Status of State Trauma System Planning and Development

Utilization Of The HRSA Model Trauma System Planning And Evaluation Document

September 2016

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I. Executive Summary

Injury Deaths Compared to Other Leading Causes of Death for Persons Ages 1–44, United States, 2013

Source: Centers for Disease Control and Prevention, Web-based Injury Statistics Query and Reporting System[1]

"The neglected disease of modern society."

Injuries, including all causes of unintentional and violence-related injuries combined, account for 59% of all deaths among people ages 1-44 years of age in the U.S.—that is more deaths than non-communicable diseases and infectious diseases combined. Injuries killed more than 199,800 in 2014—one person every three minutes, according to the Centers for Disease Control and Prevention (CDC). In addition, 2.5 million people were hospitalized and 26.9 million people were treated in emergency departments for injuries in 2014. Injury and violence also has an alarming economic toll. The total costs of injuries and violence in the United States was $671 billion in 2013. The costs associated with fatal injuries were $214 billion while nonfatal injuries accounted for over $457 billion[1].
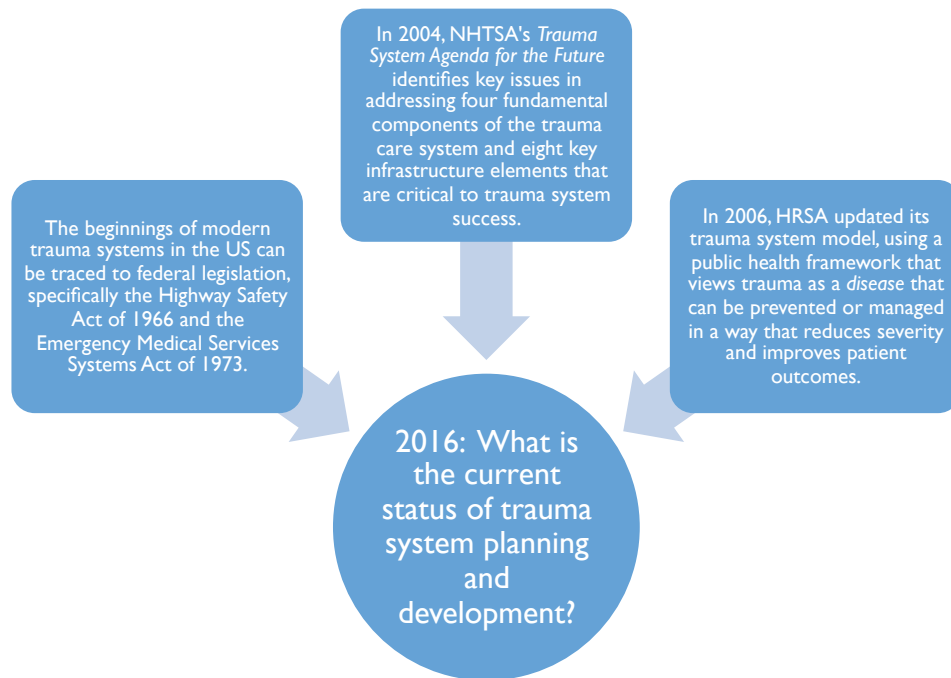
In 1966, the National Academy of Science National Research Council Committees on Trauma and Shock published "Accidental Death and Disability: The Neglected Disease of Modern Society," a report that influenced the development of modern emergency medical services (EMS) and trauma systems. In 2004, the National Highway Traffic Safety Administration (NHTSA) noted, "A trauma system is an organized, coordinated effort in a defined geographic area that delivers the full range of care to all injured patients and is integrated with the local public health system. The true value of a trauma system is derived from the seamless transition between each phase of care, integrating existing resources to achieve improved patient outcomes. Success of a trauma system is largely determined by the degree to which it is supported by public policy." The Health Resources and Services Administration (HRSA) presented the HRSA Model Trauma Systems Planning and Evaluation (MTSPE) in 2006 and while the federal Trauma-EMS System Program was largely defunded shortly thereafter, the Model continues to serve as a foundation/guide for states in assessment with strategic planning and tactical planning with implementation.

In an effective system, trauma care delivery is organized through the entire spectrum of care delivery from injury prevention to pre-hospital care, care at all acute care facilities and trauma centers, and rehabilitation. The system begins with a State's authority to designate various levels of trauma and burn centers so that through data collection and analysis processes, the system demonstrates its own effectiveness. NASEMSO supports the concept of an inclusive trauma care system, meaning that every acute care hospital routinely provides services to traumatically injured persons and is thus included in the trauma system. True trauma system integration means that no matter where in the United States trauma occurs, the patient is assured expeditious transport to the level of care that is commensurate with their injury.

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[1] Centers for Disease Control and Prevention (CDC). Key Injury and Violence Data accessed August 31, 2016 at http://www.cdc.gov/injury/wisqars/overview/key_data.html

The beginnings of modern trauma systems in the US can be traced to federal legislation, specifically the Highway Safety Act of 1966 and the Emergency Medical Services Systems Act of 1973.

In 2004, NHTSA's *Trauma System Agenda for the Future* identifies key issues in addressing four fundamental components of the trauma care system and eight key infrastructure elements that are critical to trauma system success.

In 2006, HRSA updated its trauma system model, using a public health framework that views trauma as a *disease* that can be prevented or managed in a way that reduces severity and improves patient outcomes.

2016: What is the current status of trauma system planning and development?

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 HRSA and NHTSA. To the extent possible, we will compare our results with data collected in 2010. In understanding the findings, there are two main caveats:

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, data analysis, and disaster preparedness 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 assessment tool was designed to elicit information that would be useful in achieving an understanding of the general status of these systems. Related questions have been integrated at the beginning of each section throughout the document. 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. Results of the assessment are summarized in the sections below. The use of thumbnail graphics is used to conserve space within this document. A viewable set of the images can be obtained at http://nasemso.org/Resources/Monographs/.

The assessment population consisted of trauma system managers or the state EMS director. Data was collected in May 2015. Of the potential pool of 50 states, 41 full or partial responses were collected for an overall return rate of eighty two percent. NASEMSO expresses deep appreciation for all those who responded: Alabama, Alaska, Arizona, Arkansas, California, Colorado, Delaware, Florida, Georgia, Idaho, Illinois, Indiana, Iowa, Kansas, Kentucky, Louisiana, Maryland, Michigan, Minnesota, Montana, Nebraska, Nevada, New Hampshire, New Mexico, New York, North Carolina, North

Dakota, Ohio, Oklahoma, Oregon, Pennsylvania, Rhode Island, South Carolina, South Dakota, Tennessee, Texas, Utah, Virginia, Washington, West Virginia, and Wyoming.

NASEMSO sincerely thanks the American Trauma Society for technical assistance in the preparation of this report.

Finally, the collection, analysis, and presentation of state data would not have been possible without the support of the U.S. Department of Transportation National Highway Traffic Safety Administration, Office of Emergency Medical Services. We are grateful for their ongoing commitment to support statewide trauma systems and quality trauma care across the Nation.

II. State Trauma Programs

"The concept of inclusive trauma care systems promotes regionalization of trauma care, so that all areas of the country receive the best possible care."

Source: NHTSA Trauma System Agenda for the Future (2004)

This section addresses the findings from the following assessment questions. Click <u>HERE</u> to skip questions and go to narrative.

Q7 Where is your office "administratively" located?
- State Health Department
- Other state agency
- Outside entity (such as state hospital association, foundation, etc)

Q8 What is your level of accountability to your state's bureau or office of EMS (please check best answer)?
- Our functions are located within the state EMS office
- We work collaboratively with the EMS office but do not administratively report to them
- We are totally separate from the EMS office and interface with multiple state agencies
- If "Other" please explain

Q9 What is the number of staff (FTE) positions assigned to the state trauma program? (Numerical data only, if none, use 0)
- Total
- Administrative/management (including Director)
- Medical director dedicated to the trauma program
- Medical director with shared responsibilities to Office of EMS
- General program staff (excluding admin/IP/data)
- Facility designation
- Data/Registry
- Quality Improvement
- Epidemiologist
- Injury Prevention
- Public Information
- Multiple responsibilities

Q10 What "time sensitive" systems are coordinated by your state?
- Trauma (adult and pediatric trauma including burns)
- STEMI
- Stroke
- Other

Q11 Is the state trauma program involved in injury prevention efforts (i.e. falls, motor vehicle safety, "Toward Zero Deaths", etc)?
- Yes
- No

Q12 Is the state trauma program involved in public information and education efforts besides injury prevention? (Such as educating the public on why trauma centers are important, injury/fatality rates, prevalent injury patterns in the state, survivor resources, comparison of outcomes data trauma center vs. non-designated, etc.)
- Yes
- No
- If yes, please describe:

Q13 Does the state trauma program have an identified role in the state disaster response plan?
- Yes
- No

Q14 Does the state trauma program have a Mass Casualty Incident plan?
- Yes
- No

Q15 What uniform disaster triage guideline is used in your state?
- START
- SALT
- We do not have a uniform disaster triage guideline used in our state
- If Other (please describe)

Q18 For the current federal fiscal year, (October 1, 2014-September 30, 2015) from which federal sources is your trauma program receiving grant support?
- Office of Rural Health
- Maternal and Child
- Highway Safety 402
- Highway Safety 408
- CDC
- DHS
- ASPR
- EMSC
- Preventive Health Block Grant
- None
- If Other (please specify)

Q19 For what purposes does your state trauma program use social media (i.e. Facebook, Twitter, Instagram, etc)?
- Highlight accomplishments
- Communicate with stakeholders and/or the public
- Trauma prevention messaging
- Promote educational opportunities
- Our state trauma program doesn't use social media
- Other

Q20 Does your state have legislative authority (enabling legislation and rules) to designate trauma centers?
- Yes
- No

Q22 Does your state have the legislative authority to limit the number of trauma centers?
- Yes
- No

Q34 Does your state have a state trauma plan? (Please choose best answer)
- Yes, we have a standalone state trauma plan
- Yes, trauma is part of the state EMS (or similar) plan
- We are in the process of developing a state trauma plan
- No, we do not have a state trauma plan

Q35 If your state has a state trauma plan or is developing one, under what national guidelines was this plan developed?
- The "Model Trauma System Planning and Evaluation" document (HRSA, 2006)
- Regional Trauma Systems: Optimal Elements, integration, and Assessment guidance document (ACS-COT, 2008)
- Our state does not have a state trauma plan nor are we developing one
- If "Other guidelines" (please specify the source)

Q36 If the "Model Trauma System Planning and Evaluation" (MTSPE) document was used, has your state completed the Benchmarks, Indicators, and Scoring (BIS) assessment?
- Yes
- No
- MTSPE does not apply to our state

Q37 Does your state have a STATEWIDE stakeholder group (i.e. Board or advisory committee) with a special interest in trauma system policy?
- Yes, it is mandated by rule or legislation
- Yes, such a group exists informally/voluntarily (i.e hospital association or other entity coordinates activities)
- No, our state does not have a statewide stakeholder group for trauma

Q38 Does your state have a REGIONAL stakeholder group (i.e. Board or advisory committee) with a special interest in trauma system policy?
- Yes, it is mandated by rule or legislation
- Yes, such a group exists informally/voluntarily
- No, our state does not have a regional stakeholder group for trauma
- Q39 On which of the following groups is injury rehabilitation expertise represented in your state?
- Trauma Advisory Committee
- Trauma Data/Trauma Registry Committee
- Performance Improvement Committee
- Education Committee (for trauma professionals and staff)
- Injury Prevention Committee
- Public Education Committee
- None of the above

