

**Trauma and Injury Subcommittee:
Lessons Learned in Theater Trauma Care in
Afghanistan & Iraq**

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Defense Health Board
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Overview

- Trauma and Injury Subcommittee Membership
- Charge
- Background on the Request
- The Joint Trauma System
- Way Ahead
- Timeline
- Questions

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Subcommittee Membership

- James (Jim) Bagian, MD, PE
- CAPT (Ret) Brad Bennett, PhD, NREMT-P, FAWM
- CAPT (Ret) Frank Butler, Jr., MD
- Jeffrey Cain, MD
- David Callaway, MD, MPA
- Norman McSwain, Jr., MD, FACS
- CAPT Edward (Mel) Otten, MD, FACMT, FAWM
- CAPT (Ret) Peter Rhee, MD, MPH

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Charge

- The Under Secretary of Defense (Personnel & Readiness) requested that the Board summarize **lessons learned in trauma care in Iraq and Afghanistan**, and propose a **strategy for preserving these lessons** in future conflicts

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Background

- November 2011: Dr. Rotondo briefs DHB & CoTCCC
- May 2012: USD(P&R) request received
- August 2012: Tasked to Trauma and Injury Subcommittee
- November 2012: Subcommittee teleconference to plan way ahead

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Joint Trauma System

Factors for survival

- **Energy Production**
 - Aerobic metabolism
 - Fick principle
 - Required for organ survival
- **Hemorrhage control**
 - **Torso hemorrhage**
 - Medical facility
 - Clotting factors
 - **Extremity Hemorrhage**
 - Pressure
 - Tourniquet

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Joint Trauma System

Blood

- Oxygen carrying capacity
- Stopping leaks in vessels (Clotting factors)
- Volume retention (Oncotic pressure)
 - Crystalloid is BAD.
 - Plasma is GOOD.
- Red Cells transfusion = HEMS & in-hospital
- Plasma
 - FFP = HEMS & in-hospital
 - Liquid = Field, HEMS, In-hospital
 - Lyophilized = not US available

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Joint Trauma System

Hemorrhage Control

- Coagulation (clotting system)
 - Intrinsic ← Factors I - XII
 - Extrinsic
 - Final pathway (Factor XIII)
- Factor XIV
 - Clamp
 - Ligature

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Joint Trauma System

US Department of Transportation

National Traffic and Highway Safety Administration
NHTSA

Trauma System Agenda for the Future

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Joint Trauma System

Trauma System Agenda for the Future

Fundamental Components of the Trauma Care System

- **Injury Prevention**
- **Prehospital Care**
- **Acute Care Facilities**
- **Post-hospital Care**

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Joint Trauma System

Trauma System Agenda for the Future

- **What Is Trauma System**
- **A trauma system is an organized, coordinated effort..... that delivers the full range of care to all injured patients True value of a trauma systemseamless transition between each phase of care, integrating existing resources to achieve improved patient outcomes.**
- **Trauma systems**
 - regionalized,
 - efficient use of health care resources.
 - based on the unique requirements of the population served,
 - seamless and effective care
 - ability to expand to meet the medical needs of the [military]

US Military Joint Trauma System

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Joint Trauma System

Trauma System Agenda for the Future

Conclusion

- **Trauma is predictable.**
 - It happened yesterday,
 - it is happening today, and
 - It will happen tomorrow

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Joint Trauma System Trauma System Agenda for the Future

Conclusion

Efficiency in patient care is solution

- Hemorrhage
- Energy production

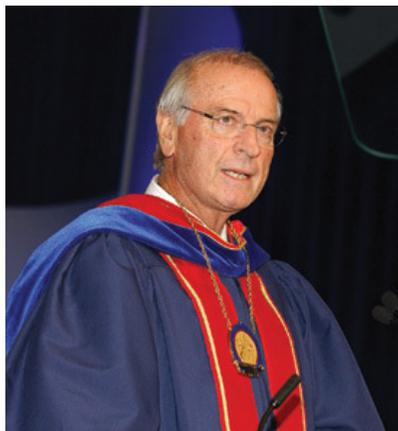
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.....time is truly a life and death matter

