TCCC UPDATES

Committee on Tactical Combat Casualty Care

Atlanta
7-8 September 2016

Why We Are Here

Disclaimer
“The opinions or assertions contained herein are the private views of the authors and are not to be construed as official or as reflecting the views of the Departments of the Army, Air Force, Navy or the Department of Defense.”

ZERO Preventable Deaths!

Thanks:
SFC (R)
Dom Greydenus
Tourniquets: The Primary Driver for TCCC

“The striking feature was to see healthy young Americans with a single injury of the distal extremity arrive at the magnificently equipped field hospital, usually within hours, but dead on arrival. In fact there were 193 deaths due to wounds of the upper and lower extremities, ...... of the 2600.”

CAPT J.S. Maughon
Mil Med 1970

* Extremity hemorrhage math in Vietnam: 193 of 2600 = 7.4% x 46,233 fatalities = 3,421 preventable US deaths from extremity hemorrhage

TCCC Special Award

- Dr. John Kragh
USAISR

- Without COL (R) Kragh, we would still be arguing about whether or not to use tourniquets, rather than how best to use them.

Tactical Combat Casualty Care

The Prehospital Arm of the Joint Trauma System

TCCC

- Medics, Corpsmen, PJs
- Combat Lifesavers
- All Combatant Self/Buddy Care
- Includes Tactical Evacuation Care

Where can we save the most lives?

Better Prehospital Care = Decreased KIAs

2016 IOM Report
Battlefield Trauma Care:
2001
• Based on trauma courses NOT developed for combat
• Medics taught NOT to use tourniquets
• No hemostatic agents
• No junctional tourniquets
• Large volume crystalloid fluid resuscitation for shock
• Civil War-vintage technology for battlefield analgesia (IM morphine)
• SOF medics – IV cutdowns for difficult venous access
• No tactical context for care rendered
• 2 large bore IVs on all casualties with significant trauma
• No focus on prevention of trauma-related coagulopathy
• Heavy emphasis on endotracheal intubation

Battlefield Trauma Care:
Now
• Phased care in TCCC
• Aggressive use of tourniquets in CUF
• Combat Gauze as hemostatic agent
• Aggressive needle thoracostomy
• Sit up and lean forward airway positioning
• Surgical airways as needed for facial trauma
• Hypotensive resuscitation (with blood products if feasible)
• IVs only when needed; IO access if required
• PO meds, OTFC, ketamine as “Triple Option” for battlefield analgesia
• Hypothermia prevention; avoid NSAIDs
• Battlefield antibiotics
• Tranexamic acid
• Junctional Tourniquets/XStat

TCCC Team 2016
CoTCCC/JTS PLUS
• Selected TCCC Subject Matter Experts
• Special Operations Medicine
• Prehospital Trauma Life Support/NAEMT
• Trauma and Injury Subcommittees – Defense Health Board
• Military Liaisons
  – Service Medical Departments
  – Combatant Commander Surgeons/Reps
  – Office of the ASD for Health Affairs
  – Operational units
  – Combat Doctrine Development and Systems Commands
  – Armed Forces Medical Examiner System
  – Defense Health Agency MEDLOG
  – USAISR + other military medical research labs
  – Combat medical schools
• Allied Nation Liaisons
• Interagency Liaisons

TCCC Lessons Learned
5. Maintain an Active Search for Good Ideas – Wherever They Can Be Found – and Process Them As Though Lives Depended on It

Intraosseous Devices:
Direct Medic Input
• SFC Rob Miller – CoTCCC Meeting 2002
• Places an IO device on the table
• “Why aren’t we using these things?”
• CoTCCC agreed – despite minimal use in prehospital trauma care at the time
• Now used universally in the US Military
"First get your facts; then you can distort them at your leisure."