1. State Trauma Program Organization and Authority

States assumed a primary role in trauma systems development following the release of federal guidance documents in 2004 and 2006. Over the next several years, federal support and funding for trauma systems development dwindled and responsibility for trauma system integration largely shifted to the states. In 2015, State Health Departments were recognized as the administrative "home" for eighty percent (Fig. 1, 2) of state trauma programs although fifteen percent reported administrative support from another state agency, and four percent were located in a non-governmental entity such as a state hospital association or foundation. In the same period, the average number of full time equivalent (FTE) state trauma program staff was 5, inclusive of an administrative lead, general program staff, facility designation, data/registries, an epidemiologist, and persons that fulfill multiple job functions (Fig. 3). This is a fifty-nine and one half percent increase in full time equivalent staff from 2010. 36 states (ninety percent of respondents) have legislative authority (enabling legislation and rules) to designate trauma centers (Fig. 4.) Only 8 states currently report the legislative authority to limit the number or location of trauma centers (Fig. 5.)
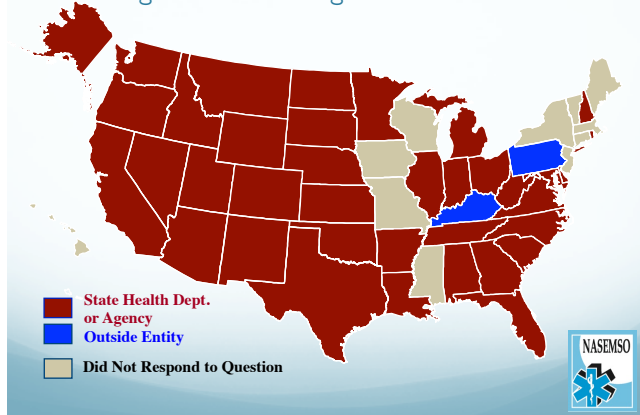

Fig. 1 Trauma Program Administration

State Health Dept. or Agency
Outside Entity
Did Not Respond to Question

Fig. 2 Trauma Program Location/ Accountability to State EMS Office

Located in EMSO
Work collaboratively
Totally separate from EMS
Did Not Respond to Question
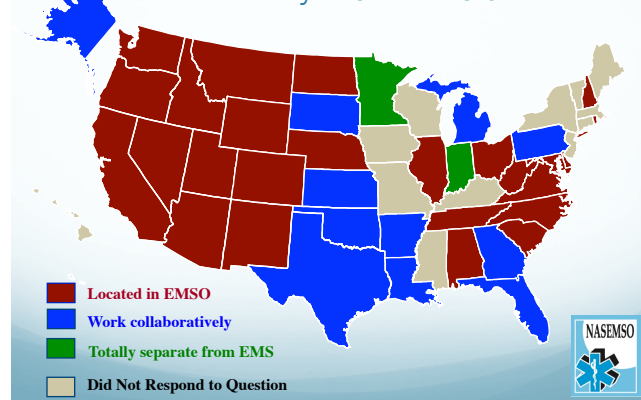
Fig. 3 Average Number of Personnel by Category

Distribution of Personnel

	Total staff	Administrative	Dedicated Med Dir	Shared Med Dir	Miscellaneous	Facility Designation	Data/ Registry	Performance Improvement	Epidemiologist	Injury Prevention	Public Information	Multiple Responsibilities
Average	5	1	0	0	2	3	2	0	2	0	0	2

Average Number from Total Respondents
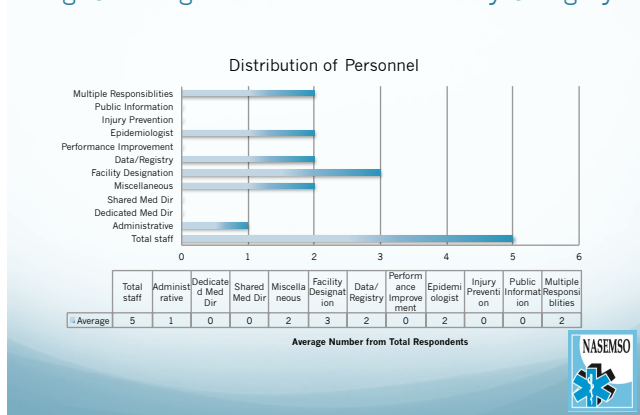
Fig. 4 State Has Enabling Legislation to Designate Trauma Centers

Yes
No
Did Not Respond to Question

Fig. 5 State Has Regulatory Authority to Limit the Number of Trauma Centers
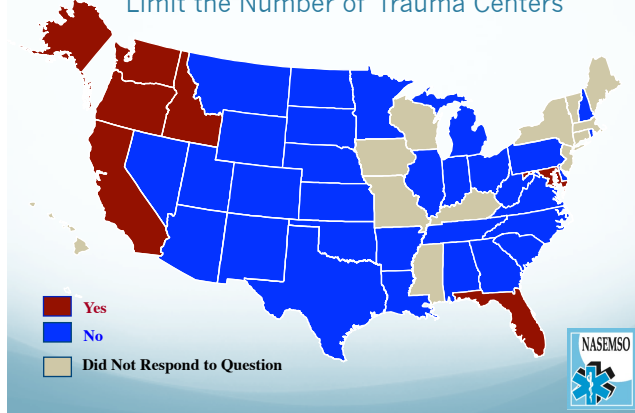
2. State Trauma Plan

Fifty percent of respondents indicate the availability of a State Trauma Plan. An additional thirteen percent of respondents report that trauma is integrated into the state EMS plan while eighteen percent report that the development of a state trauma plan is currently in progress. Eighteen percent of respondents reported not having a state trauma plan (Fig. 6.) Overall, the use of state trauma plans has increased seventeen percent since 2010. In 2015, forty two percent of respondents utilized the "Model Trauma System Planning and Evaluation" (MTSPE) and companion Benchmark Indicator and Scoring (BIS) assessment last revised by HRSA in 2006 as the basis for their state trauma plan. Twenty one percent of respondents utilized the American College of Surgeons Committee on Trauma (ACSCOT) "Regional Trauma Systems: Optimal Elements, Integration and Assessment" 2008 guidance document as the basis for the state trauma plan. Twenty nine percent of respondents reported utilized a combination or custom approach to their state trauma plan. The utilization of the MTSPE and BIS assessment in state trauma plans appear to have decreased by thirty seven percent, in part, because the tools have not been updated in 10 years. Twenty nine percent of respondents are now using a combination of documents, including plans from other states as models for state trauma planning (Fig. 7.)

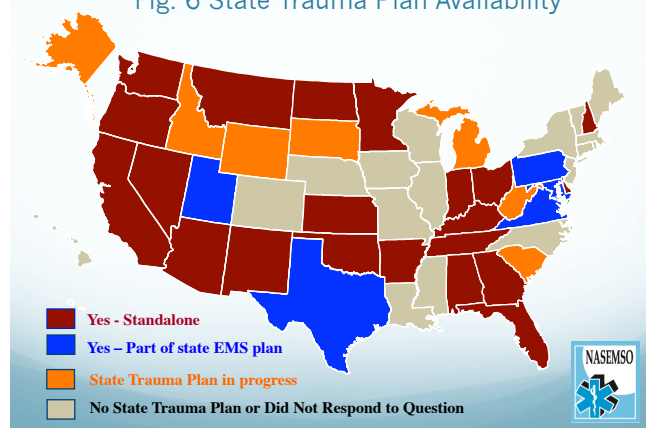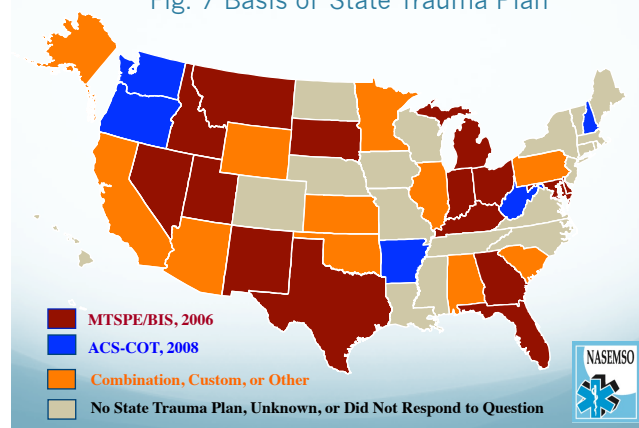Fig. 6 State Trauma Plan Availability

Fig. 7 Basis of State Trauma Plan

3. Use of Statewide and Regional Advisory Committees

Eighty-nine percent of respondents (n=34) have a statewide stakeholder group (i.e. Board or advisory committee) with a special interest in trauma system policy that is mandated by rule or legislation (Fig. 8.) Another eight percent of respondents (n=3) note this entity exists on a voluntary basis and only 1 respondent indicated this body doesn't exist in the state. The majority of statewide groups (n=15) meet on a quarterly basis, 2 meet every month, 2 meet bimonthly, 1 meets every 6 months, and 1 meets 3 times a year. Other frequencies were not specified.
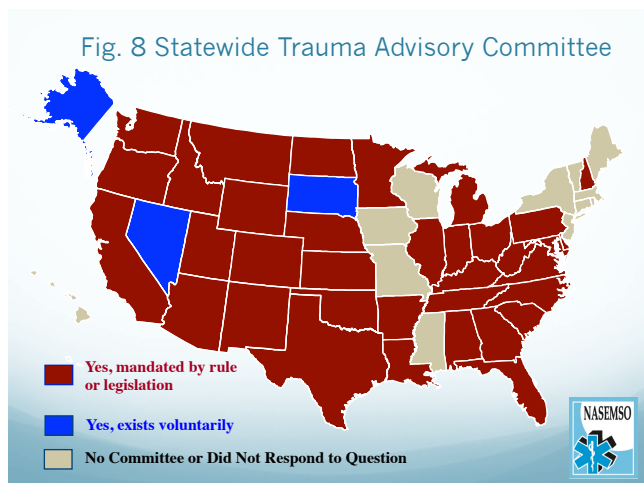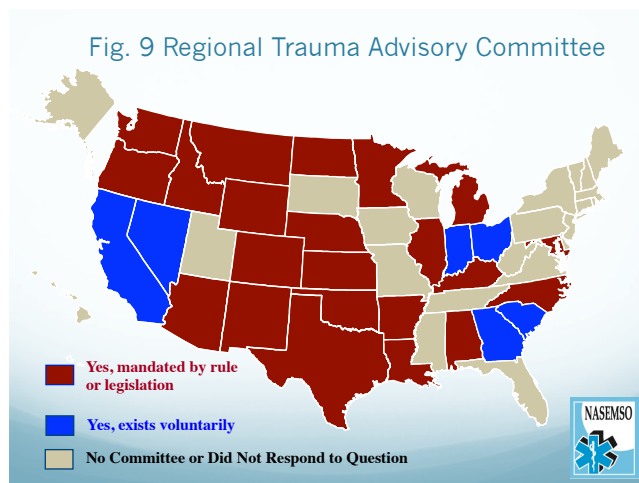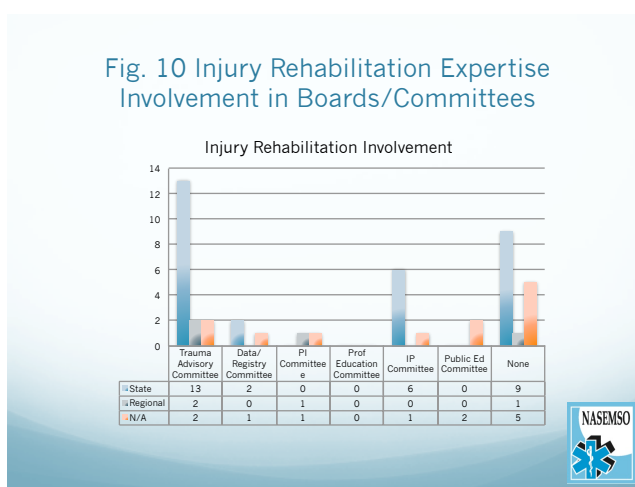

Fig. 8 Statewide Trauma Advisory Committee

- Yes, mandated by rule or legislation
- Yes, exists voluntarily
- No Committee or Did Not Respond to Question

Fig. 9 Regional Trauma Advisory Committee

- Yes, mandated by rule or legislation
- Yes, exists voluntarily
- No Committee or Did Not Respond to Question

Similarly, fifty-three percent of respondents (n=20) have a regional advisory group that is mandated by rule or legislation; another eighteen percent (n=7) report a voluntary group and twenty nine percent of respondents (n=11) do not have a regional stakeholder group for trauma (Fig. 9.) The majority of regional trauma groups meet on a quarterly basis.

