

CoTCCC Meeting 2-3 February 2016 Atlanta, GA

Meeting Minutes

31 May 2016

Dr. Frank Butler

Dr. Stephen Giebner

Tuesday - 2 February 2016

1. Chairman's Welcome: Dr. Frank Butler convened the meeting and welcomed the meeting participants. After reviewing the agenda, it was noted that there are no conflicts of interests among the attendees.

2. Combat Medic Presentation: SPC Drake Monticelli presented an improvised explosive device (IED) scenario. Casualty #1 was the man who stepped on the IED. He suffered bilateral lower leg amputations. Four SOFT-T tourniquets were placed high and tight on his legs. The casualty was alert and oriented. The evacuation helo landed 42 minutes after wounding. The casualty was reported to have received 30 units of blood products at the medical treatment facility (MTF).

Problems encountered in treatment included:

- Three attempts at IV access and a humeral head intraosseous (IO) failed before a second humeral head EZ-IO was secured.
- Freeze dried plasma (FDP) couldn't be reconstituted quickly, and IO admin failed.
- TXA was lost when the only glass vial available broke during opening.
- Getting a litter to the patient took 25 minutes.
- Blood products were requested with evacuation, but evacuation was delayed for a litter request that wasn't made.
- During an attempt to administer RBCs during evac the IO needle was pulled out.

The casualty survived his injuries.

Casualty #2 was a PJ who was injured responding to casualty #1. He suffered shrapnel injuries to his face.

Lessons learned (“Sustains”) from this operation were:

- Wounds were rapidly identified and treated.
- Great team work/communication at point of injury and at treatment site.
- SOFT-T III TQ was rapidly and effectively placed.
- 10 mg of hydromorphone were given IM without relief of pain.
- Rapid pain control was achieved with 75 mg of ketamine given IO.
- The HLZ was changed in route to facilitate transport of the casualty.
- The casualty was well protected from rotor-wash as the aircraft was landing.
- There were no breaks in communication – which resulted in a rapid evacuation.

Lessons learned (“Improves”) from this operation included:

- The casualty wasn’t placed in an HPMK until movement to CASEVAC site.
- Pelvic stabilization was not performed.
- Only one fluid resuscitation site was established. “On board the flight medic tried to administer packed RBCs but only succeeded in pulling out the IO.”
- Antibiotics were not administered.
- TXA administration was attempted but the ampule broke. A rubber stopper vials would have been a better choice.
- FDP – it took approximately ten minutes to transfer the fluid and reconstitute. FDP infusion was slow because you cannot use infusion pressure techniques on the FDP glass bottle. The FDP stopped flowing into the IO site after half the dose was administered.
- The second casualty was not tracked to be on the helicopter right away. (The PJ who responded on the ground has shrapnel in his face, but was not initially recognized as a patient.)
- Better communication with evacuation personnel on 9 Line would have helped. “Blood products were requested, but they would not launch the birds until they knew how many litters we needed. No litters were ever requested. That miscommunication cost 12 minutes to an already 30 minute response time.”

3. TCCC Training in the 75th Ranger Regiment: MAJ Andy Fisher, 75th Ranger Regiment, briefed the Committee on developments in Ranger TCCC training. Ranger First Responder (RFR) training is based on TCCC and taught to both medics and non-medical personnel during Ranger Assessment and Selection Training. Currently, sustainment at platoon & company levels may not be robust or accurate. All Ranger Medics should become TCCC instructors. Moving forward, the RFR Program of Instruction has been approved through the National Association of EMT (NAEMT) educational infrastructure as a qualifying course for TCCC certification using the the

Joint Trauma System TCCC curriculum. Identified limitations at present include the required 4:1 student to instructor ratio, and the \$10 charge per TCCC card.

4. TCCC Update: CAPT (ret) Frank Butler, Chairman of the CoTCCC, reviewed items of recent interest in TCCC.

- TCCC concepts continue to be adopted by an increasing number of civilian EMS systems and law enforcement agencies. There are frequent reports of lives saved with officer-applied tourniquets or hemostatic dressings. TCCC-based civilian courses include the NAEMTs Bleeding Control and Law Enforcement First Responder courses, the Tactical Emergency Casualty Care course, the Specialized Tactics for Operational Rescue and Medicine (STORM) course at the Medical College of Georgia, the Advanced Law Enforcement Rapid Response Training at Texas State University, and others.

- The White House “Stop the Bleed” campaign is aimed at turning lay citizens who are present at trauma scenes into “Immediate Responders.” Immediate Responders should be trained to use TCCC concepts, including tourniquets and hemostatic dressings, to save lives by controlling external hemorrhage as quickly as possible.

