



**NASEMSO Monograph**  
**July 2010**

**Status of State Trauma System Planning and Development**  
*And Utilization of the HRSA Model Trauma System Planning and Evaluation Document*

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*National Association of State Emergency Medical Services Officials*

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July 30, 2010

Greetings,

On behalf of the National Association of State Emergency Medical Services Officials, I am pleased to present our latest monograph, "Status of State Trauma System Planning and Development." The monograph represents extensive work over the past year in instrument design, information gathering and data analysis.

In this study, we surveyed the status of state trauma systems by specifically examining the access and use of the Health Resources and Services Administration's "Model Trauma System Planning and Evaluation Guide" and its companion self-assessment tools. The monograph represents a snapshot in time of the status of our state trauma systems. This monograph can be used to identify strengths of our state trauma systems and can also be utilized to identify opportunities for improvement.

State EMS offices are often the organizational home for the development of these state trauma systems. The purpose of a state trauma system is to get the right patient, to the right facility, at the right time. The most severely injured patients are delivered to definitive care at designated trauma centers by licensed ground and air ambulances with well trained and certified EMS personnel. Utilizing standardized triage, treatment and transport guidelines, prehospital personnel provide early life-sustaining patient care in transit that improves patient viability and survivability before arrival to a trauma center for definitive care.

Rural hospitals play a key role in the inclusive trauma system through rapid assessment, stabilization and timely transfer of the most severely injured patients, if additional resources are needed. A well developed and coordinated system of emergency healthcare is essential to meet the needs of our communities on a daily basis. These valuable emergency healthcare resources are equally important to our communities in preparation and response to natural and human caused disasters.

We wish to thank the National Highway Traffic Safety Administration for the resources necessary to support this endeavor. I would also like to thank Jolene Whitney, Chair of the National Council of State Trauma System Managers/NASEMSO, for her guidance and expertise, as well as, our state trauma system managers who gathered and submitted their survey data. We hope you will find the monograph useful in enhancing the ongoing development of trauma systems, locally, regionally and nationally.

Sincerely,

Steven Blessing  
President, NASEMSO

## ***Acknowledgements and Disclaimer:***

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This report was prepared for the National Association of State Emergency Medical Services Officials by Stephen Hise of Hises, Inc.

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## ***Background and Introduction***

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The National Association of State EMS Officials (NASEMSO) is the professional organization of the administrative officials of EMS systems in each of the states, territories and the District of Columbia. As part of our core mission to improve emergency medical services nationwide, we conduct periodic assessments of state EMS systems to assist policy-makers in understanding the nature and scope of existing and emerging challenges.

Traumatic injury is one of the leading causes of death in the United States. It is routinely reported as the fourth or fifth leading cause of death and the number one cause of death for persons aged one to forty-four years.

In truth, it is difficult to compare the significance of traumatic injury with other diseases in part because of the way traumatic injury is categorized. For instance, mortality data separates unintentional injury (accidents) from intentional injury (homicide and suicide). While it is logical to assume a fairly large portion of deaths from these latter causes are in fact the result of traumatic injury (gunshots, stabbing, blunt-force trauma, etc...) clearly homicide and suicide can also incorporate non-traumatic means such as poisoning, drowning and drug overdose. Because of this, it is not satisfactory to simply add the numbers from these different classifications to derive a more accurate figure. Suffice it to say that the numbers of Americans who die each year from traumatic injury is rather larger than the data (as currently configured) indicate.

Regardless of this, traumatic injury has long been recognized as a major health problem. Military surgeons returning from the Korean and Vietnamese wars were shocked to find the probability of survival from injury higher on a battlefield than on the streets of America. This led to production of the 1966 white paper "Accidental Death and Disability: the Neglected Disease of Modern Society." This white paper is largely credited with giving birth to the modern EMS system, including the establishment of state EMS offices.

Because major trauma patients have extraordinarily high acuity, ambulance transportation or medical air evacuation are always indicated, necessitating the deployment of prehospital EMS. Ground and air ambulances are the means by which major trauma patients are delivered to definitive care at trauma centers. Ambulance personnel are also trained to provide sophisticated therapeutic interventions in transit that improve patient viability and survivability prior to administration of definitive surgical care at the trauma center.

Trauma systems are designed to address the needs of injured patients throughout the continuum from the traumatic event to final disposition, including rehabilitation with the ultimate goal being to return the patient to pre-event health status if possible. This requires a multi-system architecture that encompasses safety and prevention programs, early recognition of the traumatic event, rapid access to on-scene emergency care, transportation to a qualified hospital trauma center, prompt surgical assessment, intervention and management, and rehabilitation as indicated. Trauma systems must meet the needs of numerous individual patients from a myriad of traumatic events; but also must be able to surge up to meet a sudden influx of multiple patients from a natural or man-caused disaster. All aspects of the system must be adequately integrated and functioning cohesively to achieve the highest quality patient care and optimal outcomes.

In this monograph, we examine the general status of formal trauma system development in the states, and particularly the utilization of system development tools produced by NHTSA. In understanding the findings, there are two main provisos:

First, formal trauma systems do not exist in all states, and the state EMS office is not always the administrative repository of all trauma system components. In some cases, elements of the trauma system such as prevention and data analysis are organizationally situated elsewhere.

Second, because the state trauma systems that do exist evolved more or less organically, the systems are often not directly comparable. Each system has standards, criteria and requirements that have been uniquely developed to meet the political and fiscal realities of each state. This is true of state EMS systems in general. As a result, the definitions of terms, the inclusion and exclusion criteria for data systems, and processes for recognition of trauma centers are all quite different.

The survey instrument (see appendix) was designed to elicit information that would be useful in achieving an understanding of the general status of these systems. The purpose of this endeavor is neither to judge nor to rank the various trauma systems. Neither is it the intent to provide specific recommendations; but rather to contribute to a clearer understanding of what exists, so that both the challenges and opportunities of future system development can be more fully appreciated.