Finally, the states were polled to determine the involvement of injury rehabilitation specialists serving the multiple needs of the statewide and regional panels. Findings demonstrated involvement in the areas of the State Trauma Advisory Committee and State Injury Prevention Committees (Fig. 10.)

Fig. 10 Injury Rehabilitation Expertise Involvement in Boards/Committees

Injury Rehabilitation Involvement

	Trauma Advisory Committee	Data/ Registry Committee	PI Committee	Prof Education Committee	IP Committee	Public Ed Committee	None
State	13	2	0	0	6	0	9
Regional	2	0	1	0	0	0	1
N/A	2	1	1	0	1	2	5

4. Time Sensitive Conditions

In 2006, the National Academies of Medicine (formerly the Institute of Medicine) considered emerging models of (health care) regionalization and recommended that the federal government implement a regionalized emergency care system to improve cooperation and overcome the challenges of overcrowded emergency departments (EDs) while reducing morbidity and mortality for patients with time sensitive conditions such as ST Elevation Myocardial Infarction (STEMI), stroke, and pediatric emergencies. In a regionalized system, local hospitals and EMS providers would coordinate their efforts so that patients would be brought to hospitals based on the hospitals' capacity and expertise to best meet patients' needs. The regionalization of care related to time sensitive conditions beyond trauma were not contemplated in the 2010 NASEMSO Monograph. Since that time, states have begun to coordinate system activities related to time sensitive conditions and the majority of these programs are functional as a component of the state trauma program. More states are implementing separate program offices—however, describing the organization and funding of these activities is beyond the scope of this document. (Fig. 11, 12, 13, 14.)

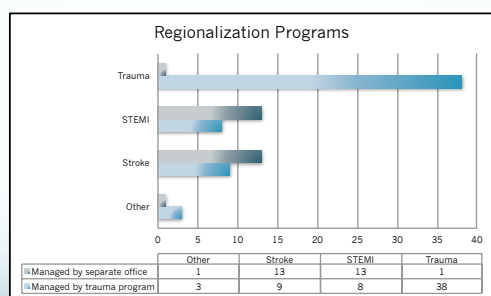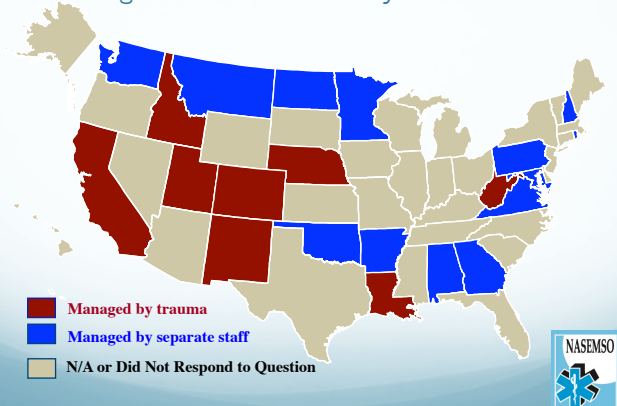Fig. 11 All Time Sensitive Conditions Managed by State

Fig. 12 Time Sensitive Systems- STEMI

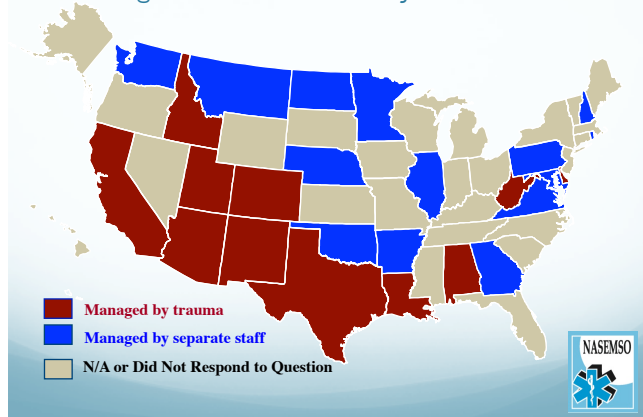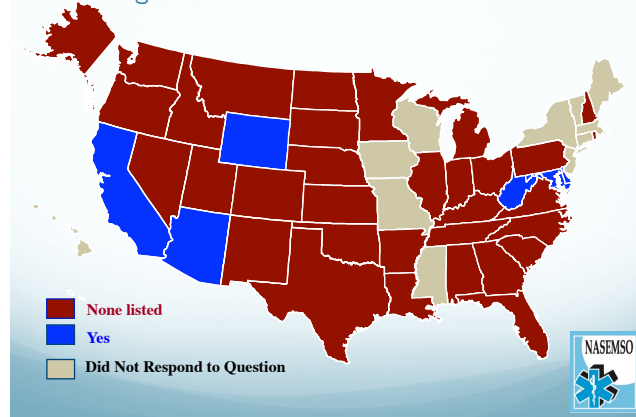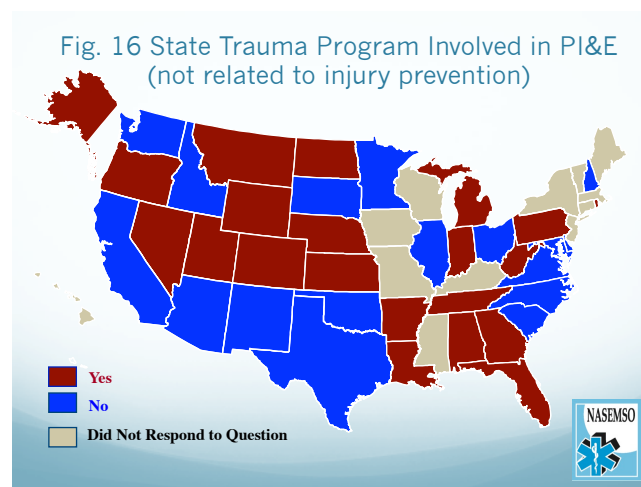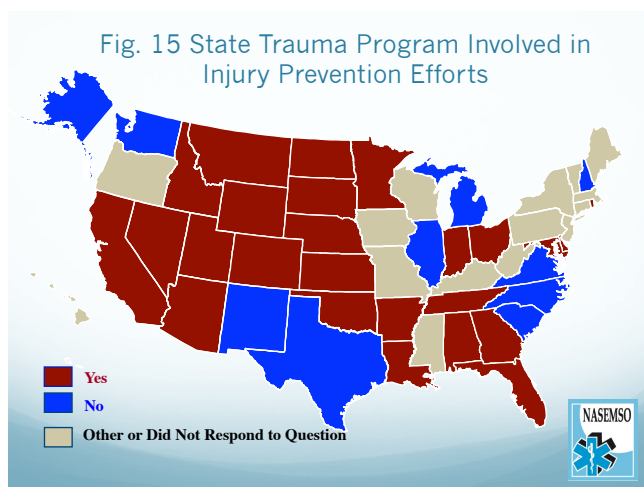Fig. 13 Time Sensitive Systems- Stroke

Fig. 14 Time Sensitive Conditions-Other

5. Injury Prevention, Public Information & Education (PI&E), and Use of Social Media

Injury prevention and public information and education is considered a related function in more than half of state responses. Sixty nine percent (n=27) report injury prevention activities related to fall prevention, motor vehicle safety, and involvement in the Toward Zero Deaths initiative (Fig. 15.) This activity is decreased by twenty percent from 2010 and comments suggest these activities are secondary functions of the trauma program and coordinated with state brain and spinal cord injury programs, violence prevention, and highway safety offices. Forty six percent of respondents (n=18) report involvement in data analysis, identification of injury and referral patterns, and conference and meeting participation that involves EMS personnel, legislators, and/or the public (Fig. 16); a ten percent decrease from the 2010 study.

Federal agencies such as the Centers for Disease Control and Prevention (CDC) have recognized the power of social media, using the broad reach of the online community to help distribute important health information. State health departments widely use social media to reach different segments of the population on a range of health topics, however, it appears this effort is not wide spread among state trauma programs as nearly eighty percent of respondents indicated they do not use social media. Those that promote messaging electronically use it to communicate with stakeholders and/or public (fifteen percent), communicate accomplishments (ten percent), promote educational opportunities (ten percent), and trauma prevention messaging (seven percent).

Fig. 15 State Trauma Program Involved in Injury Prevention Efforts

Yes
No
Other or Did Not Respond to Question

Fig. 16 State Trauma Program Involved in PI&E (not related to injury prevention)

Yes
No
Did Not Respond to Question

6. Integration with State Disaster Preparedness Planning

While trauma centers are considered an integral component and asset in large-scale disasters, a role for the state trauma program has not been clearly delineated in most state disaster response and preparedness plans. Similar to 2010, only thirty three percent of respondents (n=13) have an identified role in their state disaster response plan (Fig. 17.) It seems that elements of the trauma system (trauma centers and personnel), rather than the trauma program at the state level, play a greater role in a mass casualty response. Even fewer state trauma programs have their own Mass Casualty Incident plan, as the majority of these functions are coordinated by other state entities, such as the offices of public health preparedness and/or emergency management (Fig. 18.)

According to the Federal Interagency Committee on Emergency Medical Services (FICEMS), the Model Uniform Core Criteria (MUCC) for Mass Casualty Triage is a science and consensus-based national guideline that recommends 24 core criteria for all mass casualty triage systems. While twenty three percent of respondents indicate that a uniform disaster triage guidelines is not currently in place in their state, fifty four percent of respondents utilize "Simple Triage And Rapid Treatment" (START), five percent utilize "Sort, Access, Lifesaving Interventions, Treatment/Transport" (SALT), and

eighteen percent don't utilize a single system or are unfamiliar with the mass casualty triage system in their state (because this function is located in another office.) One state, Georgia, currently uses MUCC although several other states are reportedly pilot testing the guideline (Fig. 19.)

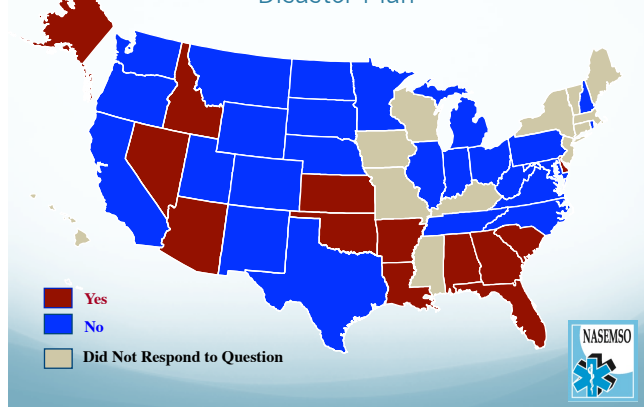Fig. 17 Trauma Program Role in Statewide Disaster Plan

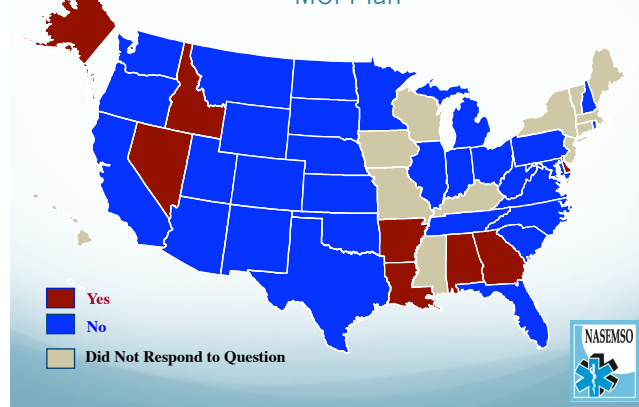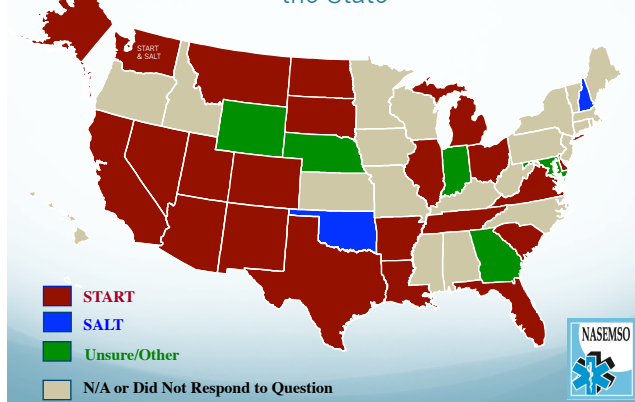Fig. 18 State Trauma Program Has Its Own MCI Plan

Fig. 19 Uniform Disaster Triage Guideline Used in the State

7.   Federal Funding/Grant Support

In the absence of federal appropriations to support trauma systems planning and development, states have struggled to implement and maintain essential systems. In 2010, thirty six percent of respondents reported they received no federal monies from any source. In 2015, thirty nine percent of respondents suffered serious decline in the level of federal funding. Figure 20 illustrates the decline of federal funding opportunities and the shift to the reliance on state-generated revenues to support trauma care. Examples include fines and fees on moving violations, fees on motor vehicle registrations, fees on license plates, fees on driver's license renewals, taxes on cigarette sales, fees from criminal penalties, and funds from general revenues although state trauma programs are competing within their own states for the distribution of these funds.