- As presented during Hartford Consensus IV, civilian trauma leaders may be influenced by red/green charts similar to those used by the CoTCCC to track service Individual First Aid Kit (IFAK) components. Readiness to accomplish first responder external hemorrhage control (as measured by tourniquets and hemostatic dressing issue and personnel trained in TCCC-based courses) could be quantified by these red/green charts. Additionally, outcomes in wounded officers and mass casualty incidents should be captured through registries, case series, and case reports. Officer and mass casualty fatalities should be subjected to preventable death analyses.

- Dr. Butler noted that the Hartford Consensus papers recommend that organizations in the civilian sector who are purchasing tourniquets or hemostatic dressings review the recommendations and evidence base for these devices as compiled by the CoTCCC and DoD research laboratories. With respect to tourniquets and hemostatic dressings, Dr. Butler pointed out that in 2016, one can be either evidence-based or brand neutral, but not both.

- The CoTCCC has suspended further discussion of adding the Abdominal and Aortic Junctional (AAJT) to the TCCC Guidelines. There are research reports of adverse ischemic and reperfusion effects from two hours of abdominal aortic occlusion. The AAJT instructions for use state that it can be applied at the abdominal placement site for up to 4 hours. There is also no data at present that documents the safety of AAJT placement to control pelvic or junctional bleeding should the the casualty also have a vascular injury proximal to the aortic occlusion site.

- The CoTCCC has approved the addition of XStat compressed hemostatic sponges to the TCCC Guidelines. XStat has been shown to successfully control bleeding in a highly lethal bleeding model of combined subclavian artery and vein injury.

- Inconstancy in TCCC training across the DoD continues to be a significant problem. Many “TCCC” courses – aren’t. There has been no standardization of TCCC training across the DoD. TCCC courses are taught both by DoD organizations and

civilian training vendors. Incorrect messaging has been directly associated with adverse outcomes in casualties, while inappropriate training in some civilian courses puts both students and future patients at risk. Further, supervising physicians are often taught ATLS and not TCCC and do not have a knowledge of DoD-approved TCCC recommendations.

5. Bulletized TCCC Guidelines: Mr. Harold Montgomery presented work he and other medics have done to create a simplified version of the TCCC guidelines for medics' quick reference. They removed language pertaining to how to do things and why, and retained only that language conveying what to do. This was done in response to input from the medics, corpsmen, and PJs noting that the TCCC Guidelines are now 14 pages long and that combat medical providers need a reference document that conveys the needed information in a simpler, shorter format. Mr. Montgomery also presented a concept for an algorithmic version of the medic-level TCCC guidelines. This concept was well received by the audience and will be developed further.

6. IV/IO Medications in TCCC: SOCM James Holmes (Tactical Medic Program Manager for the Naval Special Warfare Command) presented the work done by him and a CoTCCC working group to develop a simplified approach to the administration of IV/IO medications in TCCC. The impetus for this effort is that there has in the past been little "how to" guidance in the TCCC curriculum on how to administer medications IV or IO in the tactical setting. Additionally, training medics in IV medication administration is problematic to accomplish in the hospital setting. IV medications are essential to optimal battlefield trauma care, but dosing errors may occur during the chaotic environment that is present in most combat casualty scenarios, making this is a focus area for TCCC. Improved training in this area is especially important for basic medics and corpsmen, who are not trained to the paramedic level. Proposed innovations in this area include:

- Simplifying guidance for administration (i.e. standardizing dose sizes, infusion times, medication concentrations, etc.)
- Minimize IV administration system variation
- Identifying a universal diluent This topic will be addressed as a revision to the TCCC curriculum in the next annual update.

7. Advanced Field Care: Dr. Butler discussed a concept that he designated as "Advanced Field Care." Prolonged Field Care (PFC) is for the medic who is stranded with a casualty in circumstances that prevent evacuation. Advanced Field Care (AFC) is conceptualized as more than TCCC, but less than damage control surgery, offering additional advanced interventions in prehospital settings and focusing largely on noncompressible hemorrhage. AFC is envisioned for use on ships, in subs, by Shock/Trauma units, in Battalion Aid Stations, MERTs, and in SOF Forward Operating Bases. Possible treatment options and diagnostic capabilities in AFC include:

- Fresh Whole Blood or 1:1 Resuscitation

- ResQFoam
- REBOA (Resuscitative Endovascular Balloon Occlusion of the Aorta)
- Chest tubes with possible re-infusion of shed blood
- FAST Scans
- Assisted ventilation (SAVe II) with oxygen
- Lateral canthotomy
- Infrared Scanning for intracranial hematomas

AFC could be used by providers at the paramedic level and above who are trained sufficiently to maintain procedural fluency in these procedures. Locations where AFC (which is basically a Role 1+ capability) is to be provided must be appropriately equipped. This approach would assist in the transition of a number of treatment modalities that are currently being developed under the Combat Casualty Care Research Program at the US Army Medical Research and Materiel Command.

