Texas and Oklahoma, and is emerging as an evolutionary trend in other states.

## BUILDING AN INFRASTRUCTURE FOR TRAUMA & EMERGENCY CARE

### INJURY PREVENTION: THE HIGHEST VALUE

Fire departments are a great example of a public good that broadened its mission to provide a higher value to the public by working to prevent fires rather than just put them out. Trauma center personnel, driven by the carnage they witness, are uniquely suited for work on preventing injury, but are rarely given the resources to do the job. Washington and Maryland are good examples of states that use trauma care in this prevention role.

### Community Focal Point on Injury

Trauma centers are uniquely suited to fill this role, which incorporates the following functions:

1. Identify injury causes that are subject to intervention.
2. Define solutions proven effective in similar circumstances.
3. Focus media attention and community resources on the specific cause of injury.
4. Foster and coordinate the development of interventions.
5. Evaluate the effectiveness of specific prevention programs.

### A TRAUMA PUBLIC AUTHORITY MODEL FOR GEORGIA

Examples in Georgia include the Georgia Building Authority, the Georgia Ports Authority, Georgia Regional Transportation Authority, Georgia Lottery Corporation, Georgia Technology Authority, Georgia Public Broadcasting, and the Stone Mountain Memorial Association.

A basic trend is that as a trauma system is built, those involved recognize that regional trauma care cannot operate on its own in a vacuum. Increasingly, emphasis is placed on related services such as EMS, air transport, emergency surgery, rehabilitation, burn care, prevention, etc.

It is also becoming apparent that while serious trauma cases are perhaps the most emergent, other emergency care challenges such as stroke and emergency surgery need the same “systems” approach and should be incorporated in Georgia’s Trauma/EMS systems. The result is that trauma and emergency care are emerging as a new public good like police and fire services.

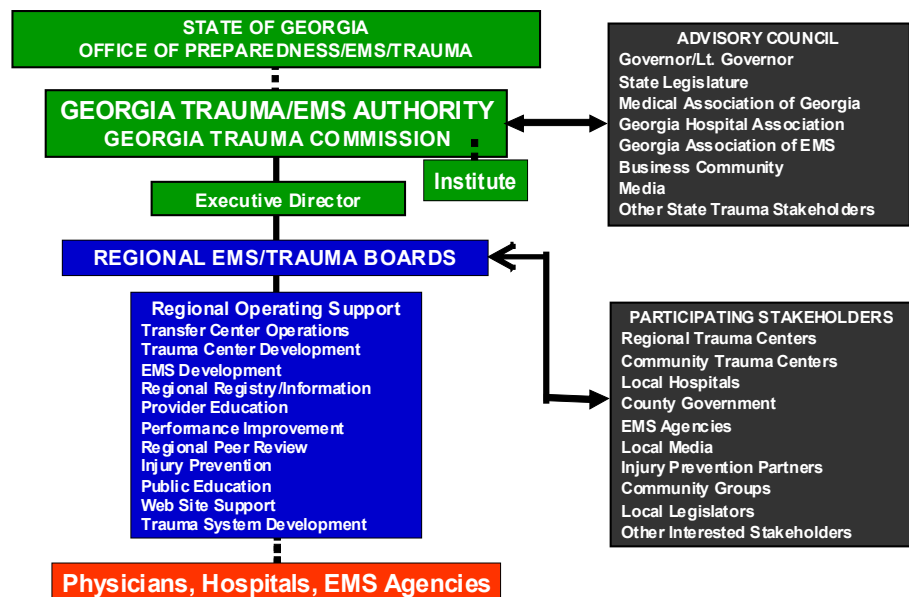
Georgia’s challenge is then to build an infrastructure that will support this new public good over the long term. This goes well beyond the traditional trauma system model built around a “lead agency” with authority to designate trauma centers. Therefore, Georgia will need to draw upon the experience of relatively few states and design its own.

### Trauma System Infrastructure In Other States

A broad range of trauma system infrastructures have developed in many states across the nation, offering many alternatives for Georgia as it develops its own:

- Maryland’s comprehensive system best exemplifies trauma and emergency care being an essential public good that ranks along side police and fire services.
- Pennsylvania is an example of a public authority model in which the state delegated authority over trauma care to the Pennsylvania Trauma Systems Foundation.
- New Mexico (like Georgia) delegated funding decisions to a Trauma Commission.
- North Carolina and Texas are examples of regional trauma system infrastructures that have expanded to incorporate EMS and homeland security functions.
- Oklahoma best exemplifies an integrated, regionalized trauma system infrastructure anchored by urban trauma centers serving large rural areas with a statewide transfer system that can respond in real time to volume surges at individual trauma centers by redirecting transports to the next closest facility.