Fig. 20 Funding Sources
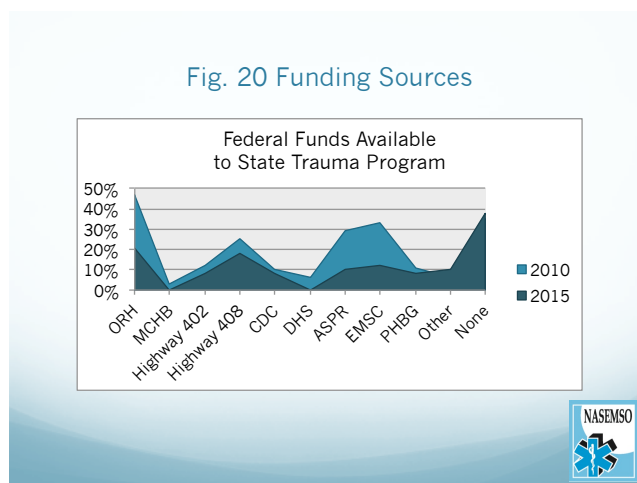
8. Key Data

- 82% of respondents (n=33) indicated their state has enabling legislation or rules to designate trauma centers.

- 23% of respondents (n=8), only 16 percent of all states, have legislative authority to limit the number of trauma centers.

- 79% of respondents (n=31) are administratively located within the state health department.

- 15% of respondents (n=6) were housed within another state agency.

- 2 respondents were located within a state hospital association or foundation.

- 64% of respondents (n=25) were located within the state EMS office.

- 31% of respondents (n=12) "work collaboratively with the state EMS office but do not administratively report there."

- 2 respondents indicated they are totally separate from the EMS office and interface with multiple state agencies.

- The average number of FTE state trauma program staff was 5, inclusive of an administrative lead, general program staff, facility designation, data/registries, an epidemiologist, and persons that fulfill multiple job functions.

- 39% of respondents (n=16) utilized the MTSPE document (HRSA, 2006) to develop their state trauma plan while 34% of respondents (n=14) have used the BIS Assessment Tool.

- 19% of respondents (n=8) utilized ACSCOT Regional Trauma Systems Guide (2008) to develop state trauma plans.

- 27% of respondents (n=11) have a "hybrid" state trauma plan developed from multiple resources.

- 17% of respondents (n=7) do not currently have a state trauma plan.

- 95% of respondents (n=39) indicate the presence of a state trauma program.

- 51% of respondents (n=21) indicate their state has a STEMI regionalization program.

- 56% of respondents (n=23) indicate their state has a stroke regionalization program.

- 9% of respondents (n=4) indicate their state manages other regionalization programs (such as pediatrics).

- 67% of respondents (n=27) indicate involvement in statewide trauma prevention activities, while 48% (n=20) are involved in public information and education activities beyond injury prevention.

- 31% of respondents (n=13) have an identified role in the state disaster response plan.

- 22% of respondents (n=9) have their own Mass Casualty Incident Plan.

- 51% of respondents (n=21) use START as the uniform disaster triage guideline used in their state.

- 5% of respondents (n=2) use SALT as the uniform disaster triage guideline used in their state.

- 23% of respondents (n=9) do not have a uniform disaster triage guideline used in their state.

- 46% of respondents (n=19) did not receive federal or outside funding for state trauma program administration.

III. Trauma Center Designation Process in the States

This section addresses the findings from the following assessment questions. Click HERE to skip questions and go to narrative.

Q21 What levels (or state nomenclature) of trauma centers does your state recognize?
- Level 1
- Level 2
- Level 3
- Level 4
- Level 5
- None

Q25 To what extent are the criteria for your trauma centers based on the current American College of Surgeons/Committee on Trauma criteria?
- Completely
- Partially
- Not at all
- Other (please explain)

Q26 How are site visits for the Trauma Center verification for designation purposes conducted in your state? (Please select BEST response)
- Our State exclusively utilizes the Verification, Review, and Consultation Program (VRC) conducted by the American College of Surgeons to support state designation of Trauma Centers
- Our State conducts its own site survey and review process of Trauma Centers in our state
- Trauma Center designation is accomplished through a partnership between the state and VRC program (state representatives participate in all reviews and site visits conducted by the VRC)
- Our State does not verify or designate Trauma Centers
- Other

Q27 If your state conducts site visits, what sort of team is used to conduct the trauma center site reviews?
- ACS Team
- State Team
- Combination of ACS/State representatives
- Our state does not conduct site visits for Trauma Centers
- Other (please explain)

Q28 What is the period of time (in years) for which an INITIAL trauma center designation is valid? (Please EXCLUDE probationary or provisional status)

- One year
- Two years
- Three years
- Four years
- Five years
- More than 5 years
- Level does not apply to our state

Q29 Is a site review required for the REVERIFICATION of designated trauma centers in your state?

- Yes
- No
- Level does not apply to our state

Q30 What other trauma related specialty centers exist in your state?

- Burn
- Hand/Microsurgery
- Neurotrauma (includes head and/or spine)
- Vascular
- Eye
- None
- Other (please specify)

Q31 If your State conducts its own review and site survey, where do your team members come from? Please choose BEST response.)

- All site survey team members are State employees.
- Our site survey team is primarily comprised of experts from out of state
- Our site survey is conducted via "peer reviewers" or experts from within the state
- Our state doesn't conduct trauma center verification site visits

Q32 Who routinely comprises your state trauma center verification team (Please check all that apply.)

- Neurosurgeon
- Trauma Surgeon
- Orthopedic Surgeon
- Anesthesiologist
- ED Physician
- Trauma Program Manager/Director
- Trauma Registrar
- State Program Representative
- Other

Q33 Who covers the logistics and travel expenses related to the verification (site survey visit) trauma center designation process in your state?

- State funds are used to cover expenses related to the designation of its Trauma Centers (such as taxes or fees)
- The hospital/facility is responsible for covering all designated related expenses
- Our state doesn't conduct Trauma Center verification surveys or site visits

1. State Designation and Standards Verification

The American Trauma Society (ATS) appropriately defines Trauma Center *designation* as a process outlined and developed at the state specific level. The state identifies unique criteria in which to categorize Trauma Centers. These categories may vary from state to state and are typically outlined through legislative or regulatory authority.

Trauma Center *verification* is an evaluation process provided by the state and/or the American College of Surgeons (ACS) to evaluate and improve trauma care.   The ACS does not designate trauma centers; instead, it verifies voluntary compliance with its standards—"Resources for Optimal Care of the Injured Patient".

Distribution of State Designated Trauma Centers in the Continental US. Source: American Trauma Society (2016)
Green- Level I
Red- Level 2
Black – Level 3
Silver- Level 4
Orange – Level 5
Blue – Pediatric Level 1 or 2

State trauma systems evolved 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 formally recognize trauma centers, and of those that do, not all recognize each level of trauma center. The concept of an inclusive trauma care systems promotes regionalization of trauma care and of the forty-one respondents, a palpable shift to greater inclusion of Levels III-V has taken place since 2010. (Fig. 21.) The criteria used to evaluate the trauma centers vary among states and even within states between levels of trauma center. The American College of Surgeons Committee on Trauma (ACSCOT) criteria for trauma centers is used exclusively by only twenty one percent (n=8) of respondents, a decrease of twenty percent since 2010. However, this shift was likely offset by a twenty five percent increase of respondents that *partially* use the ACSCOT criteria since 2010 or seventy one percent (n=27). Criteria other than ACSCOT are used by eight percent of respondents (Fig. 22.)
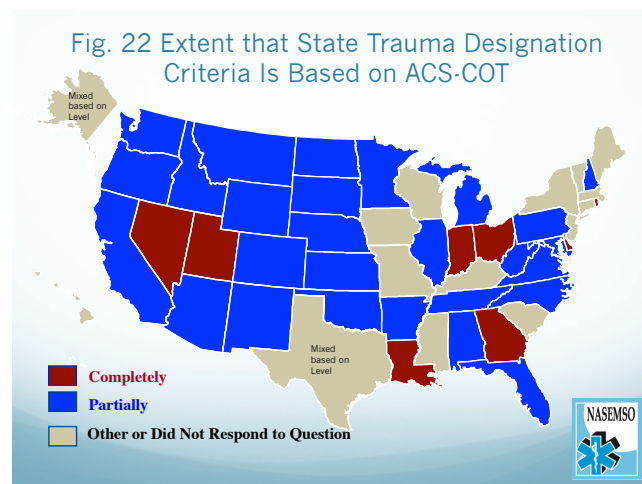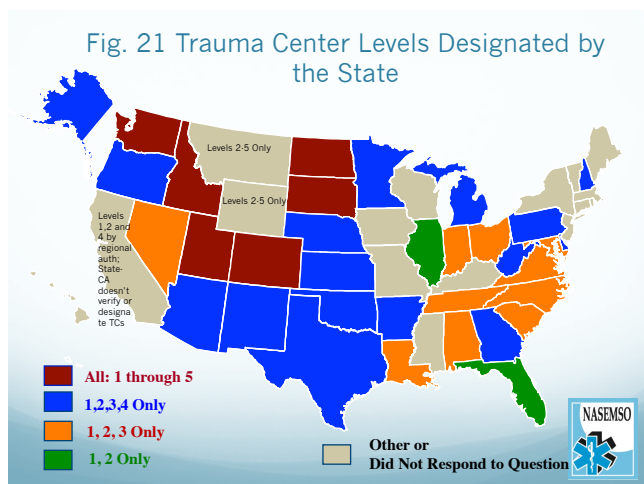

Fig. 21 Trauma Center Levels Designated by the State

Fig. 22 Extent that State Trauma Designation Criteria Is Based on ACS-COT

Fig. 23 Method of Trauma Center Verification for Designation Purposes

Legend:
- VRC Only
- State Only
- VRC req. for 1-2 or 1, 2, and 3 only; other levels by state
- Partnership VRC/State
- Other
- Did Not Respond to Question

Map labels: State doesn't verify or designate TCs; Accepts state or VRC; Rules pending; Accepts state or VRC; Rules pending