8. TCCC Mobile: Dr. Steve Steffensen, the Chief of Innovation for the Military Health System, updated the Committee on the progress of a new Defense Health Agency Innovation initiative focused on developing a platform to streamline the flow of TCCC information and provide maximum access to available resources. In the current world of TCCC training and education, various communities get TCCC content from public and military sources, some of which may be at odds with actual TCCC recommendations. Additionally, medics and corpsmen have requested a TCCC knowledge product that provides a succinct overview of TCCC concepts in a format that can be supported by the personal smart phones that essentially all combat medical providers now own and carry with them while deployed. TCCC Mobile will be tailored to medic preferences and will offer standard content across multiple communications platforms. The platform will provide a range of blended learning – informal and formal training materials, combined with instructional videos, pushed alerts to highlight changes in practice, and other informational resources. In Dr. Steffensen’s recent survey of medics, the response to a proposed free TCCC app for mobile devices was 90% positive. Dr. Steffensen and Ms. Cynthia Barrigan have done outstanding work in securing MHS funding and executive sponsorship for the TCCC Mobile effort. It is anticipated that the initiative will be launched in June 2016. Mr. Harold Montgomery, Mr. Winn Kerr, MSG Curt Conklin and SFC Danny Morrissette will serve as the medic collaborators in design and development of this platform and its medical content. Another update will be provided at the 2016 Fall CoTCCC meeting.

Mr. Harold Montgomery and Mr. Win Kerr then previewed a concept of an interactive website featuring bulletized TCCC guidelines with embedded links to explanatory text, videos, etc. which could possibly serve as a launching platform for the TCCC Mobile app. If this course of action is adopted and funding is approved, a website could be launched in the very short term. Audience feedback regarding the design and function of the proposed website was very positive. Dr. Butler noted that the current TCCC websites that present the committees knowledge products in the “TCCC Classic” format will be maintained until there is user consensus to migrate to an updated format.

9. Proposed TCCC Guideline Change – iTClamp: MAJ Kyle Faudree from the 160th Special Aviation Regiment briefed the group on the proposal before the Committee to add the iTClamp to the guidelines. The iTClamp is often described as a “chip clip” type of device designed for wound closure. The device costs \$78, weighs 1.3oz, takes up 6 cubic inches of space, and has a 6-year shelf life. The clamp creates a fluid-tight seal and uses building hydrostatic pressure to tamponade the wound bed and promote clotting. MAJ Faudree pointed to 13 studies (5 of them clinical) showing safety and efficacy of the device. MAJ Faudree noted that the device is easy to learn, rapidly applied, and that the available literature indicates it is efficacious. Its proponents recommend using it as an adjunct to, not a replacement for, other hemorrhage control devices and hemostatic agents. MAJ Faudree also discussed the latest version of the recommended language for the guideline change. The Chairman will call this proposal to a vote in the near future.

10. Operational Medicine in the Submarine Force: CAPT Matt Hickey, Force Medical Officer for the Submarine Force Atlantic, discussed injury and illness on submarines. TCCC has not had a major emphasis in the submarine force because combat trauma typically does not occur on board. Worldwide, there are approximately 9 - 10 MEDEVACs from deployed subs each month. The approximate ratios have generally been 25% psychiatric, 25% injury (mostly blunt trauma), and 50% “all other” causes. Independent Duty Corpsmen follow protocols to manage the most common submarine medical conditions. Very rare mass casualty events have been due to collisions, fires or environmental malfunctions. CAPT Hickey noted that TCCC might have applicability in improving survival in the event of blunt trauma events or casualties that occur in submarine-based SEAL operations. Four ballistic missile submarines have been converted to support Naval Special Warfare missions. These missions can be supported as needed by embarked smaller, mobile surgical units such as the Navy's Expeditionary Resuscitative Surgical System, which have the capability to provide damage control surgery at a role II level of care.

