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*Dedicated to the
Indomitable Spirit
and Sacrifices of
the SOF Medic*

Committee for Tactical Emergency Casualty Care *Spring Update*

Geoff Shapiro, EMT-P; Reed Smith, MD; David W. Callaway, MD

General Updates

Since the last Committee for Tactical Emergency Casualty Care (C-TECC) quarterly update, the world has witnessed the complex, but not unpredicted, attacks in Paris, France, and San Bernardino, California. The threat of dynamic, active, violent incidents is unfortunately the “new normal.” The C-TECC remains focused on assimilating the best medical science and operational principles from the US military experience, the international civilian response, and our domestic leaders to provide trauma care guidelines that minimize potentially preventable mortality.

C-TECC members remain actively involved as Inter-agency Planning Group and faculty members for the ongoing Joint Counter Terrorism Awareness Workshop Series (JCTAWS). The Department of Homeland Security Federal Emergency Management Agency (FEMA), National Counter Terrorism Center (NCTC), and the Federal Bureau of Investigation (FBI) sponsor JCTAWS and work with local jurisdictions to develop and mature plans for preventing, preparing for, and responding to complex attack scenarios on US soil. TECC remains prominently featured within the workshop, and has been included as a key tenant for providing point-of-wounding care by all providers throughout the trauma chain of survival and continuum of care. This includes appropriate interventions by first care providers, non-medical first responders, medical first responders, and first receivers.

The Chicago JCTAWS was conducted three days after the latest Paris attacks, and the scenario for the workshop was eerily similar to actual events in Paris despite being developed months in advance. San Diego, California hosted a workshop in February, and St. Louis, Missouri in March. Other workshops in Dallas, Texas and Tampa, Florida are in the planning stages. C-TECC membership involvement in JCTAWS continues to allow for best practices to be learned and shared between varied communities, and informs C-TECC as to the continued need to cultivate capabilities throughout the nation.

A second national-level initiative focusing on response to complex attack scenarios is the Integrated Emergency Management Course—Complex Coordinated Attack (IEMC-CCA) sponsored by FEMA through its Office of Counter Terrorism & Security Preparedness (OCSP) and Emergency Management Institute (EMI). Delivered at the EMI facility in Emmitsburg, Maryland, or locally through a mobile training team, IEMCs are an expanded format based on the concepts of JCTAWS that allow for more instruction and discussion during the course. Since the last C-TECC update, IEMCs have been delivered in Cleveland, Ohio (in preparation for the Republican National Convention) and Norman, Oklahoma.

International adaptation of TECC also continues. C-TECC members have worked with nongovernmental organizations to support TECC training through US Department of State-funded training in El Salvador. Other entities from France and the United Kingdom have also adapted and integrated TECC into their programs.

C-TECC members have been and will be featured at a number of recent or upcoming major conferences to include the National Association of State EMS Officials (NASEMSO), National Association of EMS Physicians (NAEMSP), Eastern Association for the Surgery of Trauma (EAST), American College of Emergency Physicians (ACEP), and EMS Today. TECC continues to be integrated into various operational and trauma care practice areas and has significantly impacted development of emerging initiatives on active violent response.

Research Updates: The Pattern of Wounding in Active Shooter Fatalities

The incidence and severity of civilian public mass shootings (CPMS) have continued to rise. Over the past 3 years, driven in large part by the 2012 mass shooting in Newtown, Connecticut, there has been focus on improving survival in active shooter events. Recently, several large, public initiatives have concentrated their efforts to address loss of life through strong, unidirectional

messaging on external hemorrhage control with a special emphasis on the use of extremity tourniquets. This guidance is driven by the combat wounding pattern and medical lessons learned from past military action where 9% of deaths have been due to extremity hemorrhage and the overall case-fatality rate is less than 10%.¹ However, to have an informed basis on which to adopt military combat medical response algorithms for civilian active shooter incidents, there must be evidence that supports the premise that military and civilian wounding patterns and injuries are similar.

There seems to be ready acceptance in the prehospital and trauma medical community of the assumption that, despite obvious operational differences, the wounding patterns, fatal injury, and required prehospital medical interventions are similar between combat and civilian public mass shootings. However, although the tissue physiology of ballistic wounding and the resulting systemic physiologic response is the same, almost everything else is different (e.g., age of victims, use of ballistic protection, comorbidities). Thus, directed medical interventions following civilian mass shootings may require a different overall strategy and therapeutic emphasis than that from combat to decrease the number of potentially preventable deaths.

Over the past 2 years, C-TECC cochair E. Reed Smith, executive committee member Geoff Shapiro, and Board of Directors member Babak Sarani have been conducting a review of requested official autopsies and medical director reports from civilian public mass shootings between 1983 and 2013, working with the hypothesis that fatal wounding in civilian active shooter events differs from combat and thus may require different therapeutic emphasis. Although limited by many barriers to accessing the autopsies, through Freedom of Information Act requests, the authors were able to obtain 139 autopsy/medical examiner reports from 12 different CPMS events.

