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TITLE: Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Past, Present and Future

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14. ABSTRACT

Study Design: This observational study will be devoted to the analysis of existing (retrospective) data extracted from the Joint Trauma System (JTS) Role 2 Registry (Aim1). A comprehensive inventory and description of current R2 pre-deployment training programs and individual experiences will be conducted, an evidence-based program will be created and implemented to optimize provider performance of combat casualty care.

Objective: Describe and understand impact of R2 utilization during OEF and beyond, with emphasis on patient outcomes and provider competency.

Specific Aim 1 – Descriptive study of all available information for combat casualties in Afghanistan.

Specific Aim 2 – Identify the ideal provider training and competency assessment, sustainment and evaluation for medical staff deployed to R2 environment.

15. SUBJECT TERMS

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1. **INTRODUCTION:**
There exists a continued lack of evidence about the impact of Role 2 medical resources in the combat theater. Although a Role 2 database has been in place since 2008, no systematic evaluation for these data has been conducted. Without analysis of this information, military planners and medical leaders will be unable to best allocate Role 2 resources in future operations. Furthermore, the clinical competencies required for each medical team member to function optimally in this environment have yet to be clearly defined or systematically supported across the Tri-Services.

2. **KEYWORDS:**
Role 2 (R2)
Role 3 (R3)
Combat Casualty Care (C3/CCC)
Department of Defense Trauma Registry (DoDTR)
Operation Enduring Freedom (OEF)

3. **ACCOMPLISHMENTS:**

What were the major goals of the project?
CY17 Goal – Expand Role 2 database to all deployed units to OEF/OIF
   a. Obtain all identified data other than R2R
   b. Create repository within DoDTR for these data
   c. Conduct analysis and contrast by Role 2 unity and phase of conflict (entry, surge, and sustainment)

CY18 Goal – Implement TriService training and sustainment standard
   a. Cross-walk all training programs for R2 team members
   b. Develop metrics for evaluating skill and knowledge retention

What was accomplished under these goals?
Using the SOW, goals accomplished under this project are outlined below:

Specific Aim 1 - Initiate R2 Registry (R2R) analysis and conduct comprehensive review of training literature, individual experiences, and TriService training resources.

Subtask 1: Submit documents for HRPO approval.
The research team received HRPO approval for the following protocols:
H-15-010 "Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Past, Present and Future"; HRPO assigned A-number: A-19116.
H-16-009 "Analysis of Medical Interventions in the Combat Environment Related to Deployed Hospital Care"; HRPO assigned A-number: A-19116.3.
H-16-022 "Evaluation of Healthcare Systems Training for Combat Casualty Care Skills"; HRPO assigned A-number: A-19116.2.
H-16-023 "The R2 Experience: Comparing the JTS R2 Registry and Surgeon Case Logs from 2008 to 2017"; HRPO assigned A-number: A-19116.5.

H-16-026 “Analysis of Trends in Injury Severity and Mortality and Contributing Factors in Operations Enduring and Iraqi Freedom (OEF/OIF/OND)”**;** HRPO assigned A-number: IRB Log #M-10563.
Old Dominion University “Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Past, Present and Future; HRPO assigned A-number: A-19116.7b.
Old Dominion University “The Development of an Innovative Role 2 CPG-Based Trauma Knowledge-Assessment Instrument and Training Materials That Utilize Deliberative Practice and Mastery Training”**;** HRPO assigned A-number: A-19116.7a.
H-17-014 NR “TIP-TOP Pilot Study” (Fort Carson, CO)**;** HRPO assigned A-number: A-19116.
H-18-001 “A Comprehensive Evaluation of Patients Treated at Role 2 Surgical Units in Afghanistan”; HRPO assigned A-number: IRB Office No. M-10723.
IACUC Protocol: “A Retrospective Review of U.S. Military Working Dogs Treated by Role 2 Surgical Teams in Afghanistan”; HRPO assigned A-number: NA.
PI-16-002 “Redefining and Restoring the USAISR Preceptorship Program”; HRPO assigned A-number: NA.