Mark Twain

**TCCC Literature Review**

**"Three Things I Would Change in TCCC" Talks**

- Surg CAPT Steve Bree – February 2016
- Top recommendation – add pelvic binders
- TCCC Working Group agreed
- Proposed change on pelvic binders pending
  – Col Stacy Shackelford

**TCCC Journal Watch**

**TCCC Distro List**
- TCCC Change Notices
- TCCC Article Abstracts
- TCCC Info Items

* To be added to the list: danielle.m.davis.civ@mail.mil

**TCCC Curriculum:**

- MHS and NAEMT Websites
  - Also Soma and JSOM
  - Also direct mailings to DoD combat medical schoolhouses
  - Dr. Steve Giebner

**TCCC Guidelines:**

- The What
- TCCC Curriculum: The How
- MPHTLS Text: The Why
- TCCC Change Papers: The Detailed Why

"Military units that have trained all of their members in Tactical Combat Casualty Care have documented the lowest incidence of preventable deaths among their casualties in the history of modern warfare."
TCCC: How Do We Know That It’s Working?

- Near universal DoD acceptance after 14 years of war
- 67% reduction in deaths from extremity hemorrhage
- Tarpey 2005: “Overwhelming Success” in 3rd ID
- Kragh: Estimated over 1000 lives saved with tourniquet use – in 2008
- Kotwal: Lowest incidence of preventable deaths ever documented by a combat unit
- Savage: Highest casualty survival rate in Canadian Military’s history
- Acceptance by NAEMT/American College of Surgeons /Hartford Consensus/WH Stop the Bleed

TCCC: The Tactical Imperative

How many lives and missions have been saved by tactically appropriate battlefield trauma care?

Care Under Fire

- If the firefight is ongoing - don’t try to treat your casualty in the Kill Zone!
- Suppression of enemy fire and moving casualties to cover are the major concerns.
- The best medicine on the battlefield is Fire Superiority!

Then-Commander Bill McRaven

Raid on Entebbe

ADM Bill McRaven

- 27 June 1976
- Air France Flight 139 hijacked
- Flown to Entebbe (Uganda)
- 106 hostages held in Old Terminal at airport
- 7 terrorists guarding hostages
- 100 Ugandan troops perimeter security
- Israeli commando rescue planned

Raid on Entebbe

ADM Bill McRaven

The Rescue: 4 July 1976

- Exit from C-130 in a Mercedes and 2 Land Rovers to mimic mode of travel of Idi Amin – the Ugandan dictator at the time
- Israeli commandos dressed as Ugandan soldiers
- Drove up to the terminal - shot the Ugandan sentry
- Assaulted the terminal through 3 doors
Raid on Entebbe

**ADM Bill McRaven**

- LTC Yoni Netanyahu – the ground commander – shot in the chest at the beginning of the assault
- What should the medic do?
  - Disengage from the assault?
  - Start an IV?
  - Immediate needle decompression of chest?

---

**Raid on Entebbe**

**ADM Bill McRaven**

“As previously ordered, the three assault elements disregarded Netanyahu and stormed the building.”

“At this point in the operation, there wasn’t time to attend to the wounded.”

---

**Ma’a lot Rescue Attempt**

**ADM Bill McRaven**

- 15 May 1974
- 3 PLO terrorists take 105 hostages
- Schoolchildren and teachers
- When assault commenced, terrorists began killing hostages
- 22 children killed, 56 wounded
- The difference between a dramatic success and a disaster may be measured in seconds.

---

**Recent Feedback from a TCCC Student**

“I have never even heard of the Raid on Entebbe. Why do we need to learn about military history?”
There are only two times that you can plan for what to do in a tactical casualty situation....

