WELCOME

Achieving Zero Preventable Deaths: Creating a National Trauma System

EMSFocus
Today

- The State of Trauma in the U.S.
- Zero Preventable Deaths
- Findings from the American College of Surgeons Committee on Trauma
- Lessons Learned From the Military
- How to Implement the NASEM Report

Today’s Speakers

- Cathy Gotschall, ScD, Senior Health Scientist
  - NHTSA Office of EMS
- Ronald Stewart, MD, Chair of the Committee on Trauma
  - American College of Surgeons
- Col. (ret.) John Holcomb, MD, FACS, Professor of Surgery
  - UT Health in Houston, TX
Cathy Gotschall, ScD
Senior Health Scientist
NHTSA Office of EMS

Trauma in the U.S.

- Trauma is the leading cause of death for Americans, ages 1-46
- 96 deaths per day

Sources:
- NHTSA Fatality Analysis Reporting System (FARS)
- National Academies of Science, Engineering and Medicine. A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury

20% of trauma deaths are preventable with optimal emergency and trauma care.
Trauma in the U.S.

Sources:
- NHTSA National Automotive Sampling System-Crashworthiness Data System (NASS-CDS)
- NHTSA Fatality Analysis Reporting System (FARS)
- Mackenzie et al., 2006

FARS and NEMSIS Version 3.0

- 42% of all MVC fatalities in 2015 occurred after the victim arrived.
- NASEM estimates 1 in 5 deaths from traumatic injuries may be preventable with optimal trauma care.
- NEMSIS V3 will collect data on the number of patients transported by EMS to all levels of trauma centers.
EMS Countermeasures

- Use of Field Trauma Triage Guidelines to transport patients to trauma centers
- Use of Mass Casualty Incident Triage Guidelines
- Use of the evidence-based guidelines for prehospital pain management
- Use of the evidence-based guidelines for prehospital management of traumatic brain injury
- Use of the evidence-based guidelines for external hemorrhage control
- Use of the National Model EMS Clinical Guidelines

NHTSA’s Strategic Plan

- The Road Ahead
  - Includes a strategic objective to increase survivability from crashes with the following performance indicator:

  **By 2021, save an additional 500 lives by enhancing crash recognition, response, and emergency medical care**
Ronald Stewart, MD
Chair of the Committee on Trauma
American College of Surgeons

Achieving Trauma Zero Preventable Deaths and Disability #TraumaZPDD

- Implementation Strategy for the National Academies Report:

  A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths after Injury
History of NASEM Recommendations

- 1966 National Academies of Science Whitepaper
- 2016 National Academies of Science, Engineering and Medicine
- Military & civilian physicians and scientists
- From extended combat experience

A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths after Injury

- Comprehensive in scope
- Eleven summary recommendations
- Military and Civilian Trauma Systems: One nation, one system

The Vision: A National Trauma Care System

A national strategy and joint military-civilian approach for improving trauma care is lacking. A unified effort is needed to ensure the delivery of optimal trauma care for the entire American population within the United States and on the battlefield.

The Vision: A National Trauma Care System

Recommendation 1: The White House should set a national aim of achieving zero preventable deaths after injury and minimizing trauma-related disability.

- The 75 percent owner and/or...
Position statement of the Coalition for National Trauma Research on the National Academies of Sciences, Engineering and Medicine report, *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury*

Coalition for National Trauma Research (CNTR), Donald H. Jenkins, MD, William G. Cioffi, MD, Christine S. Cocanour, MD, Kimberly A. Davis, MD, MBA, Timothy C. Fabian, MD, Gregory J. Jurkovich, MD, Grace S. Rozycki, MD, MBA, Thomas M. Scalea, MD, Nicole A. Stassen, MD, and Ronald M. Stewart, MD, San Antonio, Texas

Position statement of the American College of Surgeons Committee on Trauma on the National Academies of Sciences, Engineering and Medicine Report, *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury*

Donald H. Jenkins, MD, Robert J. Winchell, MD, Raul Coimbra, MD, PhD, Michael F. Rotondi, MD, Leonard J. Weisberg, MD, Eileen M. Bulger, MD, Rosemary A. Kozar, MD, PhD, Avery A. Nathens, MD, Patrick M. Reilly, MD, Shannon M. Houry, MD, Maria F. Jimenez, MD, Michael C. Chong, MD, Michael Coburn, MD, Jimm Dodd, MA, Melanie L. Neal, MS, Justin Rosen, Jean Clemency, David B. Hoyt, MD, and Ronald M. Stewart, MD, Chicago, Illinois
The Aim

- Recommendation 1: The White House should set a national aim of achieving zero preventable deaths after injury and minimizing trauma-related disability
- The 75th Ranger Regiment demonstrated that achieving zero preventable deaths is an achievable goal when leadership takes ownership of trauma care and data is used for continuous reflection and improvement.