Subtask 2: Identify sources and initiate process to obtain data other than R2R.
The research team identified the following data sources: Joint Trauma Systems; DoDTR; Role 2 Database; Golden Hour Database (TACEVAC, DoDTR, and AFME); TACEVAC Registry; United Kingdom Joint Theater Trauma Registry; Unit specific databases: 59th Medical Wing Aeromedical (AE) and Critical Care Air Transport Team (CCATT) database; 160th SOAR Para-rescue Team registry.

The research team also identified a unique Iraq data set from July 2015-2016. This dataset was from LTC Christina Hahn and included n=314 Iraqi trauma patients. This unique data set represents the only “entry operation” available for a Role 2, as the JTS registry did not include R2 until 2008 timeframe, well after entry operations were concluded in OIF/OEF. This dataset was entered into a Role 2 database shell, analyses were completed, and manuscript was written and submitted to Military Medicine 2018. Lessons learned from LTC Hahn’s experience and recommendations were provided to CDID Combat Developers and logistic packs were tested (AWA 17 exercise OCT 2016).

Subtask 3: Describe all data available in R2R, conduct gap analysis
All data available for OEF in the Role 2 dataset was described in the manuscript entitled “Evaluation of Role 2 (R2) medical resources in the Afghanistan combat theater: initial review of the joint trauma system Role 2 registry”. Gap analysis was addressed in the manuscript conclusion section. Dozens of subsequent analyses have been conducted on unique elements of the database. Refer to manuscripts and other dissemination products for these analyses. Topics include, but are not limited to: analysis of the Case Fatality Rates/Died of Wounds for OIF/OEF compared to Vietnam, transport from point of injury to Role 2, transport from R2 to R3, analysis of time at R2, patients treated in 2016 at a R2 in Iraq, pediatric patients treated at R2, use of blood (components and fresh whole blood, analgesia provided prior to R2, airway adjuncts prior to R2, all patients who died, orthopedic/ocular injuries and interventions, development of a surrogate injury severity score (Combat Mortality index) due to lack of ISS in dataset, brain injured patient, emergent resuscitative thoracotomy, and initial evaluation of R3 outcomes and ICU patients.

Subtask 4: Compile and analyze all "lessons learned" regarding R2 operations during OEF/OIF Findings from Role 2 manuscripts described the lessons learned regarding Role 2 operations. Army Centers for Lessons Learned is an active partner in this project to record identified lessons learned as analyses continue.

Subtask 5: Describe all training assets available for R2 team members

Sub-contractor IVIR, Inc completed several activities to understand all military and civilian available pre-deployment training assets. IVIR's activities included observational trips to training locations, literature searches, and discussions/meetings with subject matter experts. These comprehensive findings were described in the "MATRIX". A literature review concerning the elements of Role 2 training and combat casualty care readiness included assessment parameters relative to proficiency, competency, and mastery models.

This information was supplied to the Defense Medical Readiness Training Institute Director, Col Michael Charlton in 2017 to support the development of a joint pre-deployment curriculum and course. This effort to develop a joint course was directed by the Education and Training Subcommittee of the Committee of Surgical Combat Casualty Care, funded by JPC-6 (PI: Shackelford). As a result of the collaboration with the Role 2 study, providing the results of the year-long compilation of the existing course information and literature review of best practice saved a redundant effort by DMRTI staff and expedited course development.

Subtask 6: Conduct survey of deployed R2 members for personal training experience, confidence upon deployment The research team completed a survey for Army nurses and medics that were deployed to a Role 2/Role 3 to identify the pre-deployment training (individual/team) they received during their recent deployments (2001-2018). The survey study identified available training these Army Role 2 team members (APNs, PAs, RNs, LVNs, Medics and Techs) attended. Of the 22,337 potential participants, there were 1,181 respondents (5.3%); of those, 696 met inclusion criteria. The research team collated the results from this survey and cross-walked the responses to identify current training standards and areas of need. Using the MATRIX created by IVIR, the training programs were cross-referenced. A result of the survey identified that Role 2/Role 3 teams often cross-trained with NATO and Tri-services. Continue efforts for ongoing collaboration with NATO and Tri-services will allow the research team to identify potential training gaps across deployed Role 2 teams. Training survey results were presented at the 2018 MHSRS and will be described in an upcoming manuscript currently in draft. Findings have been shared with Army Nurse Corps leadership to support current policy decision for improving nursing/medic deployment readiness. This is the largest survey of non-physician pre-deployment training to date.