SEAL Hostage Rescue – Afghanistan 2012

- Second assaulter killed one hostile
- Secured the hostage (an American physician)
- Held a second hostile by the throat until he could be neutralized by another team member
- Room cleared - hostage passed off
- THEN the second assaulter, a corpsman, began to treat the casualty

SCPO Ed Byers – The Second Assaulter

The Tactical Imperative: Senior SOF Leader Quote

“I watched with tremendous pain as the (nation redacted) failed in a mission because they stopped mid-assault to care for one of their wounded. It ended up costing them three more lives and a failed rescue attempt. We should never forget that you have to secure the target quickly so you don’t lose more lives and you can then save the ones that are injured.”
## Agenda
### 7 Sept 2017 - AM

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800</td>
<td>Butler</td>
<td>Admin Remarks and Introductions</td>
</tr>
<tr>
<td>0830</td>
<td>McKenzie</td>
<td>Combat Medic Presentation</td>
</tr>
<tr>
<td>0900</td>
<td>Parfitt</td>
<td>Senior Leader Remarks</td>
</tr>
<tr>
<td>0930</td>
<td>King</td>
<td>Anti-Dote Update</td>
</tr>
<tr>
<td>0945</td>
<td>Talley</td>
<td>Senior Leader Remarks</td>
</tr>
<tr>
<td>1015</td>
<td>Stockinger</td>
<td>JTS Director Brief</td>
</tr>
<tr>
<td>1045</td>
<td>Murray</td>
<td>Antibiotics in TCCC</td>
</tr>
<tr>
<td>1115</td>
<td>Butler</td>
<td>TCCC Update</td>
</tr>
<tr>
<td>1145</td>
<td>Cordeni</td>
<td>Army TCCC Initiatives</td>
</tr>
<tr>
<td>1200</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

### 7 Sept 2017 - PM

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
<td>Kragh</td>
<td>Tourniquet Update</td>
</tr>
<tr>
<td>1330</td>
<td>Montgomery</td>
<td>TCCC Comprehensive Review Change</td>
</tr>
<tr>
<td>1400</td>
<td>Group</td>
<td>Discussion</td>
</tr>
<tr>
<td>1430</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>1445</td>
<td>Riesberg</td>
<td>Prolonged Field Care</td>
</tr>
<tr>
<td>1515</td>
<td>Baer</td>
<td>CCC/CP Feedback - TCCC R&amp;D &amp; E Priorities</td>
</tr>
<tr>
<td>1545</td>
<td>Curnol</td>
<td>BORSTAR Overview</td>
</tr>
<tr>
<td>1615</td>
<td>Missal</td>
<td>70th Ranger Regt Whole Blood Program</td>
</tr>
<tr>
<td>1645</td>
<td>Finish</td>
<td></td>
</tr>
<tr>
<td>1800</td>
<td>Dinner</td>
<td></td>
</tr>
</tbody>
</table>

## Agenda
### 8 September 2016 - AM

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>0800</td>
<td>Butler</td>
<td>Administrative Remarks</td>
</tr>
<tr>
<td>0815</td>
<td>Decker</td>
<td>Combat Medic Presentation</td>
</tr>
<tr>
<td>0845</td>
<td>Cords</td>
<td>Senior Leader Remarks</td>
</tr>
<tr>
<td>0915</td>
<td>Gebrner</td>
<td>TCCC Curriculum 2016</td>
</tr>
<tr>
<td>0945</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>1000</td>
<td>Fang</td>
<td>Three Things I Would Change about TCCC</td>
</tr>
<tr>
<td>1030</td>
<td>Knapp</td>
<td>TCCC in the ATF</td>
</tr>
<tr>
<td>1100</td>
<td>Holcomb</td>
<td>NAS Trauma Care Report</td>
</tr>
<tr>
<td>1130</td>
<td>Eastman</td>
<td>TCCC in TEMS</td>
</tr>
<tr>
<td>1200</td>
<td>Lunch</td>
<td></td>
</tr>
</tbody>
</table>

