Committee for Tactical Emergency Casualty Care (C-TECC) Update: Fall 2014

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JUNE 2014 TECC GUIDELINES COMMITTEE MEETING

The Johns Hopkins Center for Law Enforcement Medicine and Division of Special Operations in Baltimore generously hosted the June 2014 Committee for Tactical Emergency Casualty Care meeting (C-TECC). The C-TECC meeting focused on several critical issues including guideline updates, review of C-TECC member involvement in recent federal efforts regarding active violent incidents, examination of national best practices, and new partnership agreements.

Guideline Updates

Updated language will be added to www.c-tecc.org.

Vented Chest Seals

Recently, based on two laboratory animal trials (Evidence Level C), the CoTCCC changed the recommendations for management of open pneumothorax/penetrating chest trauma to emphasize the use of vented chest seals. In their study, Kotora et al. created a surgical thoracostomy, sealed the hole, and then infused a combination of air and blood into the chest cavity. The study found that the HyFin, Sentinel, and SAM chest seals all effectively prevented development of tension physiology.[1] A second laboratory animal trial by Kheirabadi et al. demonstrated that violation of the chest wall created immediate respiratory distress (presumably be eliminating the negative pressure gradient required for proper respiration). Occlusion of the hole immediately restored normal respiratory mechanics. However, serial air injections resulted in tension physiology in models with nonvented chest seals. Vented chest seals prevented this outcome.[2] Based on these two trials, the C-TECC has added language to include the use of vented chest seals if available. Unlike CoTCCC, C-TECC guidelines committee did not believe that clear superiority in terms of clinical outcome with vented versus nonvented chest seals with a comprehensive decompression strategy. In the civilian setting, with relatively short transport times, the likelihood of developing a fatal tension pneumothorax remains rare, even in cases of penetrating chest trauma. If an agency is using occlusive chest seals, C-TECC recommends the employment of a tiered strategy for chest decompression that includes techniques such as needle decompression, burping of the wound, or, rarely (and with proper protection and training), finger thoracostomy. Standard emergency medical services (EMS) practice already accounts for most of these changes, so existing protocols based on the National Education Standards do not necessarily need to be updated. If an agency is considering developing a new standard operating procedure for management of penetrating chest trauma or updating equipment stocks, vented chest seals likely offer some clinical advantage without a significant difference in cost.

Penetrating Eye Injuries

Given the infrequency of eye injuries, the availability of rapid access to emergency medicine or ophthalmology specialists, and member input on existing civilian protocols, the C-TECC has simplified recommendations for eye injury management. During the public comment period, several guests questioned the utility of field visual acuity tests in the civilian setting. In most situations, people thought that this simply added time to the evacuation and provided little additional clinical information. New recommendations call for simply protecting the eye from external pressure and stabilizing the object (if present). As with all recommendations, the tactical and operational scenario should inform clinical decisions.

Pediatric Populations

While jurisdictions across the county and internationally are racing to improve their response to Active Violence Incidents (AVIs), there has been a long-standing lack of guidance with respect to treatment of nontraditional populations. While AVIs should not dominate guidance on trauma care, increased awareness of these events provides an opportunity to drive a paradigm shift in the prehospital treatment of these patients. Within the past 2 years, events involving public locations (e.g., schools, churches, and theaters) have attracted the attention of the national media. Most, if not all, have involved pediatric casualties. In 2013, the C-TECC formally stood

up the Pediatric Working Group (PWG) and, in 2013, *JSOM* published the first set of high-threat response guidelines for pediatric victims. Further evaluation has identified the need for improved first responder interaction with pediatric victims during crisis as well as postevent management. Adopting research from the Child Life Specialist literature, the C-TECC voted to add language to the Pediatric Appendix that addresses techniques for streamlining operations with children, as well as improving postevent care during evacuation phase. The addenda recommend provision of a single point of communication with children, as well as establishment of some form of "child-friendly" space during the evacuation phase. Identifying this critical gap in prehospital care will help improve both familiarity and predictability for children and families and were considered to have both clinical and operational importance.