Subtask 7: Based on literature review, recommend best practice for R2 training

As reported by IVIR, Inc., the literature review was completed and identified general education barriers to training that potentially would apply to combat casualty care. Three generic categories were identified; situational, institutional, and dispositional. Situational is related to time available, financial constraints, other responsibilities. Institutional is related to practices and procedures that exclude or discourage participation, limited course offerings, or courses offered at inconvenient times or locations. Dispositional refers to attitudes and opinions toward learning and perceptions of oneself as a learner. In the study certain populations were more likely to face barriers than others: these barriers will be applied to the gap analysis. In addition, there is a documented phenomenon, "Training breeds training" that suggests participation in training creates a perception for the need of more training. This principle has been observed in combat casualty training. The literature review and updates were included within the literature traceability matrix.

These principles of optimizing training are being applied to a parallel effort funded by the Army RAD 2 program through the task area. A pilot program for pre-deployment readiness training was implemented at the Army Burn Center and the BAMC Level 1 Trauma Center in 2018. To date approximately 42 R2/3 personnel have attended the course.

Specific Aim 2 – Develop R2R Performance Assessment Dashboard

Major Task 2

Subtask 1: Create metrics to evaluate R2 outcomes and team performance &
Subtask 3: Track training and sustainment programs for R2 members

During the course of this project the Joint Training and Education Division (JTED) was created by NDAA 2017 and will provide guidance on readiness training and education. Within JTED, the Defense Medical Readiness Training Institute (DMTRI) has been tasked to develop, implement, and sustain standardized training courses. IVIR's literature review and MATRIX was provided to DMRTI for further collaboration. Additionally, we have ongoing collaborations with the Knowledge, Skills, and Ability (KSA) project. The KSA project aims to identify the KSA's for all provider types. The KSA project was funded within the same year as the Role 2 grant. Currently, the KSA project has focused on defining knowledge, skills, and abilities for surgeons. We are currently addressing the gap in identify KSAs for other provider types such as RN, LVN, Medics, and Technicians. We continue to work closely with all training departments/ projects involved in developing training and performance metrics. Due to the current climate and structural changes within the government organizations, developing standardized training has been challenging. PI Mann-Salinas serves on the CoSCCC Education and Training subcommittee with DMRTI/JTETD Director (Charleton) and KSA Lead (Elster) to ensure goals of all efforts are closely aligned.

Subtask 2: Develop DoDTR report for near-real time feedback to deployed teams

The Medical Situation Awareness Tool (MSAT) used within CENTCOM provides medical and logistical awareness for combat casualties in the AO. The existing MSAT is an ~ 80% solution for this deliverable. A shortcoming of the DoDTR and MSAT is the inability to track providers, provide training, and determine geospatial awareness of medical assets and patient flow. However, within the JTS, process improvement recommendations are currently underway to improve real-time situational awareness of medical assets deployed world-wide and track all patient movement and outcomes. In concert with JTS, this deliverable will ultimately be met.

Specific Aim 3 – Expand R2 database to all deployed units to OEF/OIF

Major Task 3

Subtask 1: Obtain all identified data other than R2R

Received IRB approval in 2017 to obtain identifiable data from the Role 2 Database and DoDTR. However, we have not yet received the dataset, pending JTS leadership review and approval for release. Last status update from JTS was OCT 2018.

Subtask 2: Create repository within DoDTR for these data
A repository within the DoDTR has been created and now includes the Role 2 dataset. A shortcoming of the Role 2 data recently entered into the DoDTR is that some data from the Role 2 may have not been entered into the DoDTR. Therefore, our current Role 2 dataset continues to be a more complete dataset. Ongoing collaboration with JTS to make the research R2 data available to investigators.