The survey population consisted of trauma system managers of the fifty States. Of the potential pool of 50 managers, 45 surveys were returned, for a 90 percent rate of return. A list of participating states is included in the appendix.

## ***Executive Summary***

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Traumatic injury remains a leading cause of death and disability in the United States 43 years after publication of the landmark National Academy of Sciences/National Research Council white paper “Accidental Death and Disability: the Neglected Disease of Modern Society.”

State EMS systems which promoted standards for ambulances and ambulance personnel were first instituted following federal leadership and funding provided in the Emergency Medical Services Systems Act of 1973. Trauma system development lagged behind, with the first state trauma systems beginning to take shape in the 1980s. In the decades since, state trauma systems are still in various stages of development.

In the 45 states responding to the 2009 survey, there are 1,280 trauma centers:

- 16 percent (201) of these facilities are level I centers.
- 21 percent (264) of these facilities are level II centers.
- 26 percent (329) of these facilities are level III centers.
- 34 percent (429) of these facilities are level IV centers.
- 4 percent (57) of these facilities are level V centers.

The vast preponderance of trauma system planning in the states has incorporated the HRSA Model Trauma System Planning and Evaluation (MSTPE) Guide and the Benchmarks, Indicators and Scoring (BIS) criteria.

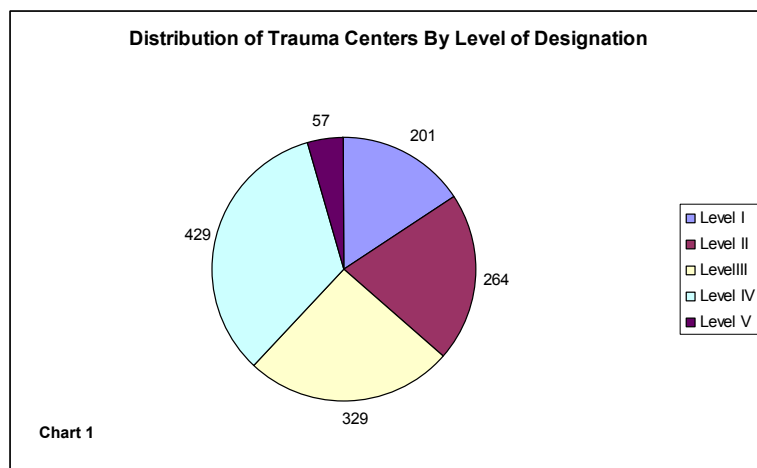
Of the 45 states in the survey 85 percent reported they have a state trauma registry. Of these, 95 percent are computerized registries.

Of the states with trauma registries 92 percent indicate they report trauma data to the National Trauma Data Bank.

Of state trauma programs in the survey 73 percent report accessing federal funding from at least one source. The Office of Rural Health and the Emergency Medical Services for Children program provided the most assistance to the most states.

## 1. Trauma Centers

A trauma center is a medical facility (usually a hospital) with significant resources dedicated to the rapid assessment and treatment of injured patients. There are five different classifications of trauma center distinguishing the array of services provided. A level I trauma center represents the highest level of resource availability. These facilities are usually large urban teaching hospitals that have the full complement of specialists and extensive resources to provide definitive care for every type of trauma. At the other end of the spectrum are the level IV and V facilities that are usually small rural hospitals or clinics with limited access to on-site trauma surgical expertise but that nonetheless are capable of providing early and critical life-sustaining intervention prior to transferring severely injured patients to definitive care.



In the 45 states responding to the 2009 survey, there are 1,280 trauma centers. Chart 1 at left shows the distribution, by level of these trauma centers. It is important to note that not all state systems recognize all 5 levels of trauma center designation.

The combined population of these 45 states (according to the 2000 census) is 246,919,335. This means there is one trauma center for every 192,906 persons. The total area in

square miles of these 45 states is 3,108,224. This means there is one trauma center per 2,428 square miles.

Of course, trauma center assets are not distributed evenly in either a geographic or population sense. Trauma centers usually exist in population centers, but that is also obviously also where the great preponderance of traumatic injury occurs. Still, serious injuries can and do occur on remote stretches of highway or in small towns and farms far away from a trauma center. Proximity to a trauma center with the capacity to rapidly deliver definitive surgical care and intervention doubtlessly improves survival, but comprehensive emergency medical services systems including medical air evacuation helps to mitigate this disadvantage to survival.

State trauma systems evolved from the ground up with little outside influence other than resource documents and intermittent grant support from the federal government. As a result, the state systems have a heterogeneous approach to trauma system design, development and administration. Not all states recognize trauma centers, and of those that do, not all recognize each level of trauma center.

Of the 45 states responding to the survey, 89 percent recognize level I trauma centers; 91 percent recognize level II trauma centers; 76 percent recognize level III trauma centers; 53 percent recognize level IV trauma centers; and 18 percent recognize level V trauma centers.

The criteria used to evaluate the trauma centers vary among states and even within states between levels of trauma center. American College of Surgeons Committee on Trauma

(ACSCOT) criteria for trauma centers is used by 41 percent of the respondents. Partial use of the ACSCOT criteria is indicated by 46 percent. Criteria other than ACSCOT are used by 13 percent.

Site visits to verify, or validate compliance with standards to recognize trauma center status is a requirement of 80 percent of the respondents. Some states appear to use ACSCOT criteria for certain levels (particularly the higher-level trauma centers) and not for other levels. Likewise, the composition of the site review teams varies between and with states, sometimes depending on the level of trauma center being reviewed. Use of ACSCOT site review teams (at least for certain reviews) is indicated by 12 states. The use of state review teams (at least for certain reviews) was indicated by 19 states. The use of a combination of teams was indicated by 11 states; and six states indicated use of other types of teams or strategies for site review.

Of the 36 states that require site review for trauma center recognition 31 also require re-review for renewal of the trauma center status. The designation periods range from one to five years, with a mode of three years for designation. Only 12 states charge a fee for designation.