## Agenda
### 8 September 2016 - PM

<table>
<thead>
<tr>
<th>Time</th>
<th>Name</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>1300</td>
<td>Zeber</td>
<td>DHA MEDLOG</td>
</tr>
<tr>
<td>1330</td>
<td>Barrigan</td>
<td>TCCC Mobile App/Website</td>
</tr>
<tr>
<td>1400</td>
<td>Montgomery</td>
<td>TCCC Mobile App Discussion</td>
</tr>
<tr>
<td>1430</td>
<td>Break</td>
<td></td>
</tr>
<tr>
<td>1445</td>
<td>Butler</td>
<td>Pelvic Binders</td>
</tr>
<tr>
<td>1515</td>
<td>Kotwal</td>
<td>Junctional Tourniquets</td>
</tr>
<tr>
<td>1545</td>
<td>Gerasci</td>
<td>Current TCCC Issues in Theater</td>
</tr>
<tr>
<td>1615</td>
<td>Butler</td>
<td>Wrap-Up</td>
</tr>
<tr>
<td>1630</td>
<td>Finish</td>
<td></td>
</tr>
</tbody>
</table>

## Dr. Frank Butler

- **TCCC Update**

## TCCC Award

- **Outstanding Contributions to TCCC**
TCCC Award
Previous Winners

- 2006 CAPT Frank Butler
- 2007 CAPT Steve Giebner
- 2008 Dr. Norman McSwain
- 2009 COL (R) John Holcomb
- 2010 MSG Harold Montgomery
- 2011 LTC Bob Mabry
- 2012 COL Russ Kotwal
- 2013 No award
- 2014 No award
- 2015 Mr. Don Parsons

A Preventable Death: 2003

- RPG explosion
- Bled to death from his right knee wound despite three field-expedient tourniquets
- “A picture is worth 1000 words”
- This one was worth 1000+ lives

Saving Lives on the Battlefield I (2012)

- Surveys of prehospital care in Afghanistan
- Combined Joint Trauma System/USCENTCOM team
- Directed interviews with hundreds of physicians, PAs, and combat medical personnel in combat units
- Col Stacy Shackelford
- COL Erin Edgar
- COL Russ Kotwal (II)

Army Chief of Staff Approves TCCC as a Warrior Task

Warrior Tasks and Battle Drills (CSA approved 8 Jun 15)

- Battle Command
- Crew Resource Management
- Medical Support
- Sustainment
- Field Training Exercises
- Operational Assessments
- Combat Camera
- Medical Support
- Tactical Communications
- Tactical Medical Operations

Rafael A. Rodriguez

Building Tomorrow’s Leaders Today
**Care Under Fire Graphics: Life-Threatening Bleeding**

**Tactical Combat Casualty Care: Leadership Lessons Learned**

**THOR 2016**

Frank Butler, MD
20 June 2016

---

**Fluid Resuscitation from Hemorrhagic Shock: 2014**

“The historic role of crystalloid and colloid solutions in trauma resuscitation represents the triumph of hope and wishful thinking over physiology and experience.”

LTC Andre Cap
J Trauma, 2015

There is an increasing awareness that fluid resuscitation for casualties in hemorrhagic shock is best accomplished with fluid that is identical to that lost by the casualty - whole blood.
TCCC Fluid Resuscitation for Hemorrhagic Shock: 2014

Fluid Resuscitation for Hemorrhagic Shock in Tactical Combat Casualty Care
TCCC Guidelines Change 14-01 - 2 June 2014
Frank E. Butler, MD; John S. Holcomb, MD; Martin A. Schreiber, MD; Ross S. Kotwal, MD; Donald A. Jenkins, MD; Howard H. Champion, MD; FACSIM; FACS; FES; Kirk A. Capo, MD; Joseph J. Dubose, MD; Warren C. Dick, MD; Gino F. Zordal, MD; Namens F. McManus, MD; FACSIM; Jeffery W. Tinsley, MD; Lorene H. Blackbourne, MD; Don T. Stockinger, MD; CDR Geir Strandenes; MD; Jeffrey A. Dailey, MD

2000 cc blood loss

Updated Fluid Resuscitation Plan
Order of precedence for fluid resuscitation of casualties in hemorrhagic shock

1. Whole blood
2. 1:1:1 plasma:RBCs:platelets
3. 1:1 plasma and RBCs
4. (tie) Plasma (liquid, thawed, dried) or RBCs alone
8. Hextend
9. (tie) Lactated Ringers or Plasma-Lyte A

Butler et al – JSOM 2014

What do you mean you don’t have a whole blood program!!