11. Air Force Pararescue Capabilities Briefing: MSgt Travis Shaw presented an overview of the organization and capabilities of the USAF Pararescue (PJ) community. PJs are not just combat medics; they are combat search and rescue specialists whose mission also includes providing medical care and performing recovery operations. Their medical training includes TCCC and Paramedic certification, but contains many other elements of prehospital care as well. MSgt Shaw described the structure and missions of the USAF Rescue (Guardian Angel) units aligned under Air Combat Command and the Special Tactics Squadrons aligned under the Air Force Special Operations Command. He also presented examples of a variety of PJ capabilities, to include tactical proficiency, collapsed structure rescue, confined space rescues, technical rescues, swiftwater rescue, open ocean rescue, and mountain/avalanche rescue. MSgt Shaw presented a selection of recent missions that illustrate the wide range of tactical emergencies to which PJs can effectively respond.

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12. Medical Devices for Control of Noncompressible (Truncal) Hemorrhage: Dr. Bijan Kheirabadi from the U.S. Army Institute of Surgical Research discussed exovascular and endovascular hemostatic devices. Exovascular devices include external compression devices (MAST trousers, the pelvic hemostasis belt, the AAJT) and intra-abdominal techniques (gases such as carbon dioxide and nitrogen and hemostatic foams). REBOA was the only endovascular approach discussed. Dr. Kheirabadi presented an overview of these devices regarding their mechanisms of action, efficacy, problems caused by their use, and current approval status under the FDA.

In summary:

- Significant progress has been made in developing new technologies for trauma resuscitation and control of non-compressible (abdominal and pelvic) hemorrhage in the Emergency Department or Operating Room..
- Translation of these technologies to the prehospital setting not only requires extensive operator training and may not be possible to implement safely.
- In a 2-hour application, the lower body ischemia produced by the AAJT caused significant metabolic derangements similar to crush syndrome that were life-threatening at the time of pressure release and tissue reperfusion (hyperkalemia and acidosis). Hyperkalemia treatment and cardiopulmonary support are necessary at the time of release of AAJT to overcome possible respiratory or cardiac arrest. The long-term effects of AAJT use and its potential damage on the abdominal organs (e.g., intestines, bladder and kidneys) are unknown and are the subject of the current ISR study.
- Experimental studies in swine showed that CO₂ insufflation reduced blood loss in non-lethal parenchymal bleeding (liver or splenic injuries) in 30-minute experiments. The optimum insufflation pressure was 20 mmHg, which was produced with a portable insufflator.
- A more feasible approach is likely to be prehospital administration of blood/blood products along with hemostatic drugs or new synthetic polymers to restore plasma volume and stabilize blood clots so that they remain intact during fluid resuscitation and help to minimize rebleeding.

Following the presentation, Dr. Butler presented Dr. Kheirabadi with a CoTCCC Special Award for his outstanding contributions to improving battlefield trauma care through his many research accomplishments in hemostatic dressings, chest seals, noncompressible hemorrhage, and junctional tourniquets..

13. iGel as the Proposed CoTCCC Supraglottic Airway of Choice: Dr. Mel Otten presented the iGel supraglottic airway (SGA) to the group. In 2012, the CoTCCC removed recommendations for specific SGA devices from the TCCC guidelines since there are now a number of commercially available SGAs and there was no clinical evidence that any specific SGAs were superior to others. To date, the King LT is the

SGA most commonly trained in the military. However, it can be positioned too proximally so that air doesn't flow into trachea, and this has been noted to occur in combat casualties.

The iGel is another SGA option for the combat medical provider. Advantages of the iGel include:

- Smaller, lighter, and shorter than other SGAs
- Does not have an inflatable portion
- Does not require a syringe
- Cost is half approximately that of the King LT or LMA
- Easier and faster to insert than other SGAs
- Minimal reported complications
- Easy to train
- Has a gastric port, an oxygen port and easy access for fiber optic intubation

Multiple published studies have shown that the iGel performs well in comparison to other SGAs. One report found that the I-gel was placed correctly 96% of the time with minimal training.

An area of concern with the iGel is the lack of information on how well it performs at low ambient temperatures. Dr. Otten has had a very favorable personal experience with this device and concluded with a recommendation that the iGel should be the named the preferred SGA in the TCCC Guidelines.

14. Battlefield Medical Strategy: COL Shawn Nessen, Trauma Consultant to the Army Surgeon General, reviewed the advancements in combat casualty care in WWI, WWII, Korea, and Vietnam. He described advances in trauma care made during the conflicts in Iraq and Afghanistan, including the development of the Joint Trauma System, American College of Surgeons certification of Landstuhl as a trauma center, improvements in the utilization of blood products, to include their location further forward on the battlefield, employment of Forward Surgical Teams, reducing prehospital death from potentially survivable injuries through the application of TCCC principles, and the development of new prosthetics and orthotics. COL Nessen presented several representative case reports of casualties with very severe injuries and described their management.