Implementation Strategy

- Break down the spaces into manageable and relatable areas
- Work towards a cohesive communication strategy
  - Is naturally organizing and aligning
  - Encompasses the whole
  - Patient centered
  - Provides a framework for describing the needed action from Academies report
- Provide a civil, collegial and inclusive forum for dialogue and strategy
- Advocacy – status quo favors inaction
**ACS Committee on Trauma Pillars**

**TABLE 1. ACS COT Four-Pillar Approach to the National Leadership in Trauma**

<table>
<thead>
<tr>
<th>Advanced Trauma Education</th>
<th>Ensure Quality Patient Care</th>
<th>Champion Trauma Systems Strength</th>
<th>Drive Advocacy</th>
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| Accredited continuing education programs that support medical professionals across the continuum of trauma care.  
  - ATLS course  
  - TEAM course  
  - ATOM course  
  - RTIDT course  
  - DMEP course  
  - ASSET course  
  - “Stop the Bleed” campaign  
  - Basic Endovascular Skills for Trauma | A verification program helps trauma centers verify resources, ensure readiness, and improve trauma care. The quality cycle continues with TQIP, a risk-adjusted local and national benchmarking program to measure and inform the improvement of outcomes and PIPS, a performance improvement and patient safety program that continuously measures and evaluates in order to improve care.  
  - Resources for Optimal Care of the Injured Patient  
  - VRC  
  - TQIP  
  - PIPS | Comprehensive expert assessment and consultative guidance for the improvement or development of state and regional trauma systems. Integrates and partners with multidisciplinary teams in each locality or region.  
  - Trauma Systems Consultation for counties, regions, states, or systems  
  - Benchmarks, Indicators and Scoring facilitations | Advocacy activities at the federal and state level focused on prevention, socioeconomic, legislative, and regulatory issues affecting trauma care. Develop and advocate health care policy that is in the best interest of trauma patients, such as the Stop the Bleed Campaign (also known as bleeding control or BCon). Promote injury prevention and control programs aimed at reducing needless injury, death, and suffering |

**Path to #TraumaZPDD Five Broad Relatable Domains**

- Trauma and EMS system infrastructure and organization
- Trauma related research and research funding
- Trauma data and data linkage
- Trauma work force, education, training and readiness
- Advocacy as an overarching umbrella

NIH Campus April 2017  
169 attendees:  
½ physicians  
½ nurses, paramedics, public health, policy makers  
¼ COT members
The Big Problem

- More deaths in children than all other causes combined
- More than 130,000 Americans die every year
- Health care costs + lost productivity = $671 billion/year
- *Most important problem of our children and uniformed service personnel*

Still most pressing and neglected public health problem in U.S.

Much Progress Has Been Made
Past 50 Years

- Dramatic improvements in care and prevention
- Entire professional disciplines established
  - EMS
  - Emergency medicine
  - Trauma nursing
  - Trauma surgery
- Radical changes in quality
- Research and scholarship flourished
- Data systems unimaginable in 1966
- Educational transformation around trauma care
- Major reductions in mortality and complications

Problem?: Trauma System Infrastructure

- Trauma system: Still a patchwork quilt with major access gaps in some areas – true over proliferation in other areas
Problem?: Research and Research Support

- Research: Lack of priority research funding for trauma and acute care research from any federal source – possible exception of the DOD

“In the Bible, we are admonished to lay up corn so that the land would not perish through famine. If we fail to invest in future education and research, we may have a medical famine.”

Tim Fabian, 2017 #TraumaZPDD
Next Steps with Research Action Plan

- National Trauma Research Action Plan
  - Articulate a unified Research Agenda across the continuum of care
  - Define the Ask for financial investment
  - Define a strategy for a federal home for trauma research funding
  - Develop strategies to address regulatory burden
  - Develop a unified approach to advocacy

Next Steps?

- ADVOCACY, ADVOCACY, ADVOCACY
- Define Research Agenda and priorities to support advocacy efforts
- Advocate for a National Trauma Research Institute?
- Bring all organizations interested in trauma research together to advocate with a unified/coordinated approach
  - Eliminate “bone/blood/burn/brain”
- Engage the public and trauma survivors in advocacy efforts

Eileen Bulger
Problem?: Data Gaps

- Data and data linkage: greatly improved but promise not yet realized
- Data gaps at the temporal extremes
  - Death in the field
  - Long term outcomes
Problem?: Workforce

- Military & civilian workforce:
  - Lessons lost between conflicts
  - Military battlefield lessons not reliably translated to civilian care
  - Civilian advances not reliably translated to military care