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Joint Trauma System



A. Brent Eastman, MD FACS
President, American College of Surgeons

Inclusive trauma system

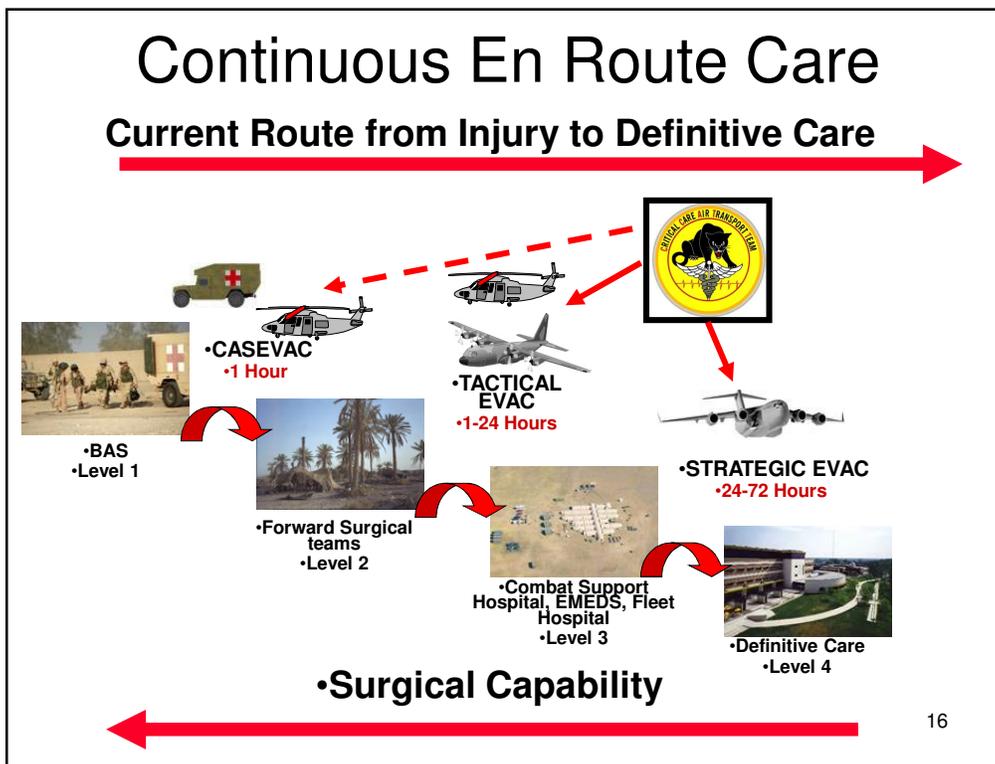
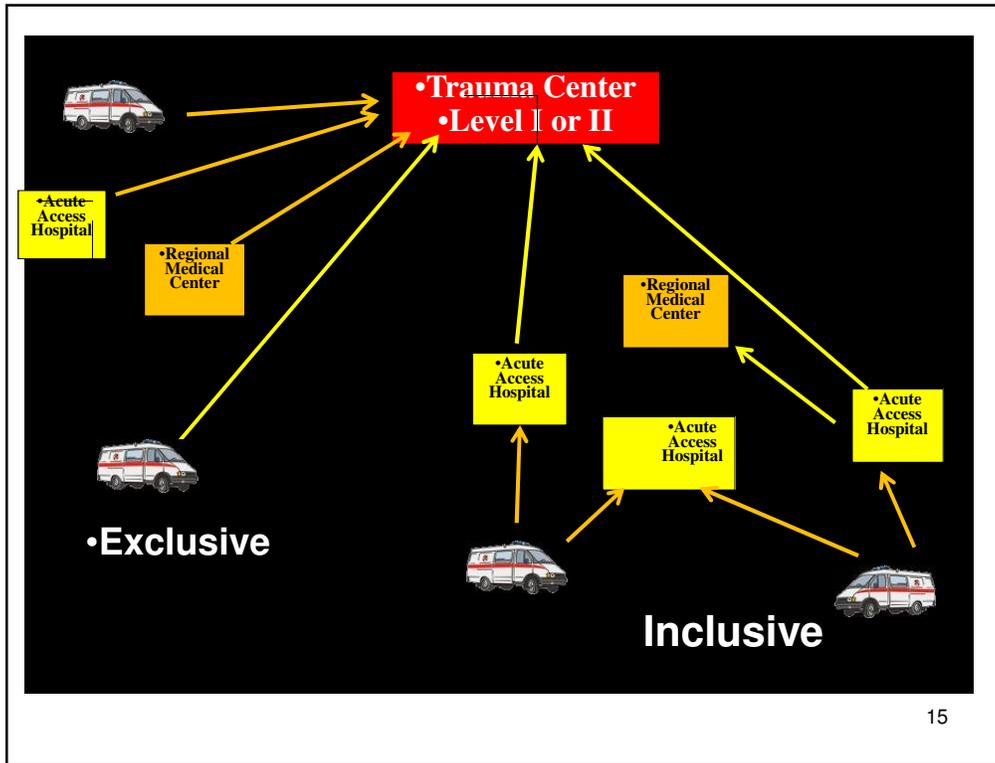
- *Cooperative management*
- *Initial resuscitation*
- *Immediate hemostasis*