In the future, military medical units must be able to maneuver and move with their supported units on the battlefield. Strategic concepts must focus on medical support early in theater opening, recognizing that the Combat Support Hospital is the center of gravity for medical care. In addition, Army medicine must be responsive to an ever-changing host of non-battle contingency operations in new theaters of combat.

15. Saving Lives on the Battlefield - Return to Iraq: COL James Geracci, III Corps Command Surgeon, briefed the attendees on the nature of our current presence in Iraq. Much of our former medical capability there is gone, and Iraq is now a very austere theater. The recent return of U.S. military units to theater is very limited - economy of force principles require strict force manning limitations and necessitate non-doctrinal

solutions. As there is no true medical hub and limited MEDEVAC capability in Iraq at present, damage control surgery must be provided very close to kinetic activity.

COL Geracci noted that some aspects of trauma care are working well at present:

- TCCC is the standard of care by both US Central Command and Task Force mandate
- Operational leadership understands casualty care management and the need to have both medical and non-medical combatants able to perform lifesaving interventions on the battlefield
- The “Vampire” blood program – blood components provided during TACEVAC
- Critical Care Flight Paramedic training
- There is TCCC penetrance into coalition forces

COL Geracci also noted a number of opportunities to improve:

- Predeployment TCCC/trauma training is inconsistent at best
- Prehospital and Role 2 documentation is not being reliably accomplished
- TCCC equipping is still incomplete, especially with respect to junctional tourniquets and analgesics
- Walking Blood Banks are not being optimally utilized
- The theater trauma system is not robust. There is no “trauma czar” and there is a lack of DCS/DCR expertise far forward

COL Geracci concluded by reinforcing the importance of ‘muscle memory’ for TCCC and that TCCC should be mandated for every Soldier, medic, and leader. He further stated that all operational physicians and PAs in III Corps and all resident physicians on Fort Hood are now required to be NAEMT-TCCC trained.

16. Squad Overmatch TCCC Training: COL Dan Irizarry (Clinical Advisor, Joint Program Management Office For Medical Modeling and Simulation) described this blended training system designed to optimize both squad performance in TCCC and small unit casualty response. The Squad Overmatch TCCC (SOvM-TC3) training project uses squad overmatch techniques and blended instruction technologies (moulage, manikins, virtual reality) to create integrated training in TCCC. He also discussed the concept of an exportable TC3 training system (TC3X) designed to allow a medic to train 30 soldiers making use of all of these training modalities.

COL Irizarry’s take-aways:

- Effecting lasting changes in the military requires sustained programs of record. Programs of record institutionalize capabilities and help to secure long-term funding.
- Institutionalizing optimal care of combat casualties on the battlefield requires program of instruction changes not in just what we teach, but also in how we teach. This applies not only to medical training programs, but throughout the enterprise.
- To change line officer thinking, you must use line officer processes.
- Lasting culture change occur through education, but can be sparked by technology.

17. PHTLS TCCC-BASED COURSES: Mr. Mark Leuder is the National Association of Emergency Medical Technicians (NAEMT) lead on their TCCC-based courses. TCCC-based courses offered by NAEMT include:

- B-Con (Bleeding Control) is a 2.5 to 3-hour course focused on tourniquets, hemostatic dressings, and airway control. It is intended for police and schools and is the foundational training course for the American College of Surgeons Hartford Consensus effort as well as the White House “Stop the Bleed” campaign.

- LEFR (Law Enforcement First Responder) is an 8-hour course designed for police officers that emphasizes external hemorrhage control (tourniquets and hemostatic dressings) as well as tactically appropriate responses to injuries sustained in a law enforcement environment.

- The NAEMT TCCC course uses the curriculum developed by the Joint Trauma System is 16 hours long. This course is taught to US military units at their request; to civilian and government agencies; and to foreign militaries.

- TECC (Tactical Emergency Casualty Care) is a 16-hour course that is based on TCCC concepts, but incorporates wording and scenarios more appropriate to civilian settings. Note that these courses adhere to the TECC guidelines published by the Committee for Tactical Emergency Casualty Care and may have some variance from the principles taught in military TCCC courses.

18. PTSD in the Pararescue Career Field: Lt Col Steve Rush, Medical Director for the Air Force PJs, presented key findings from a recent study conducted by a team Air Force psychologists:

- PJs report levels of exposure to combat and the aftermath of battle experiences that are comparable to other military personnel in **both** the combat arms and medical professions, but the PJ aftermath and medical exposures often occur in high-threat environments like burning vehicles/airframes, enemy fire, confined space, structural collapse, swift water, etc.

