



A PREHOSPITAL TRAUMA REGISTRY FOR TACTICAL COMBAT CASUALTY CARE

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ABSTRACT

Many combat-related deaths occur in the prehospital environment before the casualty reaches a medical treatment facility. The tenets of Tactical Combat Casualty Care (TCCC) were published in 1996 and integrated throughout the 75th Ranger Regiment in 1999. In order to validate and refine TCCC protocols and procedures, a prehospital trauma registry was developed and maintained. The application of TCCC, in conjunction with validation and refinement of TCCC through feedback from a prehospital trauma registry, has translated to an increase in survivability on the battlefield.

Historically, many combat-related deaths occur in the prehospital environment before the casualty reaches a medical treatment facility.¹ In 1996, Butler and colleagues outlined a novel approach to prehospital trauma management that would optimize casualty care in unique environments and circumstances encountered during combat operations.²

The 75th Ranger Regiment adopted and integrated the principles of Tactical Combat Casualty Care (TCCC) in 1999. Because all personnel on the battlefield have the potential to provide casualty care as first responders, and also have the potential to be a casualty, the 75th Ranger Regiment provided TCCC training to all personnel assigned to the unit. The Ranger First Responder Course and the Casualty Response Training for Ranger Leaders Course were 2 TCCC-based programs of instruction developed and implemented at that time to ensure a mastery of the basics of TCCC by all Rangers.³ Additionally, the Regiment integrated the principles of TCCC in the same manner as a battle drill during the conduct of training exercises and rehearsals for combat raids and air-field seizures.

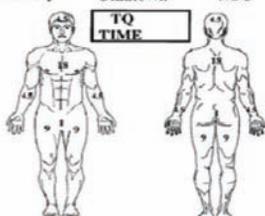
Documentation of prehospital care provides a historical record of the event on behalf of the patient and communicates patient status, injuries, and treatments as patients flow from provider to provider on the battlefield. Documentation of injuries and prehospital treatment is also required to validate and refine TCCC protocols and procedures. Although the DD Form 1380 (Field Medical Card) was the standard for military prehospital care documentation at that time, it did not adequately capture the necessary data fields imposed by TCCC. Thus, also in 1999, the 75th Ranger Regiment developed a casualty card to capture and document TCCC in the prehospital environment. This card quickly propagated throughout the U.S. Special Operations Command and was used by multiple units in both Afghanistan and Iraq. Most recently (2009), this card, shown in the Figure, was adopted by the U.S. Army as DA Form 7656, Tactical Combat Casualty Care Card.

Once again, as all personnel on the battlefield have the potential to be first responders, TCCC equipment and supplies must be considered to be "Soldier-centric" and should be commensurate with ability, skills, and training. Thus, in 2000, basic TCCC bleeder control kits were provided to all Rangers and were carried in a standard-

ized fashion and location to facilitate rapid self or buddy care, while medics carried additional medical equipment and supplies for more advanced care. It should be noted that the Ranger bleeder control kit subsequently became a model for the Army's current individual first aid kit.

As first responders were ultimately providing casualty care, and at times found themselves in combat formations that did not include a medic, responsibility for documentation of this care was shifted away from the medic only to all Soldiers, in contrast to the Field Medical Card traditionally carried solely by the medic. Thus, Ranger casualty cards became ubiquitous and were included in all bleeder control kits. As such, they were collocated with all potential first responders as well as all potential casualties.

Prompted by the events of September 11, 2001, components of the 75th Ranger Regiment deployed to combat in Afghanistan the following month. Concurrently, the 75th Ranger Regiment initiated a casualty card collection program in order to capture and evaluate data on combat casualties and casualty treatments. The casualty card collection program expanded to Iraq in March 2003 as components of the 75th Ranger Regiment also deployed in support of combat operations in that theater.

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DA FORM 7656

The Tactical Combat Casualty Care Card, DA Form 7656.

