Review of the Defense Health Board's
Combat Trauma Lessons Learned from Military Operations of 2001-2013 Report

August 9, 2016

Problem Statement

- The survival rate of Service members injured in combat has significantly improved during the recent decade of military conflict due to advances in trauma care and knowledge gained by medical personnel in the prehospital far forward environment.

- It is important that the advancements resulting in these increased survival rates not be lost but, rather, sustained and expanded with research so immediate re-implementation is possible in the event of future conflict.

- "The in-depth information and recommendations in the report enable [the Office of the Assistant Secretary of Defense for Health Affairs] to consider approaches to enhance Combat Casualty Care."

- "The majority of the recommendations align well with policies under development and validated joint requirements; others are addressed in current programs of record."

Two major policies that are in the development process support the recommendations in the report:

- First, "a policy for the Joint Trauma System Center of Excellence in the Department of Defense (DoD) will seek to establish and maintain an enduring global trauma care capability that supports the full range of military operations. The Defense Health Agency (DHA) would issue appropriate procedural instructions related to this policy."

- "The second policy is the update of guidance for Military Readiness Training, which will address training for military personnel in Tactical Combat Casualty Care (TCCC)."

- "The DoD shall continue extensive TCCC training and work to expand trauma care training."

- "We will continue to develop our trauma training strategies to take advantage of the latest technologies, such as medical simulation and work to expand strategic partnerships with civilian trauma centers."

- "The DoD continues to be involved with extensive research related to trauma care through the efforts of the Combat Casualty Care Research Program (CCCRP)."

- "The CCCRP seeks to develop knowledge and material solutions related to battlefield trauma."

- The realization of the recommendations in the report will take significant time and effort.

- DoD is "committed to continue the delivery of high quality trauma care and the advancement of research related to combat casualty care."

- DoD appreciates "the efforts of the Defense Health Board on this topic of great importance to its Service members."

November 2014: Board approved findings and recommendations

March 2015: The Defense Health Board's (DHB's) *Combat Trauma Lessons Learned from Military Operations of 2001-2013* Report submitted

October 2015: Received interim response from the Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight, stating they are working with the Services to revise policies and adopt recommendations

March 2016: Received final response from the Assistant Secretary of Defense for Health Affairs, stating two policies are in development: a policy for the Joint Trauma System Center of Excellence in the Department of Defense (DoD), and an update of guidance for Military Readiness Training

Lesson 1: Despite vast improvements in the military trauma care system over the past decade, there is no unifying agency with oversight over all aspects of the combat casualty care system.

Recommendation 1.1: Establish a senior level organization, such as the Defense Health Agency (DHA), as the lead agency for oversight of trauma care.

Recommendation 1.2: Establish the Joint Trauma System (JTS), in its role as the Department of Defense Trauma System (DoDTS), as the lead agency for trauma in DoD with authority to establish and assure best-practice trauma care guidelines to the Director of the DHA, the Services, and the Combatant Commanders.

Lesson 2: At the onset of the current conflicts, communication, coordination, and command and control of and among levels of care and personnel across the Services under Combatant Command control were not well coordinated, trained for, or implemented consistent with practices in civilian centers and systems.

Recommendation 2: Responsibilities of the Service Command:

a. Unit surgeons* or the medical advisor for the line commander shall be fully competent in the recommended professional and practice standards as promulgated by the proposed DoDTS (at the writing of this report, it would be the Tactical Combat Casualty Care (TCCC) Guidelines and DoDTS clinical practice guidelines (CPGs)).

b. Combatant Command Surgeons shall report their expectations, including evacuation times, CPGs, and integration to JTS and the DoD Trauma Registry (DoDTR).

*For example, a battalion surgeon.

Recommendation 3.3: DoD should continue to expand its partnerships with civilian trauma organizations to share information, preserve lessons learned, and improve trauma care. For example, a close partnership with a civilian medical center would help to ensure rapid stand up capability if necessary, and in peacetime, could allow for additional trauma experience, maintaining the skills and competency of military medical personnel.

Recommendation 3.4: DoD should ensure the sustainment of effective and targeted communication, distributing important combat casualty care information in a timely manner [such as the Committee on TCCC (CoTCCC) system in use at the publication of this report].

Lesson 4: In the context of trauma care, informatics equates to the use of electronic medical records (EMRs), which are vital to clinical care across the continuum and to performance improvement and research.

Recommendation 4: To establish a uniform registry that encompasses all aspects of trauma care, from the field to rehabilitation and to the degree possible, beyond rehabilitation to community reintegration, DoD should take the following actions:

a. Develop a high-fidelity online, tiered database as well as enhanced communications capability through all levels of care.

b. Increase research and development funding for new, automated live-patient tracking and identification, including biometrics.

Lesson 5: Ongoing improvement of outcomes for the combat wounded requires a robust ability to monitor the care rendered to combat casualties and to measure casualty outcomes as a function of the various elements of trauma care provided along the continuum in theaters of conflict. The Services are attempting to track and analyze outcomes, but compared to the Joint Theater Trauma System (JTTS)/JTS/DoDTS oversight of the same, there is significant opportunity to codify the PI process. Codifying the PI process will allow DoD to benchmark practices and outcomes and initiate near real-time corrective measures not possible outside the DoDTS today.

Recommendation 5.1: The DHB concurs with the recommendations of the *United States Military Joint Trauma System Assessment* listed below, and encourages DoD to act on these recommendations:

a. JTS should develop an overarching PI and Patient Safety Plan;

b. The PI and Patient Safety Plan should encompass a system-wide process for identifying events, taking corrective actions, monitoring, evaluating, and benchmarking;

c. As the lead agency for the system, JTS and the JTTS leadership in theater must possess the infrastructure and authority and systems accountability over the continuum of care for the PI process; and

d. A robust and system-wide informatics platform is needed to support the process.

Recommendation 5.2: DoD shall establish a formal and system-wide process for event identification and prioritization, determination of root causes, and development of possible countermeasures for PI. Such analysis and evaluation would improve the entire spectrum of trauma care and allow DoD to document casualty outcomes to demonstrate that the right care was provided under the right circumstances. Specifically, this requires the following:

a. Improved documentation including pre-hospital care and evacuation care and times.

b. Ongoing analysis of combat injuries to identify potentially preventable adverse events in conjunction with the AFMES.

c. Submission of timely and focused case reports from the unit level, prepared by field level personnel who are trained, resourced and designated as responsible and who have deployed with all medical units. These reports should be linked, in a timely manner, to the larger JTS.

d. Adherence to the cycle of PI including data acquisition, information analysis, and application of advances back into the larger trauma system.

Lesson 6: A robust PI system is required to link trauma training to patient outcomes and validate training methodology.

Recommendation 6: To ensure a systems approach to trauma training, DoD shall take the following actions:

a. Support the development of a formal link between the JTS and military medical training centers (e.g., Joint training centers, enlisted schoolhouses, Uniformed Services University of the Health Sciences (USUHS), medical proficiency training sites).

b. Provide military medical leaders with formal training in PI operations.

c. Ensure line commanders are aware of current casualty response system and best practice recommendations (such as those found on the JTS website at the time of this report).

Lesson 7: Medical and trauma knowledge must flow freely between the civilian and military medical communities and be coupled with rapid training integration strategies.

Recommendation 7: To standardize and harmonize trauma training across the Services, DoD shall take the following actions:

a. Sustain and expand initiatives to train and support all tactical evacuation medics to a common and high standard (at the writing of this report that standard would be Critical Care Flight Paramedics) (e.g., 160th Special Operations Aviation Regiment [Airborne] model, Air Force Special Operations Command model, newly implemented Army Medical Department model).

b. Develop an initiative to train and sustain combatant unit senior ground medics to a common and high standard.