- Prevalence of psychological symptoms among PJs (11% PTSD, 1.5% depression, and 16% insomnia) is comparable to or lower than overall military estimates. A caveat about these numbers is that the study was not anonymous and the incidence of these disorders may be under-reported because of reluctance to disclose. Of note, approximately 30% of PJs who have deployed have chronic symptoms of combat stress, but do not meet the criteria for PTSD.

- Risk factors identified for PTSD in order of importance are 1) intense exposure to medical injuries, death, and other "aftermath of battle" exposures; 2) the daily frustrations, inconveniences, and administrative of military life; and 3) participation in combat actions.

- Combat exposure correlated significantly with increased occurrence of depression, whereas medically related exposures correlated with more severe PTSD symptoms. Removal and handling of dead bodies is the strongest predictor of PTSD severity.

- Unit cohesion and a sense of purpose and meaning were protective factors against both PTSD and depression.

- The incidence of mental health issues in reserve components is reported as 19%, twice that of the active component at 8.5%.

Another psychological occurrence in PJs and other combat troops is "Burnout." Lt Col Rush described burnout as emotional exhaustion; feeling worn out because of your work; a sense of lack of personal achievement; the feeling that work is meaningless; and the tendency towards cynicism and depersonalizing those around you. Burnout is correlated more with the number of deployments that PJs experience, rather than trauma experience or combat exposure.

Lt Col Rush outlined some of the measures that may help to prevent and/or decrease the adverse impact of PTSD and depression in the PJ community:

- Advocate for embedded Operational Psychologists when feasible
- Identify/select Psychologists in and out of the Air Force who are most effective in the treatment of PTSD and depression in PJs
- De-stigmatize the emotional and psychological distress that is the norm for service members with combat experience
- Address issue of lost pay for men who can still operate but need treatment.
- Establish unit-based internal crisis response teams, peer counseling and support
- Develop other options for support for psychological health
- Continue with research efforts in this area
- Improve the mental health capabilities of PJ Flight Surgeons
- Provide basic training for Pararescue community leaders on how to identify and handle operators in need of care and support.

19. TCCC Training Initiatives at DMRTI: COL Kirby Gross and MAJ Walter Engle emphasized that the Defense Medical Readiness Training Institute's (DMRTI's) #1 priority is reinforcing TCCC as the standard for point-of-injury care throughout the US Military. They noted that there is currently no standardization of TCCC courses in the DoD, which has resulted in wide variation in their content. This variation has been associated with adverse outcomes in casualties and has also resulted in students participating in TCCC courses being subjected to inappropriate and potentially hazardous medications and procedures as part of their training. They also noted that not all military physicians and PAs obtain TCCC training at present. A Joint Trauma System White Paper sent to the service Surgeons General in September of 2015 highlighted the current problems with TCCC training and recommended corrective actions to address these deficiencies.

COL Gross and MAJ Engle also discussed current DMRTI efforts to increase the quality and accuracy of TCCC training courses across the DoD. A strategic partnership between the NAEMT and the Military Training Network (MTN) would facilitate military organizations functioning as NAEMT-approved training sites. NAEMT became involved in TCCC training in 2009, when, at the request of the CoTCCC Chairman, they helped to provide TCCC training for the Spanish Special Forces. The NAEMT has a robust educational infrastructure accredited by the Continuing Education Coordinating Board of Emergency Medical Services. NAEMT TCCC courses use the curriculum developed by

the CoTCCC and provide a TCCC certification card to course graduates that is endorsed by the JTS, the CoTCCC, the NAEMT, and the ACS Committee on Trauma. Issues that still need to be addressed include identifying a funding source for the \$10 per student cost for NAEMT TCCC courses and agreement on the qualifications that military medics must have to be designated as TCCC instructors.

DMRTI is exploring a number of initiatives that will may help facilitate TCCC training throughout the DoD:

- Using Joint Knowledge Online (JKO) for registration of TCCC students
- DMRTI Training Teams to provide the TCCC for Medical Personnel course to requesting units
- JKO tracking of TCCC-MP and TCCC-AC training for all Services
- DMRTI coordination with DoD Simulation Centers to create a Joint Simulation and Medical Modeling (JSIMM) course to compliment the approved Squad Overmatch Program being instituted by COL Irizarry at the Joint Program Management Office For Medical Modeling and Simulation.

COL Gross and MAJ Engle also proposed that DMRTI provide a TCCC Handbook to TCCC course students. The Center for Army Lessons Learned has a TCCC Handbook that could be updated for this purpose. (Chairman's Note: This is an excellent suggestion and has been taken for action by the CoTCCC. The TCCC Handbook will be medic-driven and will present TCCC information in a more succinct format than present TCCC knowledge products.)