## ***2. Stakeholder Groups and Program Staffing***

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Key parts of the development and administration of state trauma systems are reliant on expert advice derived from advisory and oversight groups and the work of program staff.

Of the 45 states responding 41 indicated the presence of stakeholder groups with a role in the statewide trauma system. Formally established stakeholder groups are established in 33 states. Regional trauma stakeholder groups are recognized in 27 states. Of these, 22 states indicated formal status for their regional trauma groups.

These advisory and oversight groups often incorporate expertise from the trauma care community including trauma surgeons, trauma nurses, emergency physicians, trauma registrars, prehospital care providers, and hospital administrators. These areas represent the acute care phase but patients may need additional services before leaving the hospital or even post-discharge to recover optimal functionality. For this reason, rehabilitation expertise may be included in the stakeholder group for the trauma system.

The survey instrument asked participants to identify the specific ways in which rehabilitation expertise is incorporated into advisory and oversight bodies. Rehabilitation expertise is included in the state advisory committee level in 19 states. Rehabilitation involvement is at the regional council level in nine states. Rehabilitation is included in trauma data stakeholder groups in 12 states. Rehabilitation expertise is included in injury prevention in 11 states. Performance improvement incorporates rehabilitation expertise in eight states. Rehabilitation expertise is included for public awareness in six states; and in four states rehabilitation expertise is part of stakeholder groups dealing with education.

The average number of staff for a state trauma program is 2.97 FTE. The highest number of trauma staff reported was 12 FTE and the lowest reported was 0.1 FTE.

The instrument asked what types of functions the trauma program staff provided in support of the program. The data identified four broad areas of responsibility (trauma registry, trauma system development, trauma center designation, and trauma quality improvement) and one catch-all category of other trauma program responsibilities.

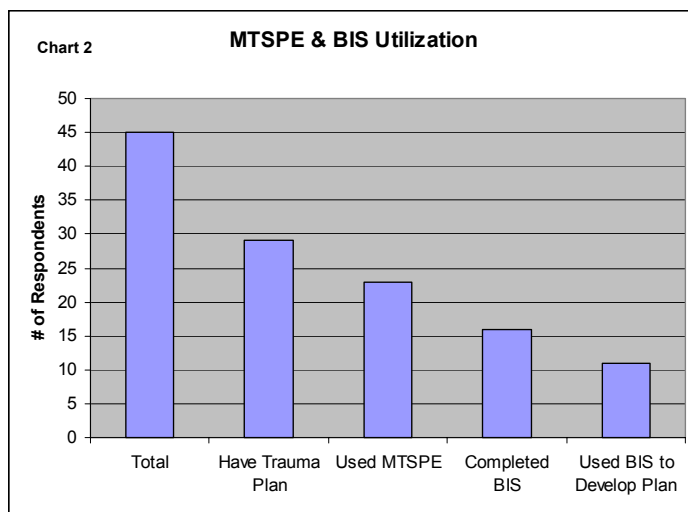
Distribution of responsibilities was surprisingly homogeneous. The most frequently identified trauma staff area of responsibility was trauma registry, with 29 states indicating their trauma program staff had some responsibilities in this area. Trauma system development responsibilities were listed as a program staff responsibility in 28 states. Trauma program staffs are responsible for trauma center designation processes in 26 states. Quality improvement is a responsibility of trauma program staff in 21 states. Other trauma program responsibilities for the trauma program personnel were indicated in 10 states.

### 3. Trauma System Planning and Preparedness

The Health Resources and Services Administration (HRSA) published the “Model Trauma System Planning and Evaluation Guide” (MTSPE) in 2006. The MTSPE document provides a common springboard for comprehensive trauma system planning, and includes an assessment tool called the Benchmarks, Indicators and Scoring (BIS) criteria. The BIS tool consists of benchmarks and indicators, each scored according to completion steps, using a 0-5 scale. The extent to which a system is developed is measured by these indicators. The BIS is designed to be a self-assessment tool, assisting states to identify needs within their own systems, to assist in trauma system planning and to measure progress over time.

#### A. System Planning

Of the 45 respondents, 29 (64 percent) have a formal state trauma plan. Of the 29 with state trauma plans, 79 percent used the MTSPE as a model to develop their plans. The BIS self-assessment tool was completed by 70 percent of those using the MTSPE. Among those that completed the BIS assessment, 69 percent used the tool to develop their state trauma plans.



Both the MTSPE and the BIS have been used in the vast preponderance of state trauma system planning. (See Chart 2.)

A statewide trauma system is complex and requires extensive coordination of policies, protocols and regulations to assure seriously injured trauma patients receive optimal care.

These protocols encompass patient triage, treatment, transfer and tracking. The protocols may be in effect at the local, regional, or statewide levels or at all three levels.

#### A-1 Triage Protocols

Triage is the sorting and classification of patients by severity of injury. Triage protocols take into account certain physiologic parameters (such as vital signs and level of consciousness), nature and extent of anatomical injury, the presence of co-morbid factors likely to impact survival, and the mechanism of injury to estimate potential injury severity sustained from the traumatic event.

Of those responding 32 states (71 percent)) indicated that a written protocol for trauma patient triage is in effect at the statewide level. The CDC/ACS field trauma triage guidelines or a modified version of these guidelines is in use in 24 of these states (75 percent). This represents 53 percent of the total survey group.

Nine states indicated the trauma triage protocol is implemented at the regional level. Of these, three (33 percent) use the CDC/ACS field trauma triage guidelines or a modified version of these guidelines.

Local implementation of trauma triage protocols are in effect in 12 states. Six of these (50 percent) use the CDC/ACS field trauma triage guidelines or a modified version of these guidelines.

#### ***A-II Trauma Patient Treatment Protocols***

Treatment protocols detail the specific interventions to be followed by prehospital EMS in the field management of injured patients. Treatment protocols are intended to expedite patient treatment, allowing emergency care to begin before contact is established with a medical control physician, and sometimes in lieu of contact with a medical control physician.