This is the first study that specifically examines the overall wounding, the fatal wounding, and the incidence of potentially survivable wounds following civilian public mass shootings. The study goal was to gain perspective on civilian fatalities in the same manner that Eastridge et al.² did for the modern battlefield in 2010. Comparing the results of the civilian autopsies with the results from the combat deaths reported by Eastridge and co-workers, it is clear that fatalities following CPMS differ from combat fatalities in the mechanism of injury, overall wounding pattern, the fatal wounding pattern, and the percentage of potentially survivable injuries. Some of the results of the civilian data were as follows:

- All wounds were due to gunshots (versus approximately 80% blast and 20% gunshots in combat)

- Average of 2.7 gunshots per victim
- The case-fatality rate for CPMS was significantly higher than that for combat (44.6% versus 9.11%)
- Only 20% of overall wounds were to the extremities (64% in combat)
- The site of fatal wounding was to the head or chest in 75% of cases (61% in combat)
- Only 7% of fatalities were found to have potentially survivable wounds. This is significantly lower than the reported 24% in combat
- The most common site of potentially survivable injury was the chest (89%), not the extremity, as in combat.
- In the study population, there were no deaths due to exsanguination from an extremity, thus no deaths that could have potentially been prevented with the use of a tourniquet or external hemorrhage control.

The conclusion from this initial study of civilian active shooter wounding patterns confirms what is relative common sense. Because of the operational and population-based differences between civilian events and military combat, the overall wounding and fatal wounding patterns are different than in combat. Does the fact that in the study population there were no deaths that could have been prevented with a tourniquet imply that tourniquets/external hemorrhage control in CPMS events are unimportant? Emphatically no! Tourniquets and simple hemorrhage control measures most definitely have a role in improving survival but should no longer be the sole emphatic focus of national initiatives and first responder and public education.

The study results indicate that chest injury, by far, is the most common, potentially survivable wound. As a result, a systematic approach that promotes not just hemorrhage control but the entire spectrum of civilian TECC, adjusted to the scope of the provider, may improve survival. Per TECC, in addition to immediate patient access and external hemorrhage control (direct pressure, tourniquets, and hemostatic agents), immediate medical care in the wake of a public mass shooting must include strategies to prevent further injury to the wounded, simple airway management, recognition and management of declining respiratory function as a result of penetrating trauma to the chest, proper positioning of the casualty, efficient movement of the casualty, and prevention of hypothermia.³ Simple training with that breadth of knowledge, along with improved operational procedures to facilitate both rapid access to the wounded for medical first responders and rapid extrication to definitive care, will likely have the most mortality benefit for the few casualties with potentially survivable but severe injuries following the next CPMS event.

This study has been accepted for publication in the *Journal of Trauma and Acute Care Surgery* and the implications

on TECC will be further discussed at the May 2016 full committee meeting at the Special Operations Medical Association Scientific Assembly (SOMSA).

Committee Business

The Texas State University Advanced Law Enforcement Rapid Response Training (ALERRT) program hosted the November 2015 C-TECC meeting in San Marcos, Texas. The meeting primarily focused on identifying update areas, accessibility, and formatting of the existing TECC guidelines. Working groups were established to begin templating tiered recommendations for skill sets and trainings based upon the TECC Chain of Survival Model and the Whole of Community approach to TECC integration, as recently articulated by Fisher et al.⁴ These recommendations will be presented for review at the May 2016 C-TECC Meeting in Charlotte, North Carolina.

Guideline Recommendations

The C-TECC trauma Chain of Survival has been broadly endorsed as an effective policy and training tool for whole-community integration of TECC. A key component of this program is the first care provider (FCP). The FCP Working Group, led by Dr Bobko, has helped to drive research, publications, and public policy discussion on the topic of FCP.^{5,6} Recently, the group published recommendations in JSOM and the *Journal of Trauma*. In summary, as noted in the original 2011 TECC guidelines, appropriately trained and equipped, the FCP can be the first link in the trauma chain of survival. Public safety and first response agencies should acknowledge this operational reality and should lead the effort to integrate the FCP into whole-community crisis response plans built upon the tiered application of the civilian TECC medical guidelines. The C-TECC Working Groups are also drafting recommendations for nonmedical first responders and basic life support providers. These recommendations will be discussed and voted on at the 22 May 2016 meeting at SOMSA.

Tentative 2016 May Schedule

Given recent research by Dr Reed Smith, Dr Babak Sarani, and Mr Geoff Shapiro, presented at the January 2016 EAST conference in San Antonio, Texas, suggesting that torso and truncal trauma result in the majority of active shooter incident-related mortality, the C-TECC meeting will focus on strategies to address this complex trauma management challenge. Further discussion on this topic and how to continue to influence and support efforts such as the White House “Stop the Bleed” campaign and Hartford Consensus will be on the agenda.

The C-TECC appreciates the ongoing support and partnership of the InterAgency Board, FEMA, National Tactical Officers Association, Special Operations Medical Association, and the ALERRT team.

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