Solution: Integrate Civilian and Military Trauma Education and Readiness
A National Trauma Action Plan

- We need a great trauma system to get to #TraumaZPDD
- We can’t have a great trauma system without great research
- We can’t have great research without great data
- We can’t implement a great trauma system without great education and training

- We need a national trauma action plan

Peter W. Thomas: #TraumaZPDD Patient Speaker

- Advocate
- Attorney
- Leader
- Trauma survivor
- Improve both advocacy and patient care by increased involvement of trauma survivor community
The Time is Now

- 50 years since the first great strides were made
- National Academies of Medicine Report
  - 1966 and 2016
- Turbulent times
- Aligned civilian and military leaders
  - Committed group of young and senior leaders
  - Organized commitment
- Still critical need with large burden of disease
- Critical for national and homeland security
- Critical for our children
- Prehospital care critical to getting to #TraumaZPDD

John B. Holcomb, MD, FACS
COL (USA ret.)
Professor of Surgery
UT Health, Houston, TX
Lessons Learned from Iraq and Afghanistan

1. No system →
2. No registry →
3. No tourniquets →
4. No charts →
5. No communication →
6. No performance improvement →
7. No research →

Starting in 2004 a lot better

Prehospital Battlefield Trauma Care: 1992

- Based on trauma courses NOT developed for combat
- No tactical context for care rendered
- Heavy emphasis on endotracheal intubation vs bleeding control
- Medics taught NOT to use tourniquets
- No hemostatic agents
- No junctional tourniquets

- SOF medics – IV cutdowns for difficult venous access
- 2 large bore IVs on all casualties with significant trauma
- 2 large volume crystalloid fluid resuscitation for shock
- Civil War-vintage technology for battlefield analgesia (IM morphine)
- No focus on prevention of trauma-related hypothermia and coagulopathy
Prehospital Battlefield Trauma Care: Now

- Phased care in TCCC
- Aggressive use of tourniquets
- Combat Gauze as hemostatic agent
- Aggressive needle thoracostomy
- Sit up and lean forward airway positioning
- Surgical airways as needed for facial trauma
- Hypotensive resuscitation (with blood products)
- IVs only when needed; IO access if required
- PO meds, OTFC, ketamine as “Triple Option” for battlefield analgesia
- Hypothermia prevention; avoid NSAIDs
- Battlefield antibiotics
- Junctional Tourniquets/XStat

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<th>What We Are Doing in Houston</th>
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<tr>
<td>2008 – Tourniquets on helicopters and in the ED</td>
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<tr>
<td>2010 – Tourniquets on ambulances</td>
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<tr>
<td>2011 – Tourniquets and hemostatic dressings for 5,000 police</td>
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<tr>
<td>2012 – Plasma and RBCs on helicopters</td>
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<tr>
<td>2016 – Preventable death rate study (all 1,864 trauma deaths)</td>
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<td>2016 – Stop the Bleed (hospitals, schools, etc)</td>
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<td>2017 – Should have whole blood prehospital next week</td>
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Who would benefit the most from a National Trauma System?

- U.S. Military: Approximately 1,000 potentially preventable deaths from combat trauma 2001-2011
- U.S. Civilian Sector: Approximately 20,000 to 30,000 potentially preventable deaths from trauma every year

*Berwick, Downey, Cornett
JAMA 2016*
Tactical Combat Casualty Care: Lessons from 14 Years of War

Dr. Frank Butler
Chairman, TCCC

What Can TCCC Offer to My Civilian EMS System?

- Experience and advances from 14 years of war
  - Function with a system and drive interventions with data
- Tourniquets
- Hemostatic dressings
- Trauma airway approach
- TCCC Needle Decompression Plan
- Hypotensive resuscitation – with blood products where possible
- Intraosseous vascular access
- Triple-Option Analgesia
Elements of a National Prehospital Trauma Care System

- Immediate Responders
  - Teachers and school officials
  - Mass transportation workers
  - Malls and sports events workers
  - Nightclub workers
  - Church workers

- Professional First Responders
  - Law enforcement officers
  - Fire and rescue/tactical medics
  - EMS personnel

Proposed Standards of Care

- Lay Persons
  - Bleeding Control (B-CON) for the injured (Hartford Consensus)

- Law Enforcement Officers
  - B-CON or Law Enforcement First Responders (Hartford Consensus)

- Fire and Rescue and Tactical Medics
  - TCCC for Medical Personnel OR TECC

- EMS Personnel
  - Prehospital Trauma Life Support (PHTKS) – (updated to reflect TCC advances as appropriate for the civilian sector)
What You Can Do

› Use the NASEM Report as a guide
› Get involved
› Work with your trauma system
› Drive innovations with data
› Share results

Thank You

Q&A

To download the NASEM report: