

# The Joint Trauma System: History in the Making

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The history of the Joint Trauma System (JTS) is rooted in the effort to improve combat casualty care. The JTS is a systematic and integrated approach to better organize and coordinate battlefield care to minimize morbidity and mortality and optimize the ability to provide essential care required for casualty injuries. The components of the JTS system include prevention, prehospital integration, education, leadership and communication, quality improvement/performance improvement, research, and information systems.

JTS visionary COL John B. Holcomb, the surgeon then commander of the US Army Institute for Surgical Research, is credited with seeing the tactical need, the operational need, and the strategic need to deploy a trauma system. Holcomb campaigned for this DoD trauma system to coordinate and manage the data collection efforts of the budding Joint Theater Trauma Registry (JTTR) initiative which called for a registry to capture the trauma care data. Medical care was being well documented in theater, but critical patient information was not readily available as a wounded member moved through multiple hospitals. At the time, deployed medical teams mostly relied on telephonic coordination of care for casualties transiting the evacuation system from point of injury back to the United States for definitive care.

The idea of a tri-service trauma system to manage the collection and use of the trauma care data came to Holcomb when he was deployed in the early years of the wars in Iraq and Afghanistan. In such austere locations, the absence of trauma experts and a trauma system was glaring.

“It was intimately clear as I went into Iraq in May 2003 and talked to young medics, forward operating bases, forward surgical teams, combat missions, and combat support hospitals and found there was absolutely no connection of anything to anybody – and I emphasize that,” said Holcomb. “There was no communication from prehospital providers to ground units or between the ground units and to Landstuhl where casualties were sent.”

Holcomb says the communication disconnect was so profound it was rumored the services’ Surgeons General got their information from *The Washington Post* since the publisher reportedly had a robust data collection and reporting system. The Surgeons General were essentially working in

“the dark.” They did not know who was receiving what operations much less what were the common injuries.

Holcomb also experienced the shortcomings of the first iteration of the effort to gather and record trauma care data using the JTTR, which at the time consisted of diverse paper forms that required validation before entry into a Microsoft Excel spreadsheet.

The revealing Iraq trip prompted Holcomb to recommend the Army Surgeon General to create a trauma care system. Holcomb and other trauma system proponents took the concept a step further by building the foundation under the U.S. Central Command to ensure global tri-service coverage before, during and after theater.

## BUILDING A TRAUMA REGISTRY FOR COMBAT CASUALTY CARE

The concept of collecting combat trauma care for gap and trend analysis was born from the 1996 U.S. General Accounting Office report which was drafted to address shortcomings identified from Operation Desert Storm, including:

“...shortcomings in DoD’s ability to provide adequate, timely medical support during contingencies and problems with the planning and execution of these efforts. The Joint Staff also identified problems with the current design of DoD’s wartime medical system. In response to these problems, DoD and the Services embarked on initiatives to correct shortfalls in wartime medical capabilities and improve medical readiness.”

“DoD is also trying to forecast the wartime medical demands in the year 2020 and design a military health services system (MHSS) that will be responsive to those demands (known as the MHSS 2020 Project).”<sup>1</sup>

The Combat Trauma Surgery Committee, chartered under the Defense Medical Readiness and Training Institute, was formed in 1996 to identify minimal essential task lists and to develop a joint Emergency War Surgery Course and a trauma registry.<sup>2</sup>

In 2002, the JTTR was approved as a demonstration project by MG Kevin Kiley, 41st Surgeon General of the U.S. Army and commander of the U.S. Army Medical Command. Limited data collection began at Landstuhl with support from the 3rd MEDCOM staff in theater. A field version was delivered to the units. Within a year, LTC Brian Eastridge was moved from his assignment in Mosul to become the first deployed CENTCOM Theater Trauma Medical Director of

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the Joint Theater Trauma System (JTTS) which managed the initial efforts to collect trauma data in theater.

In 2004, the Assistant Secretary of Defense, Health Affairs (HA) officially directed all services' (Army, Air Force, Navy) Medical Departments to work together to establish a single centralized trauma registry.<sup>3</sup> The mandate was to collect and aggregate combat casualty care epidemiology, treatments, and outcomes essential to understanding the challenges, successes, and failures that the military medical corps faced in providing effective and timely care for combat casualties. The resulting demonstration registry known then as the Combat Trauma Registry (CTR) was constructed by the Center for AMEDD Strategic Studies (CASS), with trauma-related information initially abstracted into it from paper medical records received from trauma nurse coordinators (TNCs) at Landstuhl Regional Medical Center (LRMC). The HA memo identified the requirement to implement the Theater Trauma Records, which are the trauma patient Physician History and Physical form and Nursing Record. The registry was intended to receive and share these data. This memo documented an expectation that data elements would be collected electronically through the Composite Health Care System (CHCS) II/IIT by CY 2008. Shortly after the demonstration program started, the Army Surgeon General approved its transition to an operational mode, leading to the formation of the CENTCOM JTTS and, eventually, the San Antonio-based JTS.

The original JTTR Excel spreadsheets evolved into an Access database. This next generation JTTR was standalone software, Store & Forward (S&F), and designed to standardize data collection. The S&F was loaded on a laptop assigned to trauma nurse coordinators selected from each Service and trained by the JTS staff. Different versions of JTTR were used in different places. Excel was in theater, ACCESS was in LRMC and a homegrown version at the Center for Army Medical Department Strategic Studies at Fort Sam Houston, San Antonio. Specially trained trauma coordinators were deployed to Role 1 through CONUS Role 4 – from forward operating bases and military treatment facilities in Iraq, Afghanistan, Germany, and to military treatment facilities in the USA.

There was joint service participation in the JTTR initiative. A Theater Trauma Medical Director and Theater Trauma Nurse Coordinators were rotated from each service and integrated into the theater operation to facilitate improvements in capabilities. The JTTR, for hosting all trauma-related data, was utilized to facilitate performance improvement, utilization of resources and provide command level information to the battlefield.

To date, more than 400 data points are captured on each casualty in the DoDTR using paper and/or electronic records. Sources of data include, but are not limited to, patient care reports (PCRs), after action reports (AARs), facility medical records, Defense Enrollment Eligibility Reporting System (DEERS), Theater Medical Data Store

(TMDS), Patient Administration Systems and Biostatistics Activity (PASBA), and TRANSCOM Regulating and Command & Control Evaluation System (TRAC2ES). Data are abstracted, when possible, for the entire continuum of acute care (i.e. care in the field through care rendered at Role 4 MTFs in the continental U.S.). Currently, the main registry has over 80,000 distinct injury events and more than 131,000 trauma records that can potentially be used to better understand the burden of injury, morbidity, and mortality.

## ESTABLISHING THE TRAUMA CARE SYSTEM TO SUPPORT THE REGISTRY

October 2006 marked a historical milestone for the JTS when the JTTS was formally stood up. Abstraction and IT teams were created in the U.S. Army Institute of Surgical Research (USAISR). Dr Mary Ann Spott, a national expert in trauma systems and trauma registries, was hired in 2006 to be the first JTS Director, to perform an assessment of the JTTR as it then existed. Many software and process issues were identified and an update to the JTTR homegrown software was recommended. The team began to collect performance improvement indicators on Excel spreadsheets in theater in order to capture clinical outcomes.

The JTTS was modeled after the civilian trauma system principles outlined in the American College of Surgeons Committee on *Trauma Resources for the Optimal Care of the Trauma Patient*, 2006.<sup>4</sup> The document identifies trauma care resources and practices for the optimization of standards of care, policies, procedures, and protocols for both prehospital and hospital personnel. Additionally, it identifies and integrates processes and procedures to record trauma patient-related data at all levels of care for continual process improvement.

The following years formalized the JTS operations.

- USAISR hired additional staff to perform specialized data abstraction and analysis to support the JTTS team in San Antonio.
- The construction of a Secure Internet Protocol Router Network room at the USAISR opened new opportunities with the capability to analyze classified and nonclassified data.
- JTS added a clinical operations component and the Education branch for training and accreditation.
- The deployed CENTCOM JTTS teams added data capture sites.
- Military trauma care experts drafted the first standardized clinical practice guidelines for combat trauma.
- The *JTS Military Trauma Systems Manual*, which outlines the JTS operations and JTTS support, was published.
- The Committee of Tactical Combat Casualty Care (TCCC) joined the JTS. TCCC is a set of evidence-based, best practice, prehospital trauma care guidelines customized for use on the battlefield.
- A new and improved JTTR S&F and web versions is released, eliminating the Excel spreadsheets in Iraq and

Afghanistan, the CASS version, and the Access database in LRMC.

### THE JTTS TRANSITIONS TO THE JTS

2010 was an eventful year in which decisions by key leaders broadened the JTS scope of operations. CENTCOM named JTS as a consultant to that COCOM, the intent being that whenever a war, natural disaster needing trauma oversight, etc., the COCOM would institute a JTTS team that would be trained by and collaborate with the San Antonio-based JTS. CENTCOM also committed to providing new positions to supplement the in theater team with MEDEVAC staff and JTTS owned NCO staff. To maintain momentum with the CENTCOM reinforcements, JTS added Prehospital and MEDEVAC sections. Today the JTS now spans several geographic combatant commands including CENTCOM, European Command, and Pacific Command.

On March 25, 2010, Surgeon General of the US Army LTG Eric Schoemaker named JTS as a directorate of USAISR. The JTTS is renamed the JTS to signify operations beyond deployment and outside theater.

In 2011,<sup>5</sup> the S&F JTTR product was revamped and launched as a robust, real-time, web-accessible system known as DoD Trauma Registry (DoDTR). An S&F version was maintained to provide trauma coordinators with data collection capabilities in austere environments.

The pace again picked up for the JTS when in 2013 The Office of the Assistant Secretary of Defense designated JTS was the Department of Defense Center of Excellence (DCoE) for Trauma, the first DCoE to earn this distinction without creation by Congressional mandate.<sup>6</sup> The Center of Excellence recognition is awarded to organizations which create value by achieving improvement in outcomes through clinical, educational, and research activities.

The Defense Health Agency (DHA) began to turn its attention to the JTS as the Military Health System began to evaluate how it can increase trauma medical readiness. The Defense Health Board directly pointed to the JTS and DoD Trauma Registry in its Mar 9, 2015 Combat Trauma Lessons Learned from Military Operations of 2001–2013 report<sup>7</sup> as the potential for advancing medical readiness and trauma care gap analysis.

DHA acted on the Lessons Learned advice and cemented the recommendations in the Department of Defense Instruction (DoDI) 6040.47 released September 28, 2016.<sup>8</sup> In the DoDI, the Office of the Under Secretary of Defense for Personnel and Readiness recommends the DoD “establish the JTS, in its role as the Department of Defense Trauma System as the lead agency for trauma in DoD with authority to establish and assure best practice trauma care guidelines to the Director of the Defense Health Agency, the Services, and the Combatant Commanders.”

December 23, 2016 marked a new era for the JTS when the National Defense Authorization Act (NDAA) for Fiscal Year 2017 directed the establishing of the JTS as the integral

trauma care component in the Military Health System.<sup>9</sup> The NDAA and the DoDI elevated JTS’ status within the Military Health System and moved it from the Army to DHA, making it formally a joint organization in name, purpose, and administrative alignment.

The DoD Instruction (DoDI) 1322.24, released on March 16, 2018, mandated TCCC as the standard for all prehospital medical care across the DoD.<sup>10</sup> The directive prioritizes TCCC training over traditional combat medic training, expanding the role of JTS in medical readiness.

The JTS mission aligns with DoD Policy. JTS has the ability to leverage trauma care data to standardize and facilitate performance improvement. JTS has close working relationships with civilian and military trauma subject matter experts who recommend best practices in clinical practice guidelines.

In truth, JTS has already achieved most of the functional requirements listed by the DHB. Today, JTS:

- Enables accurate and timely entry of casualty and trauma care data into the DoDTR or current DoD system of record.
- Develops, assesses, and recommends best practices in treating traumatic injuries, including clinical practice guidance and TCCC Guidelines adapted to the medical mission requirements.
- Assists in identifying trauma care-related requirements for education and training, research, informatics, and operations.
- Supports the timely reporting of casualty care and trauma-related metrics.

To fulfill its new overarching role, JTS recently expanded its epidemiology/data analysis team, and added two new committees, the Committee for En Route Combat Casualty Care and the Committee for Surgical Combat Casualty Care. Development of new specialty DoD Trauma Registry modules for traumatic brain injury, en route care, military working dog and Role 2 will enhance performance improvement initiatives and gap analyses for medical capabilities to direct ongoing and future combat casualty care research, trauma skills training, and direct combat casualty care.

During 2016–2017, the JTS participated in the zero-based budget review (ZBR) process which was to identify redundant, overlapping, and unnecessary trauma-related registries. The final decision has yet to be announced, however, the expectation is that several registries identified as trauma-related will integrate in to JTS’ DoDTR. In anticipation of the additional medical/trauma specialty registries integrating to DoDTR, JTS has begun analyzing the impact to resources and planning for the DoDTR expansion. Simultaneously with the ZBR effort, JTS was identified as a directorate to move from U.S. Army Medical Materiel Command to DHA in August 2018.<sup>9</sup>

Today JTS builds on its original mission to minimize morbidity and mortality to provide an incomparable system of integrated processes, products, training and education programs, performance improvement analysis, combat committees to

provide an accessible fully encompassing system providing support to ensure combat medical readiness globally.

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