Exclusive trauma system

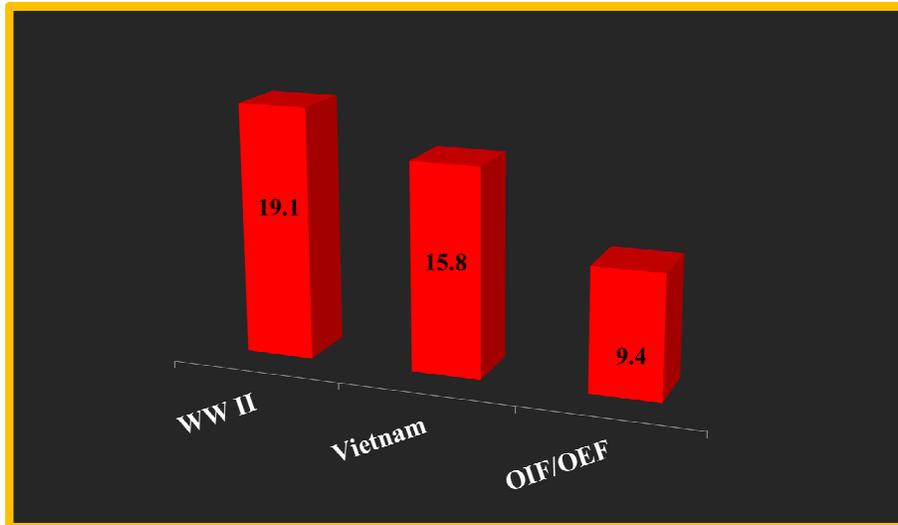
- *Transfer to trauma center*
- *EMT care en route*

Scudder Oration 2009
ACS Presidential address 2012

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Comparison Battle Casualties 1941-2005



Best in US History

Fatality Rate = Die/Wounded %

•*Holcomb et al J Trauma 2006*

Joint Trauma System

Trauma Center vs Trauma System

- **Trauma Center**
 - Single hospital
 - Full service trauma care
 - Level I, II or III
- **Trauma System**
 - Series of Hospitals
 - Community hospitals
 - Trauma hospitals
 - Appropriate hospital for condition
 - System wide registry
 - Oversight by system director
 - Quality Assurance
 - Inclusive or Exclusive



Joint Trauma System

- **Inclusive systems**
 - Cooperative management
 - Upward movement of patients as necessary
 - Exchange of medical information
- **Exclusive Systems**
 - Direct transfer to the trauma
 - EMT care

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Dominique-Jean Larrey



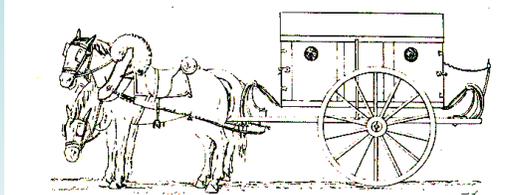
- Director of Napoleon's ambulance service 1797- 98
- Not unusual for wounded to be in the field 7-10 days

•“At Lemberg.... The remoteness of our ambulances deprived the wounded of the requisite attention.....I was authorized to construct a carriage which I called the flying ambulances”

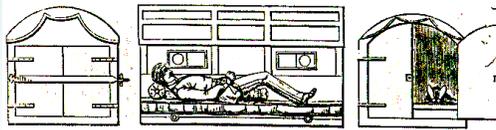
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Dominique-Jean Larrey



Larrey's light ambulance that was in use during the Napoleonic Wars.



From left to right: the front, the interior, and the rear views of Larrey's flying ambulance cart.

- "Flying ambulance"
- Trained medical personnel
- Went into battlefield
- Controlled hemorrhage
- Transported to nearby hospital
- Provided care en route
- Front line hospitals

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Joint Trauma System

Inclusive Trauma System Joint Trauma System(JTS)

- Organized care
- PreHospital care
- Staged surgical care
- Quality assurance
- Information exchange
- Trauma Registry
- JTS oversight
- TCCC
- Levels I-V
- Missing
- Weekly telecoms
- JTS registry

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Joint Trauma System

Trauma System Agenda for the Future

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US Military Joint Trauma System

JTS²³



Inclusive Trauma Systems

As an additional incentive to
maintain the Joint Trauma
System

15 % reduction in mortality rate

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**The Joint Trauma System
is to the military
as the state trauma systems
are to the
civilian community**

**It is critical to casualty care
It cannot be allowed to vanish with
force reduction**



Way Ahead

- Consolidate lessons learned from The United States Military Joint Trauma System Assessment
- Review American College of Surgeons Joint Trauma System report (recently approved by the Committee on Trauma Executive Committee, and up for review by the ACS Board of Regents in February)
- Brainstorm lessons learned internally among Trauma and Injury Subcommittee members



Timeline

- Late January 2013: T&I Meeting to outline key list of lessons learned
 - Assign leaders to work each key lesson
- February-July 2013: Collate lessons learned and finalize recommendation
- August 2013: Brief findings and proposed recommendation to the Board

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Questions?
Comments?
Paranoid outbreaks?

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