Of the forty-five states responding, 19 (42 percent) indicated the presence of a statewide uniform field treatment protocol. Eight states indicated regional protocols are in place, and 21 that local treatment protocols are in place. In some instances, states indicated the treatment protocols are in place at more than one level.

#### ***A-III Trauma Patient Transfer Protocols***

Trauma Patient Transfer Protocols address the movement of certain injured patients from one type of facility to another. Some severely injured patients may be taken initially to a hospital only for initial treatment and stabilization, or the patient may be diagnosed with a more serious injury after initial medical assessment, necessitating transfer to a higher-level trauma center with requisite specialty expertise. The intent of transfer protocols is sometimes achieved with other instruments such as voluntary interfacility agreements or through regulatory language.

Of the respondents, 22 (49 percent) indicated the presence of a statewide trauma patient transfer protocol. Regional transfer protocols are in place in 10 states; and 18 indicate that local transfer protocols are in place. In some instances, states indicated that transfer protocols are in place at more than one level.

#### ***A-IV Trauma Patient Tracking***

Because trauma systems overlap multiple other systems, the ability to track a patient through the continuum of care and across various jurisdictions requires a capacity to integrate information from multiple data sources. Comprehensive patient tracking is essential to the evaluation the utilization of and compliance with triage and transfer protocols.

A statewide trauma patient tracking system is in place in 21 (47 percent) of the 45 states in the study. Six states indicated trauma patient tracking is done regionally; and 14 states reported trauma patient tracking is done locally.

## B. Preparedness

Trauma systems are an integral component of emergency response in large-scale disasters. The organization of a trauma system's human and physical assets include the capacity to quickly identify, triage and treat large numbers of persons with multiple and complex injuries. Physical assets include the trauma centers, and both air and ground ambulances. Human assets include the physicians, nurses and emergency medical personnel involved in the trauma system. In addition to adequate planning, training is an essential component of readiness.

### *B-I State Trauma Program Integration with State Disaster Planning*

Less than half of the states responding to the survey indicated the state trauma program has an identified role in the state disaster response plan. State trauma programs *do not* have an identified role in the state disaster plan in 23 (51 percent) of the states. That the trauma system will be involved during any large-scale disaster with mass casualties seems doubtless. It may be that these state disaster response plans incorporate the elements of the trauma system without including the trauma program itself.

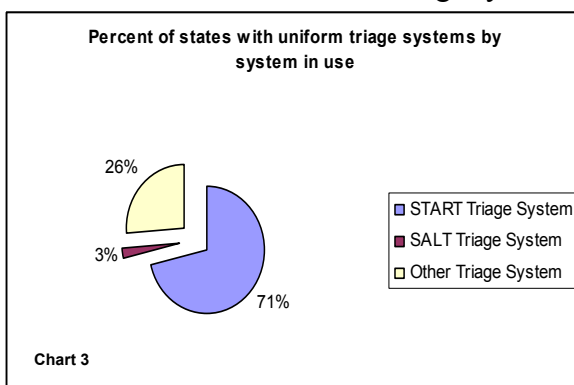
### *B-II Mass Casualty Incident (MCI) Plans*

Between the areas of routine operation (in which the ready assets are adequate) and disaster (in which the need for assets at multiple levels is exceeded), is the mass casualty incident. An MCI may involve a few or a few dozen seriously injured patients, but it is neither the nature nor the extent of the event alone that defines the incident; rather, it is whether the event creates a demand surge that exceeds or stresses the ready assets of the system capacity. In a community with only one active-duty ambulance, an MCI might be an automobile crash with five seriously injured patients. In such an instance, there is a sudden need for more human and physical resources than are immediately available. The MCI plan would have to be put into effect, calling in back-up ambulances, triggering mutual aid agreements, and preparing the local emergency room to receive a larger number of high-acuity patients than is customary. If the same incident were to occur in an area with a greater number of hospital and EMS assets, it may not trigger the MCI plan at all.

Only 15 states (about 33 percent) indicated the state trauma program has an MCI plan. As with disaster planning, this does not necessarily mean there is no statewide MCI plan, but rather, indicates a lack of trauma program involvement and authority in this area.

### *B-III Triage Systems*

The methodology of categorizing and prioritizing patients in either a mass casualty incident or disaster is called a triage system. It is highly desirable that these systems be



standardized since either a mass-casualty or disaster response will involve multiple agencies; it is optimal that resource allocation and patient care decisions be made according to the same decision scheme across the spectrum.

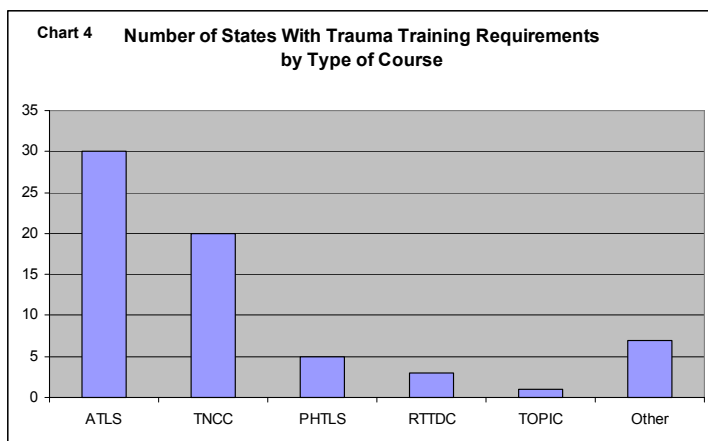
There are two triage schemes in wide usage: START (Simple Triage And Rapid Treatment) and SALT (Sort, Assess, Life-saving intervention, and

Treatment/Transport). Of these, the START system appears to be in much wider utilization with 25 states reporting its use as the uniform statewide trauma triage guideline. Only one state reported usage of the SALT protocol. Nine states use other triage guidelines. The percentage of utilization is shown in Chart 3.