Ongoing Working Groups

Psychological threat mitigation: Work continues toward developing guidelines aimed at best preparing responders for both the expected and potential psychological fallout that may result when responding to critical incidents. Stakeholders and subject matter experts are being organized to look at how current understanding of acute stress response and posttraumatic stress disorder can be applied to improve responder readiness and resiliency as well as minimize effect from psychological trauma both during and after an event. This effort is coinciding with a recently released publication from the IACP titled "Breaking the Silence on Law Enforcement Suicides." This document offers that the most important objective is the deployment of a "mental wellness and suicide prevention programs in police departments across America." There is also concomitant work by the IAFF via task force in multiple cities aimed at developing wellness initiatives. The C-TECC hopes to identify any operational strategies (e.g., limiting unnecessary exposure to mortally wounded victims) that may mitigate subsequent first responder psychological crisis.

First care provider (FCP) education: As identified in the 2014 FBI active shooter report, the majority of the time the shooter has done his or her damage before first responders arrive. At every major incident since 2008, a community member has been the first to care for the injured. Since 2012, the C-TECC membership has been working with a variety of national, regional, and local agencies to define this population as EMS-extenders and expand the spectrum of EMS response. Accordingly, developing principles to build community resilience in the face of active violent incidents has become a primary focus of the C-TECC. Founded on a basic understanding of risk, techniques for addressing potentially preventable mortality (e.g., tourniquet application) and creation of common language to interact with professional first responders, this work will improve community response to these horrendous incidents. C-TECC members are currently involved in initiatives such as School Casualty Care in South Carolina and support for the innovative educator training in Duvall Kings County, Washington.

Training

FEMA Technical Assistance (TA) Program: Tactical Emergency Casualty Care

The FEMA Office of Counterterrorism and Security Preparedness continues to support the national roll out of TECC with three additional FEMA TA programs in the second half of 2014. Chicago, Boston, and San Diego will host the final FEMA TECC TA programs of 2014. The Chicago Police Department SWAT Team in conjunction with Northwestern Memorial Hospital will be hosting a TECC TA in late August 2014. In attendance will be representatives from Chicago Police Department, Chicago Fire Department, Northwestern Memorial Hospital, Illinois Region XI EMS System, City Colleges of Chicago, Chicago Office of Emergency Management and Communication, and numerous suburban police and fire agencies. Northwestern Memorial Hospital has graciously offered to host this training at the Northwestern University Feinberg School of Medicine. The Boston TECC TA will be hosted by Boston EMS for the Metro-Boston Security Region the first part of September. Please contact agency representatives in Chicago, Boston, or San Diego if you would like more information. Further, if you are interested in hosting a future TECC TA, C-TECC should be contacted via our updated website to begin the process.

TECC in Action

Jurisdictions and agencies throughout the world continue to incorporate TECC as part of their response to high-threat incident protocol and models. Members of C-TECC were fortunate to attend a full-scale exercise in London, England, where the London Fire Brigade, Metropolitan Police Department (Scotland Yard), and London Ambulance Service practiced and demonstrated their program for dealing with AVIs, marauding attacks, and fire as a weapon. Dr Reed Smith delivered a briefing that highlighted additional areas of inclusion for TECC for those agencies.

At the June C-TECC meeting, Christopher Baldini, Fire Paramedic Captain at the Philadelphia Fire Department, described the "Rapid Assessment Medical Support (RAMS)" program that has recently been operationalized in Philadelphia. This program is an example of nontactical EMS providers being trained to provide TECC interventions in indirect threat/warm zones while being escorted and provided force protection by law

enforcement personnel. RAMS was carefully developed by members of the Philadelphia Police Department and Philadelphia Fire Department. Other jurisdictions in the greater Philadelphia Metropolitan Area have also developed other escorted warm zone care programs for high-threat incidents.

Also at the June meeting, Ofer Lichtman, of the Rancho Cucamonga, California Fire Department, briefed the Recue Task Force program that was implemented in his jurisdiction. Even though their RTF program is similar to others and allows for non-TEMS fire department personnel to be escorted by law enforcement into indirect threat/warm zones, several adaptations and lessons learned by their personnel were presented.

The Bentonville, Arkansas Fire Department hosted a week-long TECC training program in March that was developed for various members of their city's first response community, as well as first care providers in schools and corporate/business entities. This TECC training program was part of their Rescue Task Force development process and included a Train-the-Trainer session that has enabled Bentonville to continue to train their community.