Reduced killed in action rate associated with pre-hospital blood product transfusion during air ambulance evacuation in combat operations in Afghanistan
MHSRS August 2016
Col Stacy Shackelford, Deborah J. del Junco, PhD, LTC Nicole Powell-Dunford, LtCol Edward Mazuchowski, Jeffrey T. Howard, PhD, COL (Ret) Russ S. Kotwal, LTC Jennifer Gurney, CAPT (Ret) Frank Butler, COL Kirby Gross, CAPT Zsolt Stockinger

Table 2. Medevac Study Population Post-treatment Characteristics & Outcomes

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Pre-hospital</th>
<th>Post-hospital</th>
<th>p value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Died (RIA + DOW) within 24 hours of MEDEVAC take-off from POI (%)</td>
<td>2 (3.8%)</td>
<td>64 (22.4%)</td>
<td>0.003*</td>
</tr>
<tr>
<td>Died (RIA + DOW) within 30 days (%)</td>
<td>5 (9.4%)</td>
<td>77 (26.9%)</td>
<td>0.005*</td>
</tr>
<tr>
<td>Transaminic Acid (TIA) (%)</td>
<td>48 (96.8%)</td>
<td>100 (96.9%)</td>
<td>0.003*</td>
</tr>
<tr>
<td>Documented shock (SBP&lt;90, HR&gt;120 or shock index &gt;0.8) upon ED arrival (%)</td>
<td>N=52</td>
<td>N=83</td>
<td>0.110</td>
</tr>
<tr>
<td>Massive Transfusion (&gt;10 units/24hrs) (%)</td>
<td>40 (75%)</td>
<td>115 (424%)</td>
<td>&lt;0.001*</td>
</tr>
<tr>
<td>ISS: Median (IQR)</td>
<td>29 (17, 36)</td>
<td>24 (17, 36)</td>
<td>0.179</td>
</tr>
<tr>
<td>AIS Score indicating torso hemorrhage (%)</td>
<td>22 (41.5%)</td>
<td>108 (37.8%)</td>
<td>0.646</td>
</tr>
</tbody>
</table>

*Statistically significant at <0.05 level by Fisher’s exact test.

TCCC Red/Green Chart: Opportunities to Improve

<table>
<thead>
<tr>
<th>Opportunity</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continuously Updated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Messaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Rapid Fielding Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCCC Training Standardized and Mandated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician TCCC Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DoD-FDA Panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCCC Documentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

TCCC UPDATES

109
TCCC Lessons Not Quite Learned - Yet

1. Medical Rapid Fielding Initiative

“8. Unit equipment sets and supporting medical logistics systems have not kept pace with evolving pre-hospital care TCCC guidelines. Out-dated items remain within the supply chain and newly required items have not yet been incorporated into standard configurations.”

Butler, Smith Carmona
J Trauma 2015

Implementing and preserving the advances in combat casualty care from Iraq and Afghanistan throughout the US Military

Frank K. Butler, MD, David J. Smith, MD, and Richard H. Carmona, MD, San Antonio, Texas

“The US Military had not effectively sustained many of the lessons learned from past conflicts and went to war in Afghanistan without wide availability of tourniquets, without modern battlefield analgesics, without prehospital plasma, and without trauma care guidelines designed specifically for use on the battlefield. Hemostatic dressings had not yet been developed and fielded. There was no military deployed trauma system, no Department of Defense trauma registry (DoDTR), no weekly worldwide trauma teleconferences to review treatments and outcomes for all casualties occurring in the preceding week, and no Committee on Tactical Combat Casualty Care (CoTCCC).”