Recommendation 7: To standardize and harmonize trauma training across the Services, DoD shall take the following actions (continued):

c.   Support the development of the CCAT and Center for the Sustainment of Trauma & Readiness Skills (C-STARS) by the Air Force for development of best practices and common standards for en route care.

d.   Review Service trauma training center programs (Army Trauma Training Centers, Navy Trauma Training Centers, C-STARS) and consider creating Joint Trauma Training Centers (JTTCs) making sure training occurs in a team based environment, ideally with a team that will deploy together.

e.   Ensure best practices and procedures are cross-leveled and standardized across all military medical simulation training centers (MSTCs), which should receive central certification.

f.   Ensure MSTC trainers are subject matter experts, regardless of military versus civilian status, and are trained to a standard, not to a time.

g.   Train military tactical evacuation (TACEVAC) personnel to, at a minimum, civilian critical care transport standards (see Recommendation 7c).

Lesson 8: **The lack of comprehensive, standardized training for military health care providers creates an operational gap that affects unit-level training as well as effective utilization of the military system to reduce combat mortality.**

Recommendation 8: The USUHS, as DoD's joint military medical school, shall take the following actions:

a. Continue to expand and institutionalize its direct participation, research, and training in trauma and combat casualty care delivery across Services and throughout the continuum of care.

b. Develop and formalize a partnership with the JTS.

c. Systematically train and develop clinical experts in prehospital battlefield care.

d. Involve the DHB Trauma and Injury Subcommittee in setting the curriculum.

e. Develop a trauma care curriculum that would be required by all health care providers before deployment.

Lesson 9: Effectively trained TCCC has a demonstrable effect on reducing potentially preventable causes of death on the battlefield.

Recommendation 9: TCCC shall continue to form the basis for battlefield trauma care and be integrated as the minimal accepted standard of training for all military members, initial enlisted medical training, and specialized enlisted medical training. In addition, TCCC sustainment training programs must occur on a regular basis, as the TCCC Guidelines are a "living" document and are regularly updated.

Lesson 14: **Commanders can only accept full responsibility for risk assumption or mitigation when they understand the inherent risk as well as their options as commanders to mitigate that risk. Medicine, medical, and medical training are terms conveying specialty training or education and have no tactical relevance. Accordingly, casualty response training for first responders and combatant leaders is often not incorporated into unit battle drills. This trauma training for leaders is an essential component of battlefield trauma care.**

Lesson 15: **Since the start of Operation ENDURING FREEDOM in 2001 and subsequently Operation IRAQI FREEDOM in 2003, numerous advances have been made in battlefield trauma care but more research is needed to fill critical gaps.**

Recommendation 15: To advance the trauma and injury research agenda, DoD shall take the following actions:

a. Continue to fill the research gaps remaining from the 2008 Guidance on Development of the Force.

b. Continue to support trauma care research during the interwar years in order to address existing TCCC gaps identified by the CoTCCC in the following areas:

   i. non-compressible hemorrhage.

   ii. hemostatic dressings and resuscitation strategies.

   iii. lyophilized plasma product.

   iv. fluid resuscitation.

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Recommendation 15: To advance the trauma and injury research agenda, DoD shall take the following actions (continued):

    v.   combat casualty care monitoring devices.

    vi. junctional hemorrhage control.

    vii. training and evaluation methods for TCCC skills.

    viii. airway management.

c.   Embed deployable research teams within deployed commands or deployed hospitals.

d.   Work to ensure a clinicopathological review of every U.S. combat fatality, including preventable death analyses from combat units.

e.   Support the continued use and analysis of the DoD Trauma Registry in order to identify areas of potential improvement and measurement of implemented mitigation strategies.

f.   Implement a transition initiative to procure, field, train, and track new TCCC devices and medications.

Recommendation 15: To advance the trauma and injury research agenda, DoD shall take the following actions (continued):

g. Establish an interagency mechanism with the Food and Drug Administration to approve proposed projects and indications for use by the Services in deployed combat environments.

h. Recommend the sustainment of the annual Military Medical Health Research Symposium, which is meant to link the clinical questions to the future funding.

Conclusions

In light of the publication of the National Academies of Science, Engineering and Medicine report, *A National Trauma Care System: Integrating Military and Civilian Trauma Systems to Achieve Zero Preventable Deaths After Injury*, the *Combat Trauma Lessons Learned from Military Operations of 2001-2013* report stands as a seminal body of work, which can be embraced and implemented across the entire Nation in conjunction with this larger endeavor.

Questions?