Recognized Training Content

The FY 2013 Homeland Security Grant Program (HSGP) Funding Opportunity (FOA) under the FOA number DHS-13-GPD-067-000-01 under priority number 5, specifically encourages first responders to "apply funding in support of efforts to improve mass casualty care capabilities with a specific focus on providing immediate emergency care to victims of mass casualty events, including mass shootings." This priority also places a goal on "improving coordination between law enforcement, fire service, EMS systems, other first responder agencies, and local healthcare delivery and trauma systems to improve victim triage, treatment and transport, and to ensure patients are distributed to appropriate levels of definitive emergency care." This priority then states that to achieve this capability, agencies should establish protocols on the medical principles of TECC and on conducting this training for first responders.

As the growth and popularity of TECC has increased, the Committee has received multiple requests for information regarding TECC training courses and/or official TECC certification. For those who are seeking to be trained or operationalize TECC into their agency high-threat standard operating procedures, it is important to understand that there are currently no "official TECC courses" or certification as a TECC provider or instructor. The TECC guidelines are open source and nonproprietary with the exception of the TECC logo. C-TECC believes that, though there are universal "principles" of high-threat response, the application must be tailored for individual agencies based on local resources, political climate, budget, and operational experience. "Cookie cutter" or standardized courses and applications for high-threat operations often fail to account for the differences among first responders that vary widely jurisdiction to jurisdiction, region to region, state to state, etc. As such, the concepts and skills in these classes have to be 'un-learned' or 'ignored' because they do not fit into the specific agency SOP or scope. Instead, we recommend that you use the in-house training staff and operational experts in your agency to create an operational paradigm and training program that is specific to your agency.

That being said, there are many companies and training programs that state they teach TECC courses. Many of these are very good with well-qualified instructors teaching the TECC guidelines as they are intended. However, over the past 2 years, with wider TECC implementation, training officers from across the nation began to express concern that vendors were incorrectly labeling their training as "abiding by TECC principles."

In an effort to assist end-users of TECC who are searching for quality out-of-house training as well as vetting for in house programs, the Committee has developed two programs to denote some standards to TECC educational programs: the *C-TECC Principles of Guidelines Instruction* and the *C-TECC Recognized Training Center.*

The cornerstone of the C-TECC's effort to distribute and educate first responders on the principles and applications of TECC is the commitment of the end-user and our educational partners to the abide by the *C-TECC Principles of Guidelines Instruction*. All educational partners recognized by the Committee pledge to abide by these principles as a condition of recognition and continued educational relationship with the Committee.

The C-TECC does not endorse any training organization or program but recognizes those educational partners who agree to use the guidelines, as written, without change to the language, scope, or intent contained within. Recognition by the Committee as adhering to the *Principles of Guidelines Instruction* in no way endorses quality of instruction but does demonstrate that the instructional content will be true to the language and intent of the guidelines as pledged by the training entity.

The C-TECC *Principles of Guidelines Instruction* speaks to both the student and to the educational/training entity that is teaching material related to the guidelines. It demonstrates that the educational entity, be it a person or a company, during instructional or other TECC

training courses, is committed to instructing the student in proper civilian application of the guidelines, as written without alteration, in the appropriate high-threat conditions. This policy applies mainly to the language and intent of the guidelines and does not preclude excluding parts of the guidelines that lay outside the scope of practice or beyond the boundaries of the accepted medical protocols of the student.

The C-TECC *Principles of Guidelines Instruction* is enforced by the Committee through the Board of Directors. The Board of Directors will do everything possible to fully investigate and resolve any complaints or notifications of instruction or alterations of the guidelines by educational/training entities that fall outside this policy.

Only organizations that follow the *Principles of Guidelines Instruction* set forth by the C-TECC are allowed to utilize the following language "in accordance with the *Principles of Guidelines Instruction* set by the Committee for Tactical Emergency Casualty Care" and the "C-TECC recognized training logo" on advertisements and instructional materials. In the near future, those companies that are recognized as in accordance with the standards set by C-TECC will be listed on the C-TECC website under training and educational resources.

This past summer, some of the members of C-TECC assisted in the development and implementation of a prototype TECC Recognized Training Center (RTC). The TECC RTC is a new initiative, and the backend logistical assets to support this project are being finalized. The RTC initiative places the responsibility to provide accurate TECC training where it belongs, in the hands of the first responders who are committed to serving and protecting their given community.