Preventable Adverse Outcomes

December 2013:
- SOF Operator suffered shock from junctional hemorrhage
- His unit did not field junctional tourniquets
Preventable Adverse Outcomes

Late 2015 – Somewhere in Theater:
- SOF unit on patrolling with host nation forces
- dIED attack with 5 casualties
- 1 died KIA from lower extremity junctional hemorrhage
- His unit did not field junctional tourniquets

Junctional Hemorrhage and Prehospital Time after Injury
Highlighting the Need for Novel Strategies to Control Complex Sources of Hemorrhage and Temporize Survival to Definitive Care

Alarhayem, A. Johnson, M. Shackelford, S. Butler, F. Eastridge, B

Background
- Exsanguination remains the leading cause of mortality after injury.
- With the widespread use of tourniquets, junctional hemorrhage surpassed extremity bleeding as the leading cause of death from external hemorrhage on the battlefield.

Key Findings
- Risk of death was increased with AIS injury grades of junctional injury
  - Increasing severity of anatomic disruption associated with more significant hemorrhage
- Patient mortality with high grade junctional injury was high even with prehospital times ≤ 30 minutes
TCCC Lessons Not Quite Learned - Yet

2. TCCC Training Standard

Finding from the Two CENTCOM/JTS Prehospital Care Assessments

- TCCC is not being implemented evenly across the battle space
- These variations are not just SOF versus conventional forces difference
- Why is this happening?
- We teach physicians ATLS (maybe) and then assign them to operational units and expect that they can effectively supervise medics who have been taught battlefield trauma care based on TCCC concepts.

Saving Lives on the Battlefield I (2012) and II (2013)

- Surveys of prehospital care in Afghanistan
- Combined Joint Trauma System/USCENTCOM team
- Directed interviews with hundreds of physicians, PAs, and combat medical personnel in combat units
- COL Russ Kotwal (I)
- COL Samuel Sauer (II)

Non-Standard TCCC Courses

- Many “TCCC” courses – aren’t!
- Incorrect messaging
  – Instructor drift
  – “Never take off a tourniquet in the field”
- Incorrect messaging has been DIRECTLY associated with adverse outcomes
- Inappropriate training
- Vendor-supplied training is expensive

Preventable Adverse Outcomes

December 2013:
- One Special Operations member suffered a leg amputation from prolonged tourniquet use – only amputation from tourniquet use in US forces
- Unit members had been told never to take off a tourniquet in the field at their “TCCC” course. Tourniquet was left on for over 8 hours.
- The same member was put into pulmonary edema at a foreign medical facility from getting 9 liters of NS during resuscitation from hemorrhagic shock – where are the JTS CPGs? (Non-CENTCOM AOR)
Do You Really Know What Your Medics Are Learning?

U.S. doctor sanctioned for ‘abhorrent and abnormal’ troop training

- “Shock Labs”
- “Cognition Labs”
- Arterial Blood draws
- Sternal IO insertion on volunteers
- Regional blocks by non-medics

TCCC Training

- In the absence of a standard TCCC course with a professionally developed curriculum, "TCCC Training" in the DoD can wind up being an hour of PowerPoint slides or 11 days of inappropriate training - or anything in between.
- Who is responsible for assuring the content and quality of the course?

Joint Trauma System White Paper to Service SGs

- Outlines the problem
- Documents the bad outcomes from non-standardized TCCC training
- Recommends that we use the JTS-developed TCCC curriculum as taught through NAEMT

NAEMT Course Advantages

- They use the JTS curricula
- They QA their instructors.
- Have a system for establishing training sites
- Less expensive than commercial training vendors.
- Certification card at the end of the course.
- NAEMT registry of all who complete the course.
- Options:
  - Bleeding Control
  - Law Enforcement First Responder
  - Tactical Combat Casualty Care – AC
  - Tactical Combat Casualty Care - MP

Tactical Combat Casualty Care: Beginnings

Wilderness Medical Society
TCCC Preconference
30 July 2016

Dr. Brad Bennett

Tactical Management of Wilderness Casualties in Special Operations

Wilderness and Environmental Medicine
1998
Butler and Zafren, eds
TCCC Trademark Issues

- Provisional trademark on “Tactical Combat Casualty Care (TCCC)” granted to private individual in 2012
- No association with JTS or CoTCCC
- Misrepresenting TCCC approval of equipment