#### 4. Trauma Professional Training Requirements

Training and professional development of the trauma workforce is critical to a viable trauma system.

There are several programs for trauma professionals including physicians, nurses and prehospital emergency medical personnel. Chart 5 shows the number of states that require each type of training program.



##### *ATLS (Advanced Trauma Life Support)*

This course was developed by the American College of Surgeons and is directed at physicians. ATLS is the first packaged trauma resuscitation course for physicians.

##### *TNCC (Trauma Nursing Core Course)*

This course was developed by the Emergency Nurses Association.

##### *PHTLS (Pre-Hospital Trauma Life Support)*

Shortly after the development of the ATLS Course, the American College of Surgeons Committee on Trauma (ACS/COT), and the National Association of Emergency Medical Technicians (NAEMT) entered into a cooperative agreement to develop PHTLS, an ATLS course for pre-hospital providers.

##### *RTTDC (Rural Trauma Team Development Course)*

This program was developed by the ad hoc Rural Trauma committee of the American College of Surgeons (ACS) Committee on Trauma (COT) to help rural hospitals with development of their trauma teams.

##### *TOPIC (Trauma Outcomes & Performance Improvement Course)*

This newer program designed by the Society of Trauma Nurses is oriented to all members of the trauma system team who participate in the ongoing assessment, evaluation and improvement of trauma care.

##### *Other*

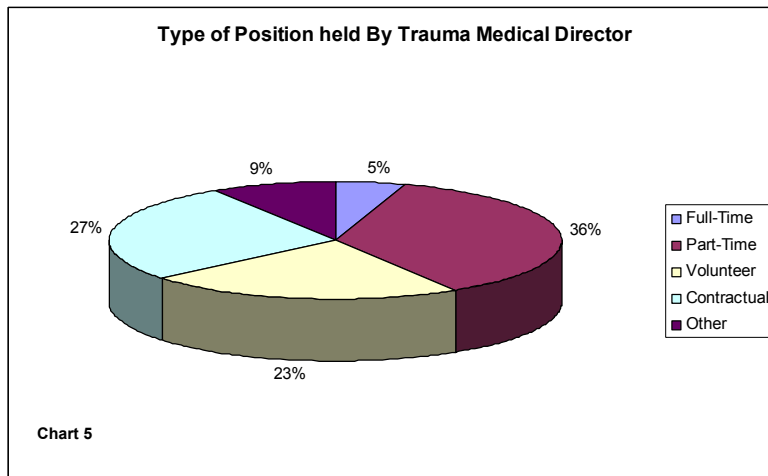
There are many other courses and pediatric and geriatric variants of other existing programs.

## 5. Trauma Medical Direction and Programmatic Integration

Two additional elements of the comprehensiveness of the trauma program are the presence of physician medical direction and the active involvement with programs such as public information and education and injury prevention efforts.

### A. Trauma Medical Direction

State Physician Medical Directors are an important trauma system component. The State Trauma Medical Director provides oversight of the medical aspects of leadership, coordination, evaluation, system quality management, and research in order to assure the best possible patient outcomes.



Of the 45 respondents, less than half (49 percent) indicated they have a state trauma medical director. Chart 5 at left shows the breakdown of each of these positions in terms of whether they are full-time, part-time, volunteer, contractual or other.

Only one state indicated the position is full-time. The preponderance of the positions is described as either part-time or contractual.

The American College of Surgeons Committee on Trauma (ACS/COT) has indisputably served in a leadership role in the advancement of trauma care and the development of trauma care systems. Each state chapter has an ACS/COT Chair who has been an important resource even for states that may not have a designated trauma medical director.

The ACS/COT chair leads the state trauma advisory committee in 10 states, serves on the advisory committee in 16 states, serves as the trauma medical director in three states, and serves in another capacity in 14 states.

Among the 22 states that *do* have a trauma medical director, the ACS/COT chair leads the state trauma advisory committee in six states, serves on the advisory committee in nine states, actually serves as the trauma medical director in three states, and serves in another capacity in seven states.

In the 23 states that *do not* have a trauma medical director, ACS/COT chair leads the state trauma advisory committee in 10 states, serves on the advisory committee in seven states, and serves in another capacity in seven states.

This information suggests that even in states that do not have a formally established trauma medical director position, the expertise requisite for the position is frequently recognized and accessed.

## B. Programmatic Integration with Injury Prevention and Public Information and Education

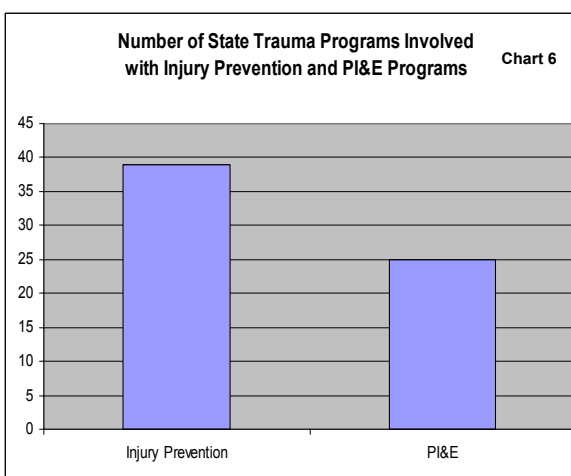
It has long been recognized that reducing the prevalence and severity of injury as a cause of death and disability goes beyond optimal care and must include greater public awareness and injury prevention strategies. In many cases, programs that address these issues are organizationally and functionally separate from the State Trauma Program. Collaboration and cooperation between the trauma system and these programs is essential to maximizing programmatic impact.

### B-I Trauma Program Involvement with Injury Prevention Programs

The state trauma program is involved in injury prevention efforts in 39 states (87 percent). The nature and extent of involvement varies widely between states, but may involve regular cooperative meetings, joint planning efforts, data sharing, grant proposal collaboration, and programmatic project cooperation.