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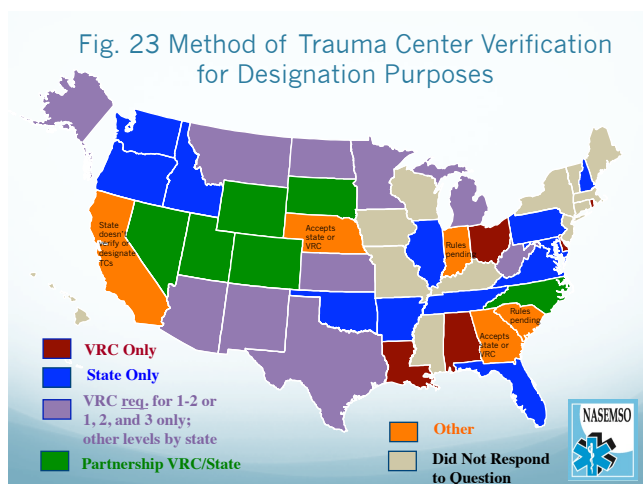
Fig. 24 Type of Site Review Team

Type of Verification Team

	ACS Team	State Team	Combination ACS/State	Do not conduct site visits	Depends on level of designation
Series1	1	22	6	3	6

NASEMSO

Fig. 25 Background of State Teams

Background of State Teams

	All are state employees	Experts out of state	Peer Reviewers in state	State doesn't conduct visits
Series1	1	11	20	6

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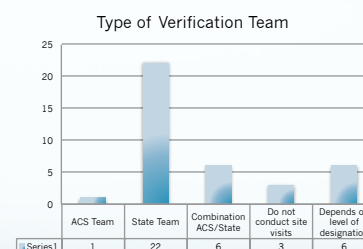
Fig. 26 Survey Team Composition

Site Survey Team Composition

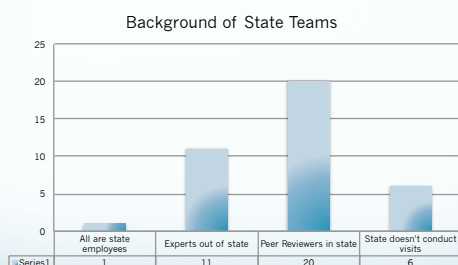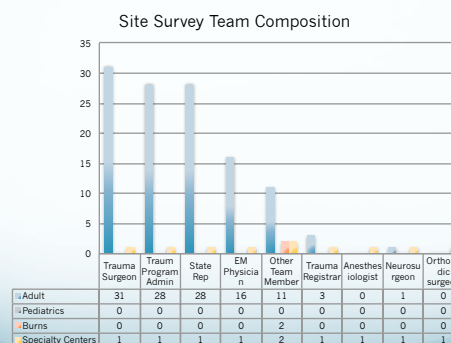|	Trauma Surgeon	Traum Program Admin	State Rep	EM Physician	Other Team Member	Trauma Registrar	Anesthesiologist	Neurosurgeon	Orthopedic surgeon
Adult	31	28	28	16	11	3	0	1	0
Pediatrics	0	0	0	0	0	0	0	0	0
Burns	0	0	0	0	2	0	0	0	0
Specialty Centers	1	1	1	1	2	1	1	1	1

NASEMSO

Site visits to verify or validate compliance with standards to recognize trauma center status appears to be a requirement of ninety percent of the respondents (n=37). Eleven percent of respondents (n=4) exclusively uses the ACSCOT Verification, Review, and Consultation (VRC) Program to support state designation of trauma centers. Thirty two percent of respondents (n=12) conduct their own site survey and review process to recognize trauma centers. Twenty one percent of respondents (n=8) accomplish designation through a partnership between the state and VRC program. Thirty four percent of respondents (n=13) use a hybrid process to designate trauma centers, for example, the VRC may be used for Level I, Level II, and on occasion, Level III Trauma Centers and the state accomplishes the designation process for levels III-V. Of the hybrid group, four respondents will accept either the VRC or state review process for recognition. One state respondent has not yet completed the rules to determine the state recognition process (Fig. 23.) Even when the state relies on the VRC for verification, the composition of the site survey team remains a partnership between the ACSCOT and the state (Fig. 24.) When state teams are used exclusively to verify compliance, the majority of respondents indicate that peer reviewers/experts from within the state are used and out-of-state participants are used to a lesser degree (Fig. 25.) An array of expert panelists participates in the surveys led most commonly by a trauma surgeon. Trauma Program Managers, a State Representative (from the state trauma program), and emergency medicine physicians round out the team. Other experts are included on a case-by-case basis (Fig. 26.) 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 mentioned by 7 states (decreased by seven percent from 2010.) The use of state review teams (at least for certain reviews) was indicated by 22 states (increase of fourteen percent from 2010.) The use of a combination of teams was indicated by 6 states (decrease of eight present from 2010); and 6 states indicated use of other types of teams or strategies for site review (no change from 2010.)

The designation periods range from one to five years, with an average mode of three years for designation (Fig. 27.) The logistics and travel expenses related to the verification (site survey visit) are borne by the state in fifty five percent of respondents (n=20). Thirty nine percent of respondents (n=14) indicate the expenses become the responsibility of the facility being assessed. (Fig. 28.) Of the 37 states that require site review for trauma center recognition ninety five percent also require re-review for renewal of the trauma center status. (Fig. 29.) While the assessment included other types of trauma related specialty centers recognized by states (such as burns and neurotrauma), the methodology involving recognition is beyond the scope of this monograph.
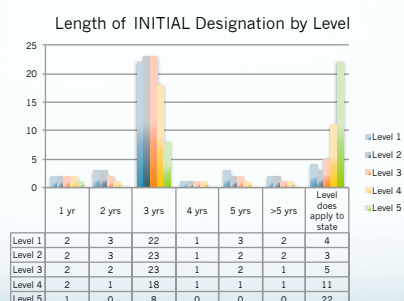

Fig. 27 Length of Initial Designation

Length of INITIAL Designation by Level

	1 yr	2 yrs	3 yrs	4 yrs	5 yrs	>5 yrs	Level does apply to state
Level 1	2	3	22	1	3	2	4
Level 2	2	3	23	1	2	2	3
Level 3	2	2	23	1	2	1	5
Level 4	2	1	18	1	1	1	11
Level 5	1	0	8	0	0	0	22

Fig. 28 Distribution of Expenses for Site Visits

Survey Expenses

State Funds   Facility   N/A

5%
39%
56%
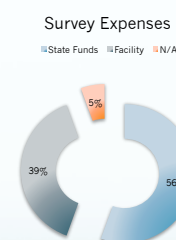
Fig. 29 Site Review Required for Reverification by State

Site Review Required for Reverification

	Level 1	Level 2	Level 3	Level 4	Level 5
Yes	34	35	32	23	8
No	1	1	2	2	0
Level does not apply to state	3	2	4	11	23
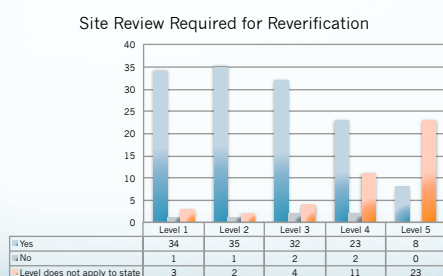
Fig. 30 Other Trauma Related Specialty Centers in the State

Other Recognized Specialty Centers in State

Other 7%
Burn 37%
None 26%
Neurotrauma 11%
Eye 5%
Vascular 5%
Hand/Microsurgery 9%
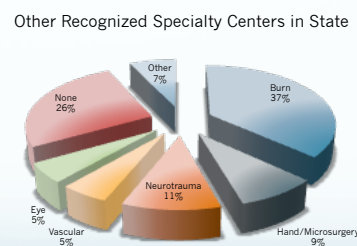
2. Key Data

- 21% of respondents (n=8) use ACS criteria/standards exclusively for state trauma center designation.

- 71% of respondents (n=25) use a combination of state and ACS criteria for trauma center designation.

- 8% of respondents (n=3) are in the process of developing/revising criteria for state trauma center designation.

- 11% of respondents (n=4) indicate their state exclusively utilizes the ACS VRC Program to support state designation of trauma centers.

- 32% of respondents (n=12) indicate their state conducts its own site survey and state-based review for trauma centers in their state.

- 20% of respondents (n=7) indicate that trauma center designation is accomplished through a partnership between the state and ACS VRC program.

- 1 respondent indicated their state does not verify or designate trauma centers.

- 34% of respondents (n=13) use the VRC for level 1-3 centers only and state processes for levels 3-5.

IV. Trauma Centers

This section addresses the findings from the following assessment questions. Click <u>HERE</u> to skip questions and go to narrative.

Q23 What is the total number of each level of ADULT Trauma Centers that currently exist in your state? (Numerical data only, if none, use 0)
- Level 1
- Level 2
- Level 3
- Level 4
- Level 5

Q24 What is the total number of each level of PEDIATRIC Trauma Centers that currently exist in your state? (Numerical data only, if none, use 0)
- Level 1
- Level 2
- Level 3
- Other (including combined adult/peds)

1. Types of Trauma Centers in an Inclusive System

Trauma Centers are referred to in terms of "levels" (ie. Level I, II, III, IV or V.) Levels refer to trauma center capacity and resources to care for patients, in other words, Level I is the highest level of capability while Level V provides the lowest capability. Facilities can also be designated/verified as adult and/or pediatric trauma centers. It is not uncommon for facilities to have different designations for each group (ie. a trauma center may be a Level I adult facility and also a Level II pediatric facility). NASEMSO concurs with the common descriptions published by the American Trauma Society to outline various criteria used in designating/verifying trauma centers illustrated below.

Level I - Level I Trauma Center is a comprehensive regional resource that is a tertiary care facility central to the trauma system. A Level I Trauma Center is capable of providing total care for every aspect of injury – from prevention through rehabilitation.

Elements of Level I Trauma Centers Include:

- 24-hour in-house coverage by general surgeons, and prompt availability of care in specialties such as orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology, internal medicine, plastic surgery, oral and maxillofacial, pediatric and critical care.
- Referral resource for communities in nearby regions.
- Provides leadership in prevention, public education to surrounding communities.
- Provides continuing education of the trauma team members.
- Incorporates a comprehensive quality assessment program.
- Operates an organized teaching and research effort to help direct new innovations in trauma care.
- Program for substance abuse screening and patient intervention.
- Meets minimum requirement for annual volume of severely injured patients.

Level II - A Level II Trauma Center is able to initiate definitive care for all injured patients.

Elements of Level II Trauma Centers Include:

- 24-hour immediate coverage by general surgeons, as well as coverage by the specialties of orthopedic surgery, neurosurgery, anesthesiology, emergency medicine, radiology and critical care.
- Tertiary care needs such as cardiac surgery, hemodialysis and microvascular surgery may be referred to a Level I Trauma Center.
- Provides trauma prevention and to continuing education programs for staff.
- Incorporates a comprehensive quality assessment program.

Level III - A Level III Trauma Center has demonstrated an ability to provide prompt assessment, resuscitation, surgery, intensive care and stabilization of injured patients and emergency operations.

Elements of Level III Trauma Centers Include:

- 24-hour immediate coverage by emergency medicine physicians and the prompt availability of general surgeons and anesthesiologists.
- Incorporates a comprehensive quality assessment program
- Has developed transfer agreements for patients requiring more comprehensive care at a Level I or Level II Trauma Center.
- Provides back-up care for rural and community hospitals.
- Offers continued education of the nursing and allied health personnel or the trauma team.
- Involved with prevention efforts and must have an active outreach program for its referring communities.

Level IV - A Level IV Trauma Center has demonstrated an ability to provide advanced trauma life support (ATLS) prior to transfer of patients to a higher level trauma center. It provides evaluation, stabilization, and diagnostic capabilities for injured patients.

Elements of Level IV Trauma Centers Include:

- Basic emergency department facilities to implement ATLS protocols and 24-hour laboratory coverage.   Available trauma nurse(s) and physicians available upon patient arrival.
- May provide surgery and critical-care services if available.
- Has developed transfer agreements for patients requiring more comprehensive care at a Level I or Level II Trauma Center.
- Incorporates a comprehensive quality assessment program
- Involved with prevention efforts and must have an active outreach program for its referring communities.

Level V - A Level V Trauma Center provides initial evaluation, stabilization and diagnostic capabilities and prepares patients for transfer to higher levels of care.