TCCC Trademark Issues

- Cease and desist letters to locations teaching NAEMT-taught TCCC courses

TCCC Knowledge Products

- TCCC Guidelines
- TCCC Curricula – Medical and All Combatant
- TCCC web sites – MHS/NAEMT/SOMA/JSOM
- TCCC Chapters in PHTLS 8 (Military)
- TCCC Change Papers
- TCCC Article Abstracts and Bibliography
- TCCC “Bulletized” - pending
- TCCC Mobile – pending
- TCCC Handbook - pending
- TCCC Section in Up-To-Date?

danielle.m.davis.civ@mail.mil

TCCC Handbook PDF First – Then App

- TCCC Algorithms
- Abbreviated Guidelines
- Equipment lists
- DD 1380 and AAR Forms
- Triage Categories – JTS Examples
- Kotwal/Monty planning chapter - abbreviated
- Nine line
- Single page drug reference
- Videos on procedures
- Video of when to do the procedures
An Eight Year Experience with Prehospital Tourniquets at a Civilian Level I Trauma Center


From the Departments of Surgery and Emergency Medicine
The Center for Translational Injury Research
University of Texas Health Science Center
Houston, Texas

Conclusions

- Tourniquets can be used safely for every day civilian trauma
- Pre-hospital application is beneficial
- Civilian guidelines should include early tourniquets for major limb trauma vs pressure dressings

*FKB: Mortality from HS INCREASES BY 360% when indicated tourniquets are not applied until the trauma center

Results: TIMING

- Hypothesis 3: Pre-hospital placement decreases death from hemorrhagic shock

<table>
<thead>
<tr>
<th></th>
<th>Pre-hospital (n=252)</th>
<th>Trauma Center (n=29)</th>
<th>P value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Arrival Systolic BP</td>
<td>125 (100, 145)</td>
<td>101 (86.6, 123)</td>
<td>&lt;0.01</td>
</tr>
<tr>
<td>Δ Systolic BP</td>
<td>11 (-12, 24)</td>
<td>-10 (-15, 26)</td>
<td>0.03</td>
</tr>
<tr>
<td>Arrival HR</td>
<td>98 (82, 115)</td>
<td>110 (90, 129)</td>
<td>0.16</td>
</tr>
<tr>
<td>Arrival GCS</td>
<td>15 (14, 15)</td>
<td>15 (3, 15)</td>
<td>0.17</td>
</tr>
<tr>
<td>% CAT+ (n)</td>
<td>34 (85)</td>
<td>55 (16)</td>
<td>0.02</td>
</tr>
<tr>
<td>Mortality</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>All cause</td>
<td>5%</td>
<td>14%</td>
<td>0.07</td>
</tr>
<tr>
<td>Hemorrhagic shock</td>
<td>3%</td>
<td>14%</td>
<td>0.01</td>
</tr>
</tbody>
</table>

Questions?

TCCC Red/Green Chart: Opportunities to Improve

<table>
<thead>
<tr>
<th>Item</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>Evidence-Based</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Continually Updated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Strategic Messaging</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Medical Rapid Fielding Plan</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCCC Training Standardized and Mandated</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Physician TCCC Training</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DoD-FDA Panel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TCCC Documentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Changes to the TCCC Guidelines

TCCC Action Items: 2013

- TCCC Casualty Card
  - Kotwal
- Vented chest seals
  - Butler/CAPT Don Bennett
- Junctional tourniquets
  - Kotwal
- Triple-Option Analgesia
  - Butler

TCCC Action Items: 2014

- Alternate hemostatic dressings
  - Bennett
- Fluid resuscitation
  - Butler
- Updated tourniquet use guidelines
  - Shackelford

TCCC Action Items: 2015

- Zofran in for Phenergan
  - Onifer
- CricKey for Surgical Airways
  - Mabry
- Abdominal Aortic Junctional TQ
  - Not recommended
- XStat
  - Sims/Bowling