### B-II Trauma Program Involvement with PI&E Programs

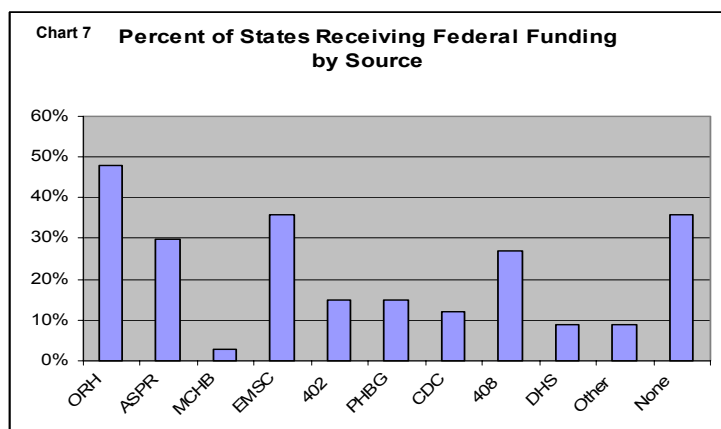
The trauma program is involved in public information and education efforts related to trauma and injury prevention in 25 states (56 percent). The nature and extent of involvement varies widely among states, but may involve providing data to support education efforts, website support, and presentations and conference participation.



## 6. Federal Funding Resources

Most state trauma programs are organizationally situated within the state EMS office. The NASEMSO 2005 monograph, “The Organization, Staffing and Function of State and Territorial EMS Offices” finds that about 70% of state EMS offices have definitive authority in trauma center designation and 40% have definitive authority in injury prevention.

The revenue sources for state EMS programs can be broken down into three broad sources: state



general revenues, state special funds, and federal funds. According to a 2009 study completed by the NASEMSO, funding from all three of these sources appears to be in a persistent decline.

Federal funding is accessed from at least one source by 33 of the 45 (73 percent) state trauma programs in the survey. Thirty-six percent of states in the survey receive no federal monies

from any source. The instrument inquired about nine specific programmatic sources and one additional category of federal funding, “other.” The highest number of different federal agencies reported to be accessed for funding is seven and the average number of agencies accessed by trauma programs is two. Chart 7 shows the percent of states receiving federal funding from each program source.

## **7. Trauma Registry, Data Analysis and Performance Improvement**

All programs generally do three things: formulate policy; implement policy; and evaluate policy. The capacity for determining a program’s effectiveness in meeting its mission is reliant on solid data and evaluation. Data can be used to establish performance benchmarks, identify areas that require additional attention or resources, discard policies or approaches that do not work or to formulate new policies.

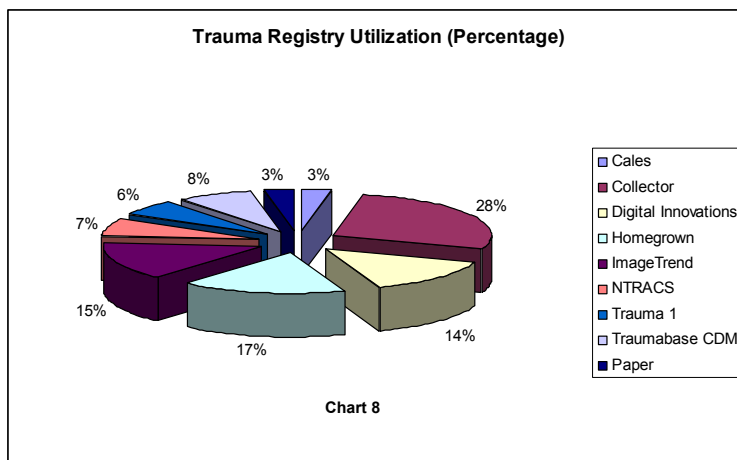
The trauma registry is a data collection platform. Data analysis is the means by which the information collected within the platform is studied. Performance improvement is the data-driven strategic approach to refinement and improvement of the system.

### **A. Trauma Registries**

The trauma registry is a repository of information (usually computerized) about the treatment, diagnosis and outcomes of trauma patients. The input instrument is usually a data form that contains prescribed fields allowing the input of standardized types of information about seriously injured patients. The crux of the registry though is the data definitions, inclusion criteria, and reporting requirements.

Data definitions refer to specific information about the type or range of information that must be entered in a given field. Inclusion criteria define the types of injured patients about whom data collection is required. Reporting requirements express which EMS or medical care providers or institutions are required or are eligible to participate, and how often the information must be provided to the state registry.

A state trauma registry is in place in 38 (85 percent) of the states responding to the survey. Of these 38 states, 31 (82 percent) indicate participation in the trauma registry is mandatory.



Ten states (26 percent) require all acute care hospitals to provide trauma registry data. Only trauma centers are required to provide trauma registry information in 21 states (55 percent). Five states (13 percent) require other kinds of facilities or entities to provide trauma registry information.

With the exception of one state that is still using paper forms, and one state in which the respondent did not know what software is used for the

state trauma registry, all other trauma registries (36) are computerized. The software platforms in use are either unique and individually-developed or commercial proprietary systems.

Six (17 percent) of the 36 states using computerized registry platforms utilize unique individually developed software. Of the remaining 30 states (83 percent), all use proprietary commercial software systems. Of these thirty states, 10 use Collector; Five use Digital Innovations; Five use ImageTrend; Three use TraumaBase CDM; Two use NTRACS; one uses Cales; and one uses both NTRACS and ImageTrend.

Of the thirty-six states using computerized registry platforms, 12 (33 percent) integrate trauma registry information with the prehospital data system. This integration provides a better perspective of the continuum of care.

Trauma data are reported to the National Trauma Data Bank by 33 (92 percent) of the thirty-six states with computerized trauma registries.