Elements of Level V Trauma Centers Include:

- Basic emergency department facilities to implement ATLS protocols
- Available trauma nurse(s) and physicians available upon patient arrival.
- After-hours activation protocols if facility is not open 24-hours a day.
- May provide surgery and critical-care services if available.
- Has developed transfer agreements for patients requiring more comprehensive care at a Level I though III trauma centers.
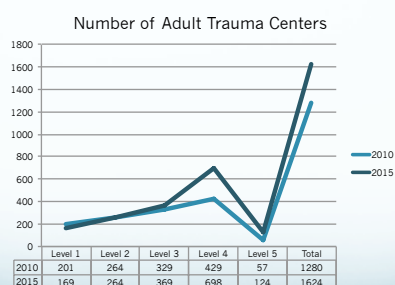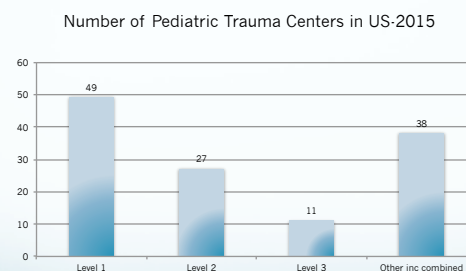

Fig. 31 Number of Adult Trauma Centers in US

Number of Adult Trauma Centers

	Level 1	Level 2	Level 3	Level 4	Level 5	Total
2010	201	264	329	429	57	1280
2015	169	264	369	698	124	1624

Fig. 32 Number of Pediatric Trauma Centers in US

Number of Pediatric Trauma Centers in US-2015

Level 1: 49
Level 2: 27
Level 3: 11
Other inc combined (adult/peds): 38

2. Key Data

Levels of Trauma Centers recognized by the state:

- 89% of respondents (n=34) recognize **Level I Trauma Centers**

  (Adult average 5; total reported 169)

  (Pediatric average 1; total 49)

  *Decreased variance from 2010 is – 16%

- 94% of respondents (n=36) recognize **Level II Trauma Centers**

  (Adult average 7; total reported 264) (Pediatric average 1; total 27)

  *Net variance reported from 2010 is 0%

- 89% of respondents (n=34) recognize **Level III Trauma Centers**

  (Adult average 10; total reported 369) (Pediatric average 1; total 11)

  *Increased variance reported from 2010 is +12%

- 63% of respondents (n=24) recognize **Level IV Trauma Centers**

  (Adult average 21; total reported 698) (No pediatric trauma centers at this level)

  *Increased variance reported from 2010 is +63%

- 23% of respondents (n=8) recognize **Level V Trauma Centers**

  (Adult average 5; total reported 124) (No pediatric trauma centers at this level)

  *Increased variance reported from 2010 is +117%

- **In spite of a net loss in the Level I category, there has been a 27 percent increase in trauma centers overall since 2010.**

- 38 total **combined adult/pediatric trauma centers** were reported in 2015.

V. Medical Direction and Use of Trauma Protocols

This section addresses the findings from the following assessment questions. Click HERE to skip questions and go to narrative.

Q52 Who provides medical direction for your state trauma system?
- State EMS Medical Director
- State Trauma Medical Director
- Our State EMS Medical Director and State Trauma Medical Director share responsbilities
- We do not have a medical oversight position for trauma in our state
- If Other (please specify)

Q53 In what capacity does your state trauma medical director serve?
- Full time
- Part time
- Volunteer
- Contractual
- Our state does not have a state trauma medical director
- Other (please explain)

Q54 Which BEST describes the role of your state's ACS-COT chair in your trauma system?
- Chairs state advisory group
- Serves on state advisory group or EMS Board
- Serves as state trauma medical director
- If Other (please specify)

Q55 Are the CDC Field Trauma Triage Guidelines (version 2011) in use in your state?
- Yes, without modification
- Yes, with modifications
- No, other field triage guideline is used (please specify below)
- No, not at all
- Other (please specify)

Q56 Please indicate the level of control for written protocols or guidelines required for treatment, triage, transport, and tracking of trauma patients (for each item, please check all that apply)
- Trauma patient treatment
- Trauma patient triage
- Trauma patient transfer
- Trauma patient tracking
- Other state or regional guideline that is not based on CDC guidelines

Q57 Does your state trauma triage protocol enable EMS providers to bypass hospitals that are non-designated to receive trauma and transport directly to a trauma center?
- Yes
- No
- Our state does not have a state trauma triage protocol

Q58 Are state trauma triage protocols tracked for compliance?
- Yes
- No
- We do not have state trauma triage protocols in our state

1. Medical Directors and State Trauma Committee

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. Twenty one percent of respondents (n=8) indicate the State EMS Medical Director serves as the State Trauma Medical Director. Thirteen percent of respondents (n=5) indicate they have a separate State Medical Director for Trauma. Sixteen percent of respondents (n=6) indicate the State EMS Medical Director and State Trauma Medical Director have shared responsibilities. Thirty four percent of respondents (n=13) indicate their state does not have a medical oversight position for trauma. Only nine percent of respondents reported that the State Trauma Medical Director is a full time position at the state level and fifteen percent of respondents indicate their State Trauma Medical Director serves as a volunteer (non-compensated) in this capacity.

The American College of Surgeons Committee on Trauma (ACSCOT) 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 ACSCOT Chair who has been an important resource even for states that may not have a designated trauma medical director.

The ACSCOT chair leads the state trauma advisory committee in 10 states, serves on the advisory committee as a member in 13 states, serves as the state trauma medical director in 1 state, and serves in another capacity in 18 states (Fig. 35.)

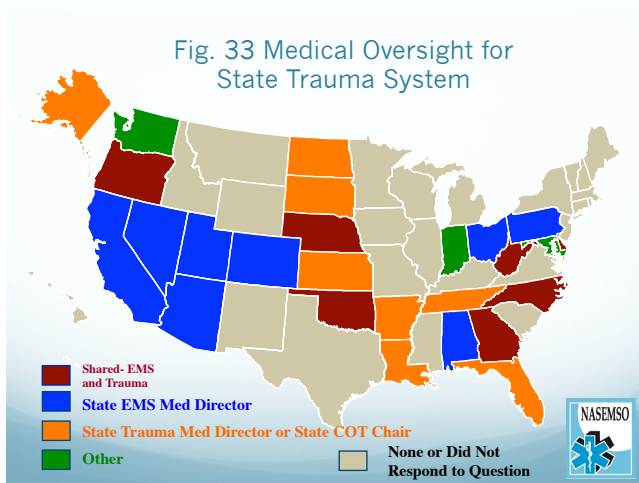
Fig. 33 Medical Oversight for State Trauma System

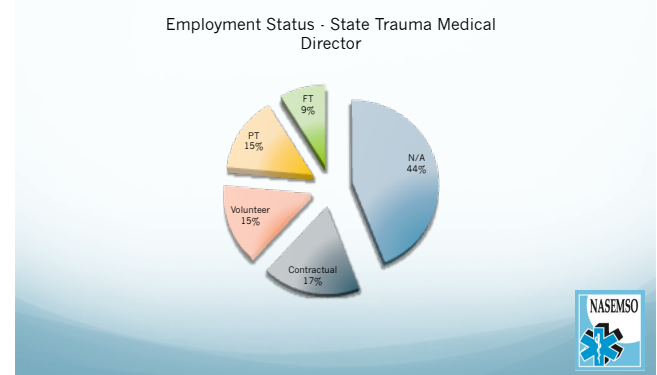Fig. 34 Employment Status State Trauma Medical Director
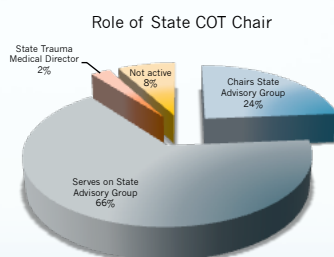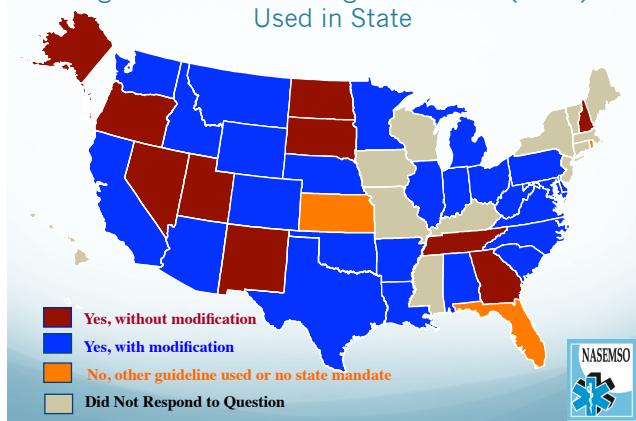
Fig. 35 Role of State COT Chair

Fig. 36 CDC Field Triage Guidelines (2011) Used in State

2. Use of Triage, Treatment, and Transfer 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.

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.

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.
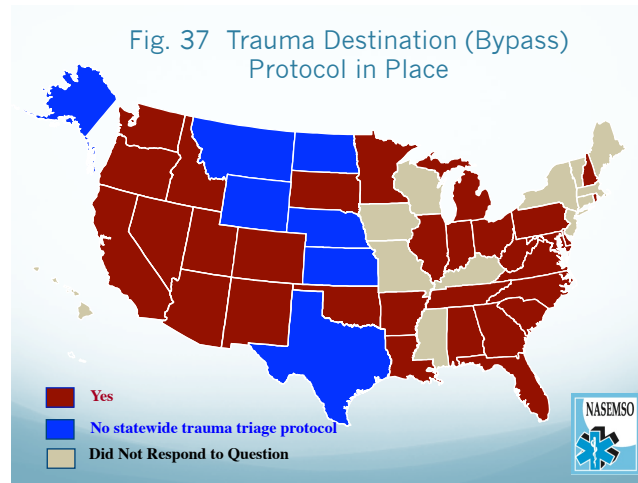
NASEMSO evaluated the level of control for written protocols or guidelines required for treatment, triage, transport and tracking of trauma patients. Of the responding states, the use of a statewide written protocol for trauma patient triage has decreased from 2010 by ten percent to sixty one percent (n=23) and it appears that the authority has started to shift to regional (eighteen percent or n= 7) and local (thirty seven percent or n=14) authorities. The 2011 CDC Guidelines for Field Triage of Injured Patients (or a modified version) is in use by eighty four percent of respondents (n=32), an increase of nine percent from 2010. Of these respondents, the frequency that state, regional, or local authorities modify the CDC Field Triage Guidelines is fifty-eight percent (n=22.) Twenty six percent of respondents (n=10) use the CDC Guidelines without modifying them. Five respondents report a statewide protocol in place that is not based on CDC Guidelines or a lack of a trauma triage protocols altogether.

State trauma triage protocols are tracked for compliance by thirty seven percent of respondents (n=14). In other words, fifty percent of respondents (n=19) do not monitor trauma triage protocols for compliance. Thirteen percent of respondents (n=5) indicate a lack of trauma triage protocols in the state.

Eighty seven percent of respondents (n=32) indicate that state, regional, and local trauma triage protocols enable EMS to transport patients directly to a trauma center and bypass facilities that are not designated as trauma centers.

Forty one percent of respondents (n=15) indicate that trauma patient treatment protocols are in place at the statewide level, eleven percent (n=4) at the regional level, and fifty one percent (n=19) at the local level. These findings are similar to 2010 data.

Similarly, forty three percent of respondents (n=16) indicate the presence of a statewide trauma patient transfer protocol. Regional transfer protocols were noted by twenty four percent of respondents (n=9) and forty six percent of respondents (n=17) indicate that local transfer protocols are in place.