## GEORGIA EMS/TRAUMA AUTHORITY



## BUILDING A NEW PUBLIC SERVICE FOR GEORGIA

Georgia has the opportunity to not only catch up with the rest of the country in trauma care, but also to help lead the nation by developing a new public service that assures emergent, high quality care throughout the state for the seriously injured, stroke and heart attack victims, and adults and children needing emergency surgery. This evolving vision for the Georgia Trauma System will bring a high value to everyone throughout the state, as well as their loved ones, who may require emergency health care.

### What Is The Best Way To Fund The Georgia Trauma System

There is a broad variety of sources of funding for trauma care that have been utilized throughout the nation. In most cases, state trauma funding strategies are defined by legislative experts who understand the prospects and stakeholders for each potential funding source. They can point out the path of least political resistance, as well as opportunities to collaborate with other stakeholders to jointly pursue new funding opportunities, thus consolidating political strength. This is the route Georgia's trauma care stakeholders have taken. Another best practice is to target a funding source with the following characteristics:

- Trauma related or tied to a major source of trauma
- Permanent source of funding
- Expands with population growth

Auto related sources, such as added fees on driver licenses, auto registrations, title fees, and auto insurance (over half of trauma injuries result from motor vehicle crashes) are classic examples. Fines related to activities such as drinking and driving and other moving violations also have a rational appeal since they can also help diminish such activities.

### How Can The Georgia Trauma System Be Held Accountable?

Accountability is essential to building an effective public service as it is the only way to assure the highest value is consistently pursued by all stakeholders.

Many trauma system performance factors are relatively simple to measure and should be:

- Time trauma centers are on diversion and deny access to injured patients.
- Percent of trauma patients who reach trauma centers (see page 3).
- Time of EMS transport from call to scene, and from scene to trauma center.
- Time from patient arrival in ED to the operating room for patients requiring emergency surgery.
- The "preventable" death rate for each trauma center and overall system.
- Severity-adjusted length of stay (proxy for costs) of trauma centers compared to national and state norms.
- Reductions in injuries targeted by injury prevention measures.
- Percent of air medical transports of trauma patients with minor injuries.

One of the hallmarks of trauma care in the U.S. is its tradition of aggressively monitoring performance through continuing systems review to assure that if mistakes occur, lessons are learned, and if there is a better approach to optimizing care to patients, it is taken. This approach should be extended to the system as a whole to assure not only the best care possible for the state's seriously injured, but the ongoing support needed from the State of Georgia.

## INVESTING IN THE GEORGIA HEALTH CARE SAFETY NET

When trauma systems start breaking down, the overburdened emergency care sector of the overall health care system starts breaking down as well. When a trauma center is full and cannot handle the next seriously injured patient, the patient goes to other hospitals and physicians who are then impacted like dominos and react to avoid such cases. Surgeons opt out of call panels for all patients, and paramedics are left to search for another hospital willing to accept the injured patient.

### Building a Strong Public Good

The converse can also be true. When a state builds a trauma system, it can strengthen its overall emergency care system. New surgeons available for trauma care are also available for other emergency surgical cases. Within a trauma hospital, a strong trauma service takes a major load off the overburdened ER. Ambulance GPS systems benefit all emergency patients. The regional infrastructure built to coordinate trauma patient triage, transport and transfer can also serve to consolidate fragmented county EMS programs into efficient regional EMS agencies.

### TRAUMA CENTERS ARE OPEN TO ALL

Regional trauma centers treat all patients who arrive at their doors, regardless of their ability to pay. There is no attempt to identify payment sources before treatment, as the patient's evaluation and treatment are priorities. A substantial portion of trauma patients are ultimately determined unable to pay for their care. When a trauma center closes, it closes to all.

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## **Trauma Centers – A Lesson from Vietnam**

Trauma Centers developed in the U.S. when the emergency medical service (EMS) system built by our military in Vietnam was brought home to America. They now anchor an EMS system that has lowered the U.S. death rate from assaults by 70%. Most patients taken to trauma centers are injured in motor vehicle crashes, where advances in treatment have had even more impact.