### **B. Trauma Data Analysis**

Data analysis is the process of aggregating, verifying, comparing and contrasting information for both descriptive and predictive purposes to identify trends or to validate or evaluate a system. Data analysis can be performed in-house by state staff, provided as an additional service by the software vendor, outsourced through a contractual arrangement, or other arrangements can be made for analytical services. In a few instances more than one medium is used, perhaps for different types of analyses.

Data analysis is performed by state staff in 31 (82 percent) of the 38 states with any kind of trauma registry. Five states (16 percent) indicate some analyses are performed by a contractor, and eight (26 percent) report analyses are done by other means. None of the states reported using the software vendor for data analysis.

Special reports using trauma data are often developed for various target audiences to improve awareness of the trauma system. Special reports are produced for participating hospitals in 27 states; special reports for the legislature are produced in 20 states; reports for EMS are produced in 20 states; reports for the general public are produced in 17 states; and special reports for other target audiences are produced in 15 states.

### **C. Trauma Performance Improvement**

The value of aggregating and analyzing information is largely dependent on how the information is used. Performance improvement is the use of properly analyzed data to evaluate processes and improve trauma patient outcomes.

Performance can be measured in several different ways. In general, when evaluating the performance of a trauma care system, considerations relate to: *efficiency* parameters that capture how quickly the prescribed procedures are done; and *effectiveness* parameters that capture the outcomes. Performance measures can be devised for each link in the chain of care if the pertinent data are available to support assessment.

Performance measures for trauma centers exist in 17 states (38 percent). Performance measures for EMS are in place in 14 states (31 percent). Performance measures for the statewide trauma system are in place in 16 states (36 percent). Five states have regional performance measures. One state has performance measures that also apply to non-trauma hospitals. Seven states have other types of performance measure standards. Most of these states have performance measures

at more than one level. However, 14 (37 percent) of the 38 states with a state trauma registry do not have performance standards at any level.

Of the 45 states responding to the survey, 16 (36 percent) have a state performance improvement plan or guide and 29 (64 percent) do not. (See chart at left)

***Appendix***

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**2009 NASEMSO Trauma System Planning and Evaluation Survey Instrument**

**List of States Participating in 2009 Survey**



# NASEMSO Survey: Status of State Trauma System Planning and Evaluation

<b>A. Demographic Information</b>		
1. Name of State/Territory	2. Name of Person Completing Survey	3. Title of Person Completing Survey
4. Phone Number	5. Fax	6. E-mail address
<b>B. Trauma Centers</b>		
1. What levels of trauma center does your state recognize? <input type="checkbox"/> Level I <input type="checkbox"/> Level II <input type="checkbox"/> Level III <input type="checkbox"/> Level IV <input type="checkbox"/> Level V <input type="checkbox"/> None		
2. How many of each level of trauma center currently exist in your state? Level I -                      Level II -                      Level III -                      Level IV -                      Level V -		
3. To what extent are the criteria for your trauma centers based on the current ACS/COT criteria? <input type="checkbox"/> Completely <input type="checkbox"/> Partially <input type="checkbox"/> Other (explain:                      )		
4. Does your state conduct site visits for verification/validation/designation purposes? <input type="checkbox"/> Yes <input type="checkbox"/> No		
5. If so, what sort of team is used to conduct the site reviews? <input type="checkbox"/> ACS Team <input type="checkbox"/> State Team <input type="checkbox"/> Combination <input type="checkbox"/> Other (explain:                      )		
6. What is the period of time (in years) for which a verification/validation/designation is considered valid?		
7. Is site review required for renewal of trauma center verification/validation/designation? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other (explain:                      )		
8. Does your state charge a fee for the designation process? <input type="checkbox"/> Yes <input type="checkbox"/> No		
<b>C. Stakeholder Inclusion</b>		
1. Does your state have a statewide stakeholder group (e.g., advisory committee) with a special interest in trauma system policy? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2. If so, is this group formal (mandated by rule or legislation) or does it exist informally? <input type="checkbox"/> Formal <input type="checkbox"/> Informal		
3. Does your state have regional stakeholder groups (e.g., advisory committees) with a special interest in trauma system policy? <input type="checkbox"/> Yes <input type="checkbox"/> No		
4. If so, are these groups formal (mandated by rule or legislation) or do they exist informally? <input type="checkbox"/> Formal <input type="checkbox"/> Informal		
<b>D. Trauma Staff</b>		
1. What is the number of staff (FTE) positions assigned to the state trauma program?		
2. Of these FTEs, how many work in: facility designation                      , trauma registry                      , system development                      , trauma system quality improvement                      , Other		
<b>E. State Trauma Plan</b>		
1. Does your state have a state trauma plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2. If there is a plan or one under development, and if applicable, under what national guidelines was this plan developed? <input type="checkbox"/> The "Model Trauma System Planning and Evaluation" document <input type="checkbox"/> Earlier HRSA guidelines <input type="checkbox"/> Other Guidelines (Specify:                      ) <input type="checkbox"/> Not applicable		
3. If the "Model Trauma System Planning and Evaluation" document was used, has your state completed the BIS assessment? <input type="checkbox"/> Yes <input type="checkbox"/> No		
4. If so, was the BIS assessment used to develop your state trauma plan? <input type="checkbox"/> Yes <input type="checkbox"/> No		