Fig. 37 Trauma Destination (Bypass) Protocol in Place

Yes
No statewide trauma triage protocol
Did Not Respond to Question

3. Key Data

- 21% of respondents (n=8) indicate the State EMS Medical Director serves as the State Trauma Medical Director.
- 13% of respondents (n=5) indicate they have a separate State Medical Director for Trauma.
- 16% of respondents (n=6) indicate the State EMS Medical Director and State Trauma Medical Director have shared responsibilities.
- 34% of respondents (n=13) indicate their state does not have a medical oversight position for trauma.
- 8% of respondents (n=3) indicate the State Trauma Medical Director is a full time position.
- 13% of respondents (n=5) indicate the State Trauma Medical Director is a part time position.
- 13% of respondents (n=5) indicate the State Trauma Medical Director is a volunteer position.
- 16% of respondents (n=6) indicate the State Trauma Medical Director is a contracted position.
- 39% of respondent (n=15) indicate their state does not have a State Trauma Medical Director.
- 26% of respondents (n=10) describe the primary role of the state's ASC-COT Chair as chair of the state trauma advisory group.
- 34% of respondents (n=13) indicate the state COT chair serves on the state advisory group or Board as a member (not chair)
- 3% of respondents (n=1) indicate the state COT chair serves as the State Trauma Medical Director.
- 47% of respondents (n=18) offered additional comments related to the state COT chair including resource but

no official position in state trauma system, ad hoc/advisory role, regional level involvement, involved in injury prevention and performance improvement, 2 respondents indicated the state COT chair is not active, and 2 respondents were not aware their state had a state COT chair.

- 26% of respondents (n=10) use the CDC Field Trauma Triage Guidelines (2011) without modification as the approved trauma triage protocol in their state.

- 48% of respondents (n=22) use the CDC Field Trauma Triage Guidelines (2011) for input but have modified them for the state.

- 3% of respondents (n=1) indicate that triage decisions are handled at the local level.

- 3% of respondents (n=1) indicate there is no trauma triage guideline in use in their state.

- 11% of respondents (n=4) provided comments that indicate the CDC Guidelines were used as a reference but were not implemented in the state.

- Overall, states maintain responsibility for trauma patient triage and trauma patient tracking, however regional/local authorities maintain accountability for decisions related to trauma patient treatment and interfacility transfer of trauma patients.

- 84% of respondents (n=32) enable EMS providers to bypass non-designated hospitals and transport patients directly to a trauma center by protocol.

- 37% of respondents (n=14) monitor state trauma triage protocols for compliance.

- 50% of respondents (n=19) do not monitor state trauma triage protocols for compliance.

- 13% of respondents (n=5) lack a state trauma triage protocol

VI. Data and Performance

This section addresses the findings from the following assessment questions. Click HERE to skip questions and go to narrative.

Q16 Does your state have a state performance improvement plan or guide?
- Yes, we have a "standalone" performance improvement plan or guide just for trauma
- Yes, we have a trauma performance improvement plan or guide but it is integrated with EMS, preparedness, or other plan
- No, we do not have a statewide performance improvement plan or guide

Q17 Please list your top three state trauma performance improvement (PI) measures.

Q43 Does your state have a state Trauma Registry?
- Yes, participation is mandatory
- Yes, but participation is voluntary
- No, our state does not have a state Trauma Registry

Q44 If your state requires participation in the state Trauma Registry, who is required to submit the data?
- All acute care hospitals
- Trauma Centers only
- Our state does not have or does not require participation in the state trauma registry
- If Other (please explain)

Q45 What software is used for the state Trauma Registry?
- Digital Innovations, Inc (NTRACS or Collector)
- ImageTrend, Inc
- Clinical Data Management (Trauma Base)
- Lancet Technology (Trauma One)
- Our state does not have a state Trauma Registry
- If Other (please specify)

Q46 Is your Trauma Registry vendor compliant with the National Trauma Data Bank (NTDB) standards?
- Yes
- No
- Our state does not have a state Trauma Registry

Q47 Who performs data analysis of your state Trauma Registry?
- State staff
- Software vendor
- Contractor
- We do not perform data analysis of our state Trauma Registry
- Our state does not have a state Trauma Registry
- If Other (please specify)

Q48 Are any special reports generated using Trauma Registry data for any of the following target audiences: (please check all that apply)
- Participating hospitals
- Legislature
- Federal agency
- EMS
- General public
- Our state does not have a state Trauma Registry
- If Other (please specify)

Q49 What is the frequency of reporting to the state Trauma Registry?
- At least monthly
- At least quarterly
- At least semiannually
- At least annually
- Time frame related to patient discharge
- Our state does not have a state Trauma Registry

Q50 Is Trauma Registry information integrated (linked) with prehospital data reporting?
- Yes
- No
- Our state does not have a state Trauma Registry

Q51 What software is used for the EMS data registry at the state level?
- ImageTrend
- Digital Innovations
- If Other (please specify)

1. State 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. In 2010, states reported that only trauma centers were required to submit data. In 2015, of thirty seven respondents that reported the existence of a state trauma registry, forty seven percent (n=18) indicate that only trauma centers are required to submit data to the state trauma registry. Thirty four percent of respondents (n=13) indicate that all acute care hospitals are now required to submit data to state trauma registry.
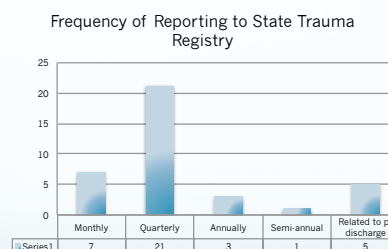
Fig. 38 State Trauma Registry Participation

Availability and Use of State Trauma Registry

	Trauma Centers	All Acute Care Hospitals
Voluntary	16	3
Mandatory	18	13

Fig. 39 Frequency of Reporting to State Trauma Registry

Frequency of Reporting to State Trauma Registry

	Monthly	Quarterly	Annually	Semi-annual	Related to pt discharge
Series1	7	21	3	1	5
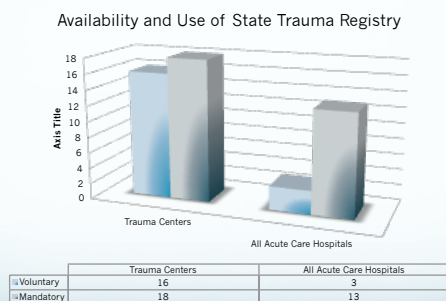
The value of aggregating and analyzing information is largely dependent on how the information is used. Performance improvement is the use of properly analyzed data to evaluate processes and improve trauma patient outcomes. Performance can be measured in several different ways. In general, when evaluating 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. Forty one percent of respondents (n=16) have a state performance improvement plan or guide, five percent of respondents (n=2) have integrated trauma performance measures into the state EMS, preparedness, or other plan, and fifty four percent (n=21) do not have specific performance improvement programs in place (Fig. 40.) Eighty nine percent (n=34) of respondents indicate their trauma registry is compliant with National Trauma Data Bank (NTDB) standards. Eight percent (n=3) are using "home grown" systems that are not NTDB compliant. Consistent with 2010 findings, state staff is expected to perform data analysis. Eighty four percent (n=32) of respondents indicate that state staff performs data analysis, ten percent (n=4) performs data analysis through contracted staff, and five percent of respondents (n=2) do not perform data analysis of the state trauma registry. New findings in 2015 indicate that five percent of respondents (n=2) rely on a software vendor to perform data analysis.

Respondents were asked to list their top state trauma Performance Improvement (PI) measures. The responses were grouped into themes as identified below:

1. Highest- trauma deaths, EMS trauma triage (over/under), and trauma transfers to a higher level of care.
2. Moderate-EMS protocol usage, trauma surgeon arrival, trauma transfers, trauma deaths.
3. Lowest-EMS trauma triage (over/under), trauma activation, response times for trauma surgeon, neurosurgeon, transfer and complications and trauma deaths.
4. EMS protocols and response times for EMS scene time, diagnosis, OR, orthopedic surgeon, ED length of stay and ED to ICU times.

2.   Interface with Prehospital Data

Of the thirty eight states using computerized registry platforms, forty two percent (n=16) integrate trauma registry information with the prehospital data system (Fig. 41), an increase of nine percent from 2010. A six percent increase in the use of commercial software systems specifically for trauma is reported from 2010.

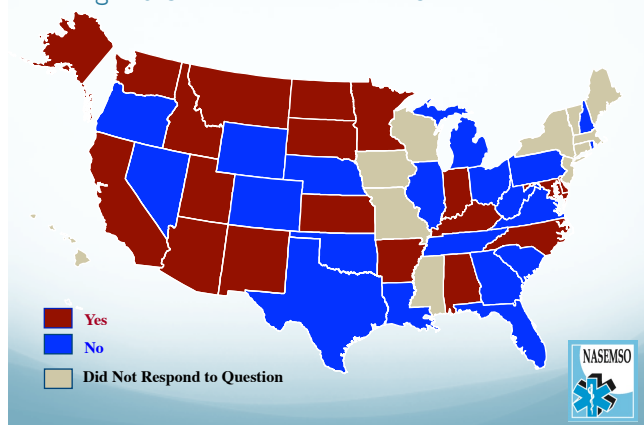Fig. 40 Statewide PI Plan or Guide for Trauma

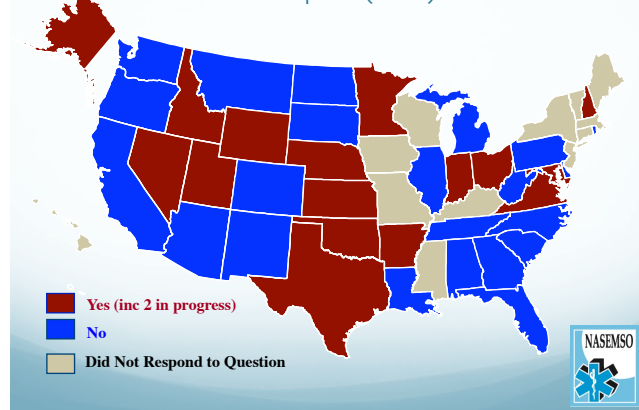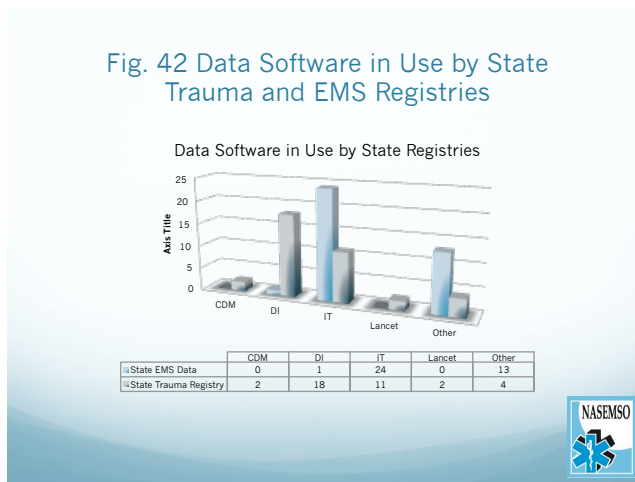Fig. 41 Trauma Registry Electronically Integrated with Prehospital (EMS) Data

Fig. 42 Data Software in Use by State Trauma and EMS Registries

	CDM	DI	IT	Lancet	Other
State EMS Data	0	1	24	0	13
State Trauma Registry	2	18	11	2	4

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 29 states; special reports for the legislature are produced in 19 states; and special reports for other target audiences are produced in 4 states. This information is similar to data collected in 2010. Utilization of software vendors for trauma and EMS is illustrated in Figure 42.

3.   Key Data

- 43% of respondents (n=34) indicate the state has a statewide Trauma Registry and that participation is mandatory.

- 8% of respondents (n=3) indicate the state has a statewide Trauma Registry and that participation is voluntary.

- 3% of respondents (n=1) indicate the state does not have a statewide Trauma Registry.

- 34% of respondents (n=13) indicate that all acute care hospitals are required to submit data to the state trauma registry.

- 47% of respondents (n=18) indicate that only trauma centers are required to submit data to the state trauma registry.

- 47% of respondents (n=18) use Digital Innovations (NTRACS or Collector) software for the state trauma registry.