The TECC RTC development program entailed a 2-day Train-the-Trainer program targeting first responder agency training officers, agency leadership, and medical directors. The session is collaborative with agency leadership, providing tailored guidance based on locally identified threats and gap analysis. The Train-the-Trainer session also provides strategies for tiered TECC application based on the students that the RTC wishes to instruct and certify (i.e., fire personnel and RTF, patrol officers, SWAT personnel, EMS, hospital staff, emergency management, school staff, and community emergency response team [CERT]). It is suggested but not mandated that the RTC pool their instructors for the Train-the-Trainer from as many first responder disciplines as possible to create an environment of interoperability for their future course students. This technique has been shown to increase interoperability across multiple first response agencies. The RTC then serves as the training certification body. In general, the organizations that have requested the RTC training already provide training such as Prehospital Trauma Life Support, Advanced Cardiac Life Support, Basic Life Support, etc. This program offers local leaders the ability to expand their training offerings.

Anderson County, South Carolina, through federal grant funds, requested the Train-the-Trainer course and capability of expanding their training courses beyond their regional first responders to community entities. As with other agencies, C-TECC members have worked with to develop similar capabilities. Anderson County EMS & Special Operations Division is now trained and prepared to stand up an all-inclusive public safety model (e.g., law enforcement, EMS, fire, hospital, and CERT) and recognized TECC Training Center. Chief Stoller, Anderson County EMS, states, "Regionalization is important to us. A common set of goals and protocols allows us to work together better, safer and more efficiently." According to Stoller, their goal is to share this training with all public safety personnel in and around Anderson County as well as adapt the training to schools, industry, and other locations where this latest trauma training may help save a life.

Hot Topics

CAT Tourniquet Application: Single or Double Loop?

The C-TECC does not endorse any particular medical device or product. However, the Combat Application Tourniquet (CAT) is a widely tested and deployed device. Recently, a laboratory study by Clumpner et al. compared single-loop versus double--loop application of the CAT.[3] In regard to lower extremity application, the study found that by only routing through one loop, the median time of application was 3.5 seconds faster. The study also found that blood loss was statistically significantly lower: mean 93 ± 22.7mL versus 144 ± 79mL. Median difference was 87 versus 114mL. While this provides interesting information regarding the CAT application, there are several critical limitations to this study relating to operational medicine. First, this was a lab trial on manikins. Second, extraction/casualty movement was not simulated; models remained static. Third, though single-loop application was 3.5 seconds faster, the mean was thrown off by the "maximum" time outliers. Fourth, though blood loss difference was "statistically" significant (27mL of blood), it is unlikely to be clinically significant. Further, this difference in blood loss can be offset by proximal pressure to the vasculature while applying the CAT (for most operational personnel, this is standard operating procedure). When determining your application technique, you must account for a variety of operational considerations including the casualty's size, equipment that may impede

CAT application or result in loosening (e.g., other Velcro), and the universal requirement to move the casualty. Further, if you train single routing, there exists a higher risk that, under stress, the rescuer will apply only through the outer loop. This means a very thin piece of plastic is the only thing bearing all of the pressure of the constriction band. Again, slippage or fracture will result in catastrophic failure and loss of hemorrhage control. Single-loop application on the lower extremity may have some role in extremely time-constrained scenarios. However, this situation should be rare and the C-TECC continues to recommend utilization of both loops in the friction bar (i.e., double looping) on lower extremity application of the CAT. Proper training is critical, and the C-TECC believes it can mitigate the slightly increased time of application for double looping.

Conclusion

C-TECC will hold its winter meeting on 8 December 2014 at the Special Operations Medical Association Scientific Assembly. As always, the first day is open to the public. Please contact the Committee through the website at www.c-tecc.org with any concerns, questions, or suggested topics for the upcoming meeting.

References

1. Kotora JG Jr, Henao J, Littlejohn LF, Kircher S. Vented chest seals for prevention of tension pneumothorax in a communicating pneumothorax. *J Emerg Med*. 2013;45:686–694.
2. Kheirabadi BS, Terrazas IB, Koller A, et al. Vented versus unvented chest seals for treatment of pneumothorax and prevention of tension pneumothorax in a swine model. *J Trauma Acute Care Surg*. 2013;75:150–156.
3. Clumpner BR, Polston RW, Kragh JF Jr, et al. Single versus double routing of the band in the Combat Application Tourniquet. *J Spec Oper Med*. 2013;13:34–41.