20. Three Things That I Would Change about TCCC: Surgeon Captain Steve Bree, Royal Navy, is the British Liaison Officer to the Surgeon General of the Army. At the invitation of the CoTCCC Chairman, he offered his thoughts about the top three opportunities to improve in TCCC as he sees them. He prefaced his remarks by noting that his opinion of TCCC is very positive. He remarked that the TCCC effort has a "Team Sky" mentality that maintains "a relentless and open-minded search for every conceivable improvement."

CAPT Bree then presented the organization and manning of prehospital emergency medicine (PHEM) in the UK in the larger context of the U.K. National Health System. With respect to combat casualty care in the US Military, he asked: "Where are your pre-hospital emergency medicine physicians?" and noted that the accomplishments of the UK Medical Emergency Response Team (MERT) "shone brightly" in the recent conflict in Afghanistan but commented it was a only single asset against the large number of US medical evacuation platforms. CAPT Bree stated that TCCC skills should be progressive and extend past the paramedic skillset, and that the level of care should increase all along the evacuation chain. Although he acknowledged the US medical mission of caring for dependents and beneficiaries, he observed that this must be balanced against the need for a highly developed level of expertise in trauma care that focuses on our deployed mission. CAPT Bree considers the autonomy and authority of our senior enlisted medics and the dynamism of TCCC to be lessons that should be taken on board by the U.K. military.

CAPT Bree's top three recommendations for improving TCCC are: 1) to add pelvic binders to the TCCC Guidelines for casualties with suspected pelvic fractures; 2) to

establish the placement of physicians and medics together in the prehospital combat environment as doctrinal and routine; and 3) to bring about greater placement of military medical personnel in civilian trauma centers and on civilian prehospital platforms.

Additionally, he observed that TCCC analgesia protocols are too conservative; that supraglottic airway devices must also be included in Tactical Field Care in addition to nasopharyngeal airways and cricothyroidotomy; that pediatric trauma care should be addressed; and that TCCC training should be more realistic and include “real-life injured” role players.

21. The Role of Pelvic Binders in TCCC: COL Stacy Shackelford briefed the group on the topic of adding pelvic binders to the TCCC Guidelines. She noted that pelvic fracture is a common and serious injury among the combat injured. Twenty-six per cent of service members who died in OEF/OIF had a pelvic fracture, and casualties with bleeding pelvic fractures and hemodynamic instability have up to a 40% mortality rate. Pelvic binding is the only prehospital intervention with which to address pelvic fractures; it may be helpful with venous bleeding, but is probably ineffective against arterial hemorrhage. Commercially available circumferential pelvic compression devices include the Pelvic Binder, the T-POD, and the SAM Sling.

Col Shackelford then reviewed the following clinical questions with regard to pelvic binders and discussed the evidence on each:

- Does a pelvic binder stabilize pelvic fractures? Cadaver studies indicate it does.
- Does a pelvic binder decrease the bleeding from a pelvic fracture? There is evidence that it does.
- Does the use of a pelvic binder improve survival? The clinical evidence that it does is weak. Col Shackelford also noted that bleeding from some pelvic fracture patterns may not be reduced by pelvic compression.
- Who should get a pelvic binder? 1) Dismounted IED casualties with lower extremity amputations; 2) Casualties with blunt trauma and SBP <100, or HR > 100, or GCS of 13 or less; or pelvic pain in the presence of a distracting injury
- Is there harm in applying a pelvic binder? A pelvic binder is unlikely to increase injury or bleeding when applied acutely, but longer use of a pelvic binder may cause pressure ulcers and there is some chance that a pelvic binder may make breathing more difficult.
- Which pelvic binder is best? There is weak evidence that the available commercial devices are better than the use of a sheet to reduce pelvic fractures. None of the commercial devices has so far been shown to be superior to the others.

COL Shackelford recommends adding language to the TCCC guidelines that calls for a pelvic binder to be applied for cases of suspected pelvic fracture (to include securing the legs or binding the thighs together) as exemplified by:

- Casualties with blast injury with amputation
- Casualties with blunt trauma and
 - SBP <100, HR > 100
 - GCS 13 or less
 - Pelvic pain or distracting injury

22. CoTCCC Action Items: Dr. Frank Butler reviewed ongoing and proposed CoTCCC action items.

Current CoTCCC action items:

- TCCC trademark issues- the Joint Trauma System is pursuing cancellation of a TCCC trademark inappropriately issued to an individual uninvolved with the US Military TCCC effort. The US Military conceived and published the term “Tactical Combat Casualty Care” and “TCCC” over a decade before the trademark application.
- DOD-FDA Military Use Panel for Combat Casualty Care medications – the current FDA regulatory structure for medications is not well configured to support combat casualty care in the US Military. This issue has been noted in several published papers and pursuit of a solution to this situation is ongoing.
- Medical Rapid Fielding Initiative – there still not an organized DoD-level effort in place to accomplish the rapid fielding of newly-recommended combat casualty care equipment and medications to deployed and deploying US military units. This expedited fielding should be accompanied by the collection of focused feedback on the performance of the newly-fielded items. This need for such a program has been noted in several published papers and pursuit of a solution to this situation is ongoing.
- PHTLS 9th Edition, Military Version – Work on the next edition of the PHTLS textbook is underway. Any members of the group wishing to volunteer their help with this effort should get in touch with Dr. Giebner.
- Improving the standardization of TCCC training in the DoD

Proposed TCCC Guidelines changes coming to a vote:

- iTClamp
- Pelvic binders in TCCC
- iGel as the TCCC SGA of choice

Potential TCCC Guidelines Changes:

- Higher initial dosing of ketamine.
- Include casualty positioning recommendations for performing needle chest decompression
- Foley catheter balloon treatment of head and neck bleeding
- Other options for treatment of suspected tension pneumothorax
- Manual compression of the abdominal aorta for junctional hemorrhage if no junctional tourniquet is available and Combat Gauze is not working
- A review the use of c-collars and spinal immobilization in TCCC
- Traction splinting recommendations

Future technology items: (After FDA Approval and/or More Studies)

- ResQFoam
- Compensatory Reserve Index Monitor OR point of injury lactate monitoring OR tissue O2 saturation monitoring

- AAJT

TCCC Curriculum Updates for 2016:

- IV medication skill sheet and practical
- Emphasize the need for IMMEDIATE administration of TXA for casualties with non-compressible hemorrhage

Acknowledgments

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Disclaimers

The opinions or assertions contained herein reflect the events of the February 2016 CoTCCC meeting. They are not to be construed as reflecting the views of the Department of the Army or the Department of Defense.



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Developmental Editor
Committee on TCCC

31 May 2016

Date



Frank K. Butler, M.D.
CAPT, MC, USN (Ret)
Chairman
Committee on TCCC

31 May 2016

Date

Enclosure (1) – Meeting Attendance

CoTCCC Voting Members:

Dr. Jim Bagian
COL Peter Benson
Dr. Frank Butler
MSG Curt Conklin
COL Jim Czarnik
COL Erin Edgar
MAJ Kyle Faudree
Dr. Doug Freer
COL Jim Geracci
COL Kirby Gross
CAPT Matt Hickey
SOCM James Holmes
Dr. Jay Johannigman
Mr. Win Kerr
SFC Danny Morissette
COL Shawn Nessen
COL Kevin O'Connor
LCDR Dana Onifer
Dr. Mel Otten
Mr. Don Parsons
Mr. Gary Pesquera
Col Todd Rasmussen
HSCM Glenn Royes
Lt Col Steve Rush
COL Samuel Sauer
Col Stacy Shackelford
MSgt Travis Shaw
CAPT Jeff Timby
HMCS Jeremy Torrisi
CMDCM Steve Viola

TCCC Subject Matter Experts

Dr. Brad Bennett
Dr. Jeff Cain
Dr. Howard Champion
Dr. Warren Dorlac
Dr. Jim Dunne
Dr. Rocky Farr
Dr. Russ Kotwal

CoTCCC Staff

Dr. Steve Giebner
Ms. Danielle Davis
Mr. Harold Montgomery

Guest Presenters

COL Steve Bree
MAJ Andy Fisher
COL Dan Irizzary
Dr. Bijan Kheirabadi
SPC Drake Monticelli
Dr. Steve Steffensen

Military Liaisons

Lt Col David Carey
COL Lance Cordoni
Maj Kevin Cron
MSG Mike Eldred
Ms. Elizabeth Fudge
LTC Kyle Remick
Ms. Mary Ann Spott
COL Ian Wedmore
Mr. Ed Whitt
COL Mike Wirt
CDR Rick Zeber

Allied Liaisons

COL Elon Glassberg
LTC Kazumichi Yoshida

Interagency Liaisons

Mr. Josh Knapp

Additional Guests

Ms. Cynthia Barrigan
Mr. Thomas Bigott
Ms. Julie Chase
Dr. Gary Gilbert
Dr. Rick Hammesfahr
COL Ian Lane
Mr. Jeff Luciano
Maj Bill Lutin
COL (ret) Robb Mazzoli
MAJ Heath Sheehan
MAJ Marion Smith