- 29% of respondents (n=11) use ImageTrend software for the state trauma registry.

- 5% of respondents (n=2) use Clinical Data Management (Trauma Base) software for the state trauma registry.

- 5% of respondents (n=2) use Lancet Technology (Trauma One) software for the state trauma registry.

- 11% of respondents (n=4) mention the use of Dunn (1), Maven (1), and "homegrown" (2) products for the state trauma registry.

- 89% of respondents (n=34) report their trauma registry vendor is compliant with NTDB standards.

- 8% of respondents (n=3) are non-NTDB compliant.

- 84% of respondents (n=32) use state staff to analyze trauma data and trends within the state.

- 5% of respondents (n=2) rely on software vendors to analyze state data and trends.

- 11% of respondents (n=4) hire contractors to analyze state data and trends.

- 5% of respondents (n=2) do not analyze trauma data and trends.

- 13% of respondents (n=5) indicate that data analysis is conducted at the facility or local level.

- 76% of respondents (n=29) report that participating hospitals are the biggest users of trauma data, followed by state legislatures and EMS. Researchers and the general public comprise 43% of requests for data.

- 55% of respondents (n=21) required data submission on a quarterly basis.

- 61% of respondents (n=23) indicate that trauma registry information is not linked with prehospital data reporting.

- 37% of respondents (n=14) ensure linkages between EMS and trauma reporting systems.

- 63% of respondents (n=24) use ImageTrend software for EMS data collection

- 36% of respondents (n=14) use a range of EMS software, including several "homegrown" databases.

VII. Educational Requirements

This section addresses the findings from the following assessment questions. Click HERE to skip questions and go to narrative.

Q40 Which educational offerings does your state require for trauma center administrative or non-clinical staff? (Please check all that apply)
- ATS Trauma Program Manager Course (TPM)
- ATS Trauma Registrar Course (TRC)
- ACS Rural Trauma Team Development Course (RTTDC)
- STN Trauma Outcomes and Performance Improvement Course (TOPIC)
- TCAA Trauma Medical Directors Course
- TCAA Finance and Business Planning Course
- Other (please specify below)
- Our state does not have educational requirements for trauma center administrative or non-clinical personnel

Q41 Which educational offerings does your state require for trauma center clinical personnel?(Please check all that apply)
- Advanced Burn Life Support (ABLS)
- Advanced Pediatric Life Support (APLS or PALS)
- Advanced Trauma Life Support (ATLS)
- Advanced Trauma Care for Nurses (ATCN)
- Basic Trauma Life Support (BTLS)
- Course in Advanced Trauma Nursing (CATN)
- Prehospital Trauma Life Support (PHTLS)
- Trauma Nursing Core Course (TNCC)
- Other (please specify below)
- Our state does not have trauma specific education requirements for trauma center clinical personnel

Q42 If your state requires trauma education, does it provide any financial support or other incentives for these programs?
- Yes
- No
- Trauma specific education is not a requirement in our state

1. Required Education for Administrative and Non-Clinical Staff

Training and professional development of the trauma workforce is critical to a viable trauma system. There are several administrative and clinically oriented programs for trauma professionals including physicians, program directors, nurses, trauma registrars, and prehospital emergency medical personnel available from various professional organizations, including the American College of Surgeons (ACS), the American Trauma Society (ATS), the Emergency Nurses Association (ENA), the National Association of EMTs (NAEMT), the Society of Trauma Nurses (STN), and the Trauma Center Association of America (TCAA). The assessment did not seek to make any recommendations related to these programs, the purpose of the assessment was merely to estimate the use of mandatory education in the areas of trauma system planning and development.

Fig. 43 Educational Requirements for Trauma Center Administrative or Non-Clinical Staff
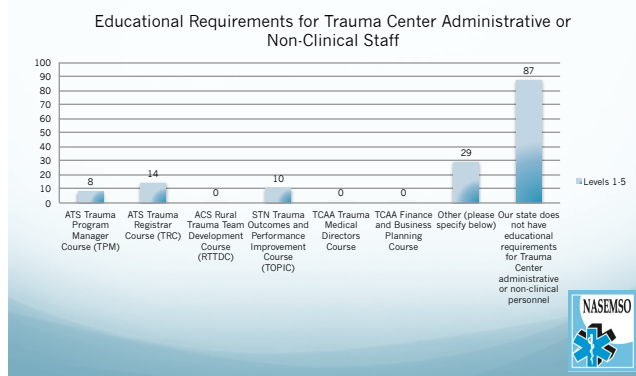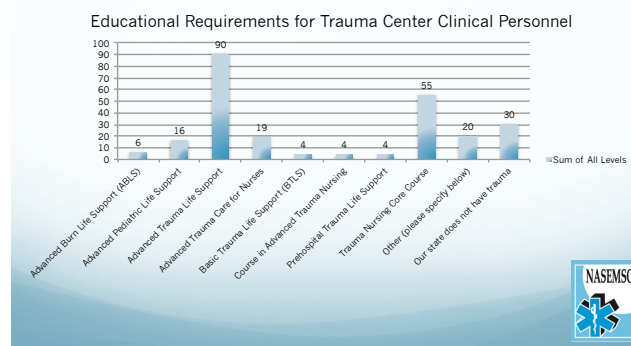

Fig. 44 Educational Requirements for Trauma Center Clinical Personnel

2. Required Education for Trauma Center Clinical Personnel

While continuing education (CE) and/or periodic re-examination have been utilized by states in the professional licensure and relicensure process and widely accepted in EMS as a method of maintaining and enhancing individual competence, NASEMSO recognizes that there are multiple methods by which an individual may demonstrate continuing competence. We have observed in related studies that professional competency models support the need for individual responsibility through self-assessment, development and implementation of a personal learning plan and periodic reassessment to achieve the goals of continuing competence. NASEMSO supports the state oversight role and coordination with medical directors, EMS agencies, and trauma centers to ensure that these goals are adequately accomplished and documented. In 2015, NASEMSO conducted a competency assessment summit in conjunction with its Education and Professional Standards Council to discuss the topic of clinical competency in the context of the state relicensure process. The findings and recommendations of the summit may be useful in the state trauma center verification process. The resource is available at http://nasemso.org/EMSEducationImplementationPlanning/documents/Continuing-Competence-White-Paper-Apr2015.pdf.

3. Key Data

- 85% of respondents (n=23) do not have educational requirements for trauma center administrative or non-clinical personnel for designation purposes.

- 84% of respondents (n=21) require the Advanced Trauma Life Support Course (ATLS) for physicians.

- 75% of respondents (n=12) require the Trauma Nursing Core Course for nurses working in trauma centers.

- 37% of respondents (n=14) offer state assistance with costs for conducting trauma courses.

- 47% of respondents (n=18) do not offer state assistance with costs for conducting trauma courses.

- 16% of respondents n=6) indicate that trauma specific education is not a requirement in the state.

VIII. Strengths, Weaknesses, Opportunities, and Threats (SWOT) Analysis

As a result of the 2015 assessment, NASEMSO provides the following summary regarding the status of statewide trauma system planning and development of the past decade:

STRENGTHS	WEAKNESSES
• State oversight of trauma systems • State trauma program administratively affiliated with the State Health Department • Close alignment of trauma and EMS programs at the state level • Legislative authority to regulate/designate trauma centers • State trauma plans based on national guidelines • Statewide/regional stakeholder oversight of the trauma system • Trauma center verification and designation processes identified • State trauma registry capabilities • Reporting based on state trauma registry data • National Trauma Data Bank compliance by trauma centers • State participation in injury prevention activities (i.e. "Toward Zero Deaths") • State ACSCOT chair involvement in the state trauma system • State use of CDC Field Trauma Guidelines (version 2011) • Trauma triage protocols that enable EMS personnel to bypass directly to a trauma center	• Lack of an identified/coordinating role for the state trauma program in the state disaster response plan • MCI plans that do not integrate trauma centers into response planning efforts • Lack of consistency for mandatory trauma education • Medical direction for the state trauma system • Lack of statewide/trauma center performance improvement plan • Lack of injury rehabilitation expertise on state trauma committees
OPPORTUNITIES	**THREATS**
• Enhanced injury prevention activities based on state patterns/trends • Integrated prehospital data reporting • Monitoring of state trauma triage protocols for compliance • Trauma registries for all acute care hospitals • Trauma registry data analysis performed by the state • State coordination of time sensitive conditions/systems • Standardization of rehabilitation interface with trauma data registries • State trauma program Involvement in public information & education beyond injury prevention • Use of social media • Educational requirements and offerings for trauma administrative and clinical staffs	• Lack of financial support for state trauma programs at the federal level • Increasing responsibilities for the state trauma manager • Lack of legislative authority to limit the number/location of trauma centers • Lack of financial support for trauma education programs

IX. Index of State Trauma Program -Web Sites

STATE	URL
Alabama	adph.org/ats
Alaska	http://dhss.alaska.gov/dph/Emergency/Pages/trauma/default.aspx
Arizona	http://www.azdhs.gov/bems/trauma/index.htm
Arkansas	http://www.healthy.arkansas.gov/programsServices/injuryPreventionControl/TraumaticSystems/Pages/default.aspx
California	http://www.emsa.ca.gov/Trauma
Colorado	https://www.colorado.gov/pacific/cdphe/categories/services-and-information/health/emergency-care/trauma-services
Delaware	http://www.dhss.delaware.gov/dhss/dph/ems/trauma.html
Florida	http://www.floridahealth.gov/licensing-and-regulation/trauma-system/index.html
Georgia	http://dph.georgia.gov/EMS
Idaho	tse.idaho.gov
Illinois	http://www.dph.illinois.gov/topics-services/emergency-preparedness-response/ems/trauma-program
Indiana	http://www.in.gov/isdh/19537.htm
Iowa	http://idph.iowa.gov/bets/ems
Kansas	www.kstrauma.org
Kentucky	http://www.kyha.com/CM/Initiatives/Kentucky_Trauma_System/CM/Initiatives/Kentucky_Trauma_System.aspx?hkey=157f72c4-75a4-428c-892e-6ca8effa75e7
Louisiana	www.lern.la.gov
Maryland	www.miemss.org/home/
Michigan	www.michigan.gov/traumasystem
Minnesota	http://www.health.state.mn.us/traumasystem/
Montana	http://dphhs.mt.gov/publichealth/EMSTS/traumasystems.aspx
Nebraska	http://dhhs.ne.gov/publichealth/nebraskaems/pages/Trauma.aspx
Nevada	www.dpbh.nv.gov/Reg/EMS/EMS-home/
New Hampshire	http://www.nh.gov/safety/divisions/fstems/ems/index.html
New Mexico	http://archive.nmems.org/

New York	http://www.health.ny.gov/professionals/ems/state_trauma/index.htm
North Carolina	http://www.ncdhhs.gov/dhsr/EMS/ems.htm
North Dakota	https://www.health.nd.gov/epr/emergency-medical-systems
Ohio	ems.ohio.gov
Oklahoma	http://www.ok.gov/health/Protective_Health/Emergency_Systems/Trauma_Division/index.html
Oregon	http://public.health.oregon.gov/ProviderPartnerResources/EMSTraumaSystems/Pages/index.aspx
Pennsylvania	http://www.ptsf.org/
Rhode Island	http://www.health.ri.gov/programs/emergencymedicalservices/
South Carolina	https://www.scemsportal.org/documentsandlinks/r61-116-south-carolina-trauma-care-systems
South Dakota	http://doh.sd.gov/providers/ruralhealth/trauma/
Tennessee	http://tn.gov/health/article/ems-trauma
Texas	http://www.dshs.state.tx.us/emstraumasystems/
Utah	https://health.utah.gov/ems/
Virginia	www.vdh.state.va.us/OEMS/Trauma/index.htm
Washington	http://www.doh.wa.gov/ForPublicHealthandHealthcareProviders/EmergencyMedicalServicesEMSSystems/TraumaSystem
West Virginia	www.wvoems.org
Wyoming	http://health.wyo.gov/sho/ems/index.html

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