Although initially a rudimentary database in its nature, the casualty card collection program evolved into a prehospital trauma registry (PHTR) in 2005 using the Ranger casualty card as the template for the registry. Post hoc PHTR casualty card entry removed battlefield chaos and ensured increased capture and granularity of injuries incurred and treatments provided. Command emphasis and support of the PHTR was instrumental to its success. Leaders viewed the casualty card collection program and PHTR as a means to answer questions in reference to personal protective equipment as well as tactics, techniques, and procedures. Lessons learned were rapidly dispersed internally throughout the organization and externally to other units. Integral to gaining and maintaining command support for the PHTR were the integration and front loading of instant data graphing products, command reports, and ad hoc query capabilities into the PHTR. Notable is that the PHTR significantly increased the success of the casualty card collection program. Also of note, utilizing the casualty card in isolation would not have adequately provided the purpose, justification, and feedback required to maintain strong command support for the program.

The purpose of the PHTR was to collect combat point-of-injury data at near-real time and provide timely command-level data, statistics, trends, and analysis. Thus from 2008 to 2010, in consultation with the U.S. Army Institute of Surgical Research and in collaboration with the Texas A&M Health Science Center Rural and Community Health Institute, the framework and power of the PHTR was further refined as medics and computer programmers worked side-by-side to develop a product that would benefit the command. The resulting PHTR is a web-based solution specifically developed in order to validate TCCC training and treatment protocols through an internal assessment and analysis of casualty wounding patterns and treatments rendered. This analysis would determine if appropriate interventions were conducted on casualties who needed them, if there was a lack of appropriate interventions on casualties who needed them, and if inappropriate interventions were conducted on casualties who did not need them. Ultimately, the analysis would also help to facilitate 5 major goals:

1. Augment the commander's decision-making process.
2. Reduce morbidity and mortality through force protection modifications and directed procurement.
3. Validate and refine the commander's casualty response system.
4. Evaluate current Tactical Combat Casualty Care treatment strategies.
5. Guide needed modifications to unit medical and nonmedical personnel, training, and equipment requirements.

Requirements for point-of-injury, tactical, and level 1 care and documentation must reflect the fact that the current flow of casualty care is no longer based on strict adherence to historical echelons of care. Proposed technological solutions cannot detract from the combat mission, hinder combat casualty care, or put a task force at risk. Material solutions must remain simple, durable, redundant, and ubiquitous. Solutions must also be Soldier-centric and not medic-centric, as all Soldiers have the potential to be first responders.

As TCCC implementation is the responsibility of tactical leaders, it is a "casualty response system" and not a "medical system." Providing timely feedback to tactical leaders is a must in order to affect needed changes in tactical force protection and procurement

requirements, TCCC treatment strategies, and resourcing of personnel-training equipment.

The 75th Ranger Regiment has been continuously engaged in combat operations throughout the past nine years. As such, the Regiment has maintained a constant presence in Afghanistan since 2001 and Iraq since 2003. The Ranger casualty card and PHTR have been successfully used in both theaters throughout this time. As of April 1, 2010, the Regiment had sustained a total of 419 battle injuries, including 28 who were killed in action and 4 who died of wounds. None of these fallen Rangers passed away as a result of prehospital medically preventable causes.

Tactical Combat Casualty Care must be measured, validated, and refined through a functional PHTR that provides evidence-based support for casualty care protocols, procedures, and training. Documentation of injuries and treatments in the prehospital environment has proven instrumental in the continuous refinement and improvement of TCCC treatment strategies at the unit level. Point-of-injury and prehospital wounding and treatment data captured by the PHTR can also be linked to patient outcomes maintained at the Joint Theater Trauma Registry for optimal analysis of the entire provided continuum of care. Innovation and advancement of casualty care on the battlefield is facilitated by a care delivery system with a data repository, which is available for data mining by investigators and researchers.

Ultimately, TCCC is not just a medical program; it is the framework of a casualty response system that relies on a mastery and immediate application of basic and vital lifesaving skills by all Soldiers. This is validated by a PHTR. The success of TCCC is directly related to command ownership of the program. The tactical commander owns and is responsible for the prehospital casualty response system, and all personnel in the command serve as the foundation for prehospital care on the battlefield. TCCC provides the critical protocols and procedures necessary for Soldiers to treat a casualty. Leaders ensure this training is conducted to standards and is rehearsed and integrated into training events throughout the training cycle. The PHTR continuously validates and refines TCCC. The end result is an increase in survivability on the battlefield and a successful completion of the mission.

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