TCCC Action Items: 2016

- iTClamp
  - Not Recommended
- Pelvic Binders
  - Pending - Shackelford
- Comprehensive Review
  - Pending - Montgomery

TCCC Action Items: 2016

- iGel as SGA of choice in TCCC?
  - Otten
- Increase ketamine initial dose?
  - Fisher?
TCCC – Potential Action Items:

• Reword positioning for NDC (IA Partner)
  – Injured side up
  – Blood lower
• Foley balloon catheter treatment of head and neck bleeding (Weppner 2013)
  – XStat?
  – Hemostatic dressing plus iTClamp?

TCCC – Potential Action Items:

• Improved options for decompression of tension pneumothorax
  – Finger thoracostomy
  – Veres needle (Peter Rhee)
  – ThoraQuik
  – 10 Fr Vygon thoracic trocar (IDF)
  – Donaldson Needle
  – Other?

TCCC – Potential Action Items

• Manual compression of abdominal aorta for junctional hemorrhage if no junctional tourniquet is available and CG is not working?
• Review the use of c-collars and spinal immobilization in TCCC
• Traction splinting recommendations?
• What else?

Future Technology Items

After FDA Approval and/or More Studies

• ResQFoam
• Compensatory Reserve Index Monitor OR POI lactate monitoring OR tissue O2 sat

After USAISR Testing

• AAJT
• What else?

TCCC Curriculum 2017

• New material on the Raid on Entebbe – compare to the Byers MOH operation
• More emphasis on tightening the CAT encircling band?

Changes to the TCCC Curriculum
TCCC Curriculum 2017

- Suggestions for TCCC training beyond the 2-day JTS course?

TCCC Training: Options

- 2-Day TCCC-MP Course: the Foundation
- Buddy training – anatomy demonstrations
- Trauma Lanes
- Battle Drills
- Trauma center rotations
- Part-Task Trainer (Airway Sim, etc)
- Cadaver training
- Live tissue training
- High-End Simulators
- Hyper-realistic Training
- Role players with cut suits
- Computer-Generated Scenarios

Surface Landmarks for Cricothyrotomy

Beneath the Surface Landmarks

Locating the Cric Skin Incision with a Dotted Line

All articles published in the Journal of Special Operations Medicine are protected by United States copyright law and may not be reproduced, distributed, transmitted, displayed, or otherwise published without the prior written permission of Breakaway Media, LLC. Contact Editor@JSOMonline.org.
**Alternate Site for Needle Decompression**

- An acceptable alternate site is the 4th or 5th intercostal space at the anterior axillary line.
- The 5th intercostal space is located at the level of the nipple in young, fit males.
- The AAL is located at approximately the lateral aspect of the pectoralis major muscle.

---

**TCCC Curriculum 2016**

- IV medication skill sheets and practical
- Voice-over presentations for JKO?
  - Engle/Gross

*What else?*

---

**Finish**

Thank You!
Inside this Issue:

- Case Report: Skeletal Traction for Proximal Femur Fracture
- Case Report: Lower Extremity Compartment Syndrome in Airborne Operations
- Case Report: Pectoralis Major Injury During Airborne Training
- Case Report: Thrombotic Microangiopathy Syndrome
- Evaluation of Pneumatic-Tourniquet Models
- \( F_{102} \) Delivered by Ventilator With Oxygen Concentrator
- Ballistic Protection at Active Shooter Events
- Junctional Tourniquet Evaluations
- Schistosomiasis in Nonendemic Populations
- Editorial: TCCC Standardization
- Ongoing Series: Clinical Corner, Infectious Diseases, Injury Prevention, Law Enforcement and Tactical Medicine, Prolonged Field Care, SOFsono Ultrasound Series, Special Talk, There I Was, Book Review, TCCC Updates, TacMed Updates, and more!

Dedicated to the
Indomitable Spirit
and Sacrifices of
the SOF Medic

A Peer-Reviewed Journal That Brings Together the Global Interests of Special Operations’ First Responders