<b>F. State Trauma Registry</b>		
1. Does your state have a state trauma registry? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2. If so, is participation: <input type="checkbox"/> mandatory or <input type="checkbox"/> voluntary?		
3. If mandatory, who is required to submit data? <input type="checkbox"/> All acute care hospitals <input type="checkbox"/> Trauma centers only <input type="checkbox"/> Other If "other," explain:		
4. What software is used for the trauma registry at the state level?		
5. Is your trauma registry vendor participating with the NTDS/NTDB? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Unknown		
<b>G. Trauma Registry Data Analysis</b>		
1. Who performs data analysis of your state trauma registry? <input type="checkbox"/> State staff <input type="checkbox"/> Software Vendor <input type="checkbox"/> Contractor <input type="checkbox"/> Other (explain: _____)		
2. Are any special reports generated using trauma registry data for any of the following target audiences? <input type="checkbox"/> Participating hospitals <input type="checkbox"/> Legislature <input type="checkbox"/> EMS <input type="checkbox"/> General Public <input type="checkbox"/> Other (explain: _____)		
3. Is trauma registry information integrated with prehospital data reporting? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other (explain: _____)		
<b>H. Trauma Professional Education</b>		
1. Does your state require completion of any of the following programs for professionals practicing in the trauma care field? <input type="checkbox"/> ATLS <input type="checkbox"/> TNCC <input type="checkbox"/> PHTLS <input type="checkbox"/> RTTDC <input type="checkbox"/> TOPIC <input type="checkbox"/> Other (explain: _____)		
2. If so, does the state provide any financial support for these programs? <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Other (explain: _____)		
<b>I. State Trauma Medical Director</b>		
1. Does your state have a state trauma medical director? <input type="checkbox"/> Yes <input type="checkbox"/> No		
2. If yes, in what capacity does that person serve? <input type="checkbox"/> Full time <input type="checkbox"/> Part time <input type="checkbox"/> Volunteer <input type="checkbox"/> Contractual <input type="checkbox"/> Other (explain: _____)		
3. Which best describes the role of your state's ACS/COT chair in your trauma system? <input type="checkbox"/> Chairs state advisory group <input type="checkbox"/> Serves on state advisory group <input type="checkbox"/> Serves as state trauma medical director <input type="checkbox"/> Other (explain: _____)		
<b>J. Protocols</b>		
1. Are the CDC/ACS Field Trauma Triage Guidelines in use in your state?		
<input type="checkbox"/> Yes, without modification	<input type="checkbox"/> Yes, with modifications	<input type="checkbox"/> No, not at all
2. Please indicate the level of control for written protocols or guidelines required for treatment, triage, transport and tracking of trauma patients (for each item, check all that apply)		
Trauma patient treatment		
<input type="checkbox"/> None	<input type="checkbox"/> Local	<input type="checkbox"/> Regional <input type="checkbox"/> Statewide
Trauma patient triage		
<input type="checkbox"/> None	<input type="checkbox"/> Local	<input type="checkbox"/> Regional <input type="checkbox"/> Statewide
Trauma patient transfer		
<input type="checkbox"/> None	<input type="checkbox"/> Local	<input type="checkbox"/> Regional <input type="checkbox"/> Statewide
Trauma patient tracking		
<input type="checkbox"/> None	<input type="checkbox"/> Local	<input type="checkbox"/> Regional <input type="checkbox"/> Statewide

<b>K. Injury Prevention</b>
1. Is the state trauma program involved in injury prevention efforts? <input type="checkbox"/> Yes <input type="checkbox"/> No
2. If yes, please describe the types of programs:
<b>L. Public Information and Education</b>
1. Is the state trauma program involved in public information and education efforts related to trauma and injury prevention? <input type="checkbox"/> Yes <input type="checkbox"/> No
2. If yes, please describe:
<b>M. Preparedness</b>
1. Does the state trauma program have an identified role in the state disaster response plan? <input type="checkbox"/> Yes <input type="checkbox"/> No
2. Does the state trauma program have an MCI plan? <input type="checkbox"/> Yes <input type="checkbox"/> No
3. Is a uniform disaster triage guideline used in your state? <input type="checkbox"/> Yes <input type="checkbox"/> No
4. If so, which guidelines are used? <input type="checkbox"/> START <input type="checkbox"/> SALT <input type="checkbox"/> Other (specify: _____ )
<b>N. Rehabilitation</b>
1. On which of the following is injury rehabilitation expertise represented in your state? <input type="checkbox"/> State advisory committee <input type="checkbox"/> Regional committees <input type="checkbox"/> State trauma data <input type="checkbox"/> Performance improvement <input type="checkbox"/> Education <input type="checkbox"/> Injury prevention <input type="checkbox"/> Public awareness <input type="checkbox"/> None
<b>O. Finance</b>
1. For the current federal fiscal year (October 1, 2008 – September 1, 2009) from which federal sources is your trauma program receiving grant support? <input type="checkbox"/> Office of Rural Health <input type="checkbox"/> ASPR <input type="checkbox"/> Maternal and Child Health <input type="checkbox"/> EMSC <input type="checkbox"/> Highway Safety 402 <input type="checkbox"/> Preventive Health Block Grant <input type="checkbox"/> CDC <input type="checkbox"/> Highway Safety 408 <input type="checkbox"/> DHS <input type="checkbox"/> None <input type="checkbox"/> Other (specify: _____ )
<b>P. Performance Improvement</b>
1. Does your state have performance measures for: (check all that apply) <input type="checkbox"/> Trauma Centers <input type="checkbox"/> EMS <input type="checkbox"/> Non-Designated Hospitals <input type="checkbox"/> Regional Trauma Systems <input type="checkbox"/> Statewide Trauma System <input type="checkbox"/> None <input type="checkbox"/> Other (specify: _____ )
2. Does your state have a state performance improvement plan or guide? <input type="checkbox"/> Yes <input type="checkbox"/> No If so, please list the website address where applicable descriptions of the plan or guide may be viewed or downloaded:
<b>Q. Comments/Clarifications</b>
1. If you have comments or wish to clarify any answers given above, please insert your comments here:

## List of States Participating in 2009 Survey

State
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Alabama
Alaska
Arizona
California
Colorado
Connecticut
Delaware
Florida
Georgia
Idaho
Illinois
Indiana
Iowa
Kansas
Kentucky
Louisiana
Maine
Maryland
Michigan
Minnesota
Missouri
Montana
Nebraska
Nevada
New Hampshire
New Jersey
New Mexico
New York
North Carolina
North Dakota
Ohio
Oklahoma
Oregon
Pennsylvania
Rhode Island
South Carolina
South Dakota
Tennessee
Utah
Vermont
Virginia
Washington
West Virginia
Wisconsin
Wyoming