Subtask 3: Conduct analysis and contrast by R2 unit and phase of conflict (entry, surge, and sustainment)
When this proposal was written, the research team was unaware of the limitations of the available Role 2 data. One of the limitations within this dataset was that R2 data correlating with the phase of conflict (entry, surge, and sustainment) was not documented; Role 2 data were not collected until 2008, well after entry and surge operations. As noted previously, personal records from LTC Hahn provided the only R2 "entry" data and this manuscript is under review at Military Medicine. However, the research team plans to complete this deliverable by comparing and contrasting the Role 2 units 'by year', rather than by the 'phase of conflict'.

Specific Aim 4 – Implement TriService training and sustainment standard
Major Task 4
Subtask 1: Cross-walk all training programs for R2 team members
The cross-walk of all training programs for Role 2 team members was completed by IVIR, Inc. Eleven relevant categories were identified for the training program traceability MATRIX, to include: general course information, course details, course content, instructional methodologies, course type, course availability, assessment criteria, requirements, funding, alignment with clinical practice guidelines, and alignment with tactical combat casualty care. From these 11 parent categories, subcategories were then generated to capture the appropriate data elements of interest; 40 independent subcategories were identified. Training program research and traceability matrix were requested by and provided to the Committee for Surgery in Combat Casualty Care; Committee for Tactical Combat Casualty Care; Defense Medical Readiness Training Institute; Knowledge, Skills and Attributes Working Group, and the Army Trauma Training Detachment. Summarized results were presented at the 2017 MHSRS meeting.

Subtask 2: Develop and validate knowledge assessment tool for combat-related skills
Sub-contractor Dr. Parodi and her team at VMASC have developed the knowledge assessment tool/test for combat-related information and are in the process of validating the tool. As provided by VMASC, the Knowledge Acquisition and Testing System (KATS) provides a platform that supports all types of educational materials on the topic of military trauma patient management content based on the concepts and content from the Clinical Practice Guidelines (CPGs) developed by subject matter expert teams who used data from the Joint Theater Trauma Registry (JTTR) to develop evidence-based guidelines for care. KATS is comprised of a testing or assessment capability to assess the level of core trauma knowledge. This first release of KATS focuses on Nursing care. Surgeon and physician knowledge tests are being developed by CAPT Elster's KSA team, in concert with the American College of Surgeons. The primary goal of this study is to validate the Knowledge Acquisition & Testing System (KATS) as a reliable

and valid instrument to use for testing the level of military trauma knowledge for DOD clinicians based on the JTS data-driven CPGs and consensus KSAs.

Subtask 3: Generate universal combat casualty skills for each provider type
Dr. Susan Boyer (VNIP – VT Nurses in Partnership Chief Executive) and our team have generated the universal combat casualty care skills for non-physician clinicians based on the Army Burn Center TIP-TOP program (Transition in Practice Towards Optimal Performance staff development program based on VNIP). Dr. Boyer and the team developed a program support document (guide book and reference/workbook) that provides content explanation, demonstration, and a great source for additional reference material). The materials are all aligned with the KSA domains. Physician knowledge, skills, and surgical ability is being defined and developed by the KSA project group as mentioned previously.

Subtask 4: Develop and implement metrics for evaluating skill and knowledge retention
The KSA group has been heavily focused on physician skill and metrics, therefore our project has been focused on filling the gap by focusing on RN, LVN, and Techs. The research team developed a paper-based competency assessment tools (CATs) for RN, LVN, and Techs to track skills and knowledge related to combat casualty care for nurses and medics. Using the retrospective Role 2 data analysis and the TIP-TOP/VNIP framework, the research team identified realistic, clear, and concise performance objectives applicable to the CAT for realistic patient scenarios. The CAT cross-walk accounted for Army, Navy, and Air Force pre-deployment competency standards for Tri-service applicability. Two documents have been created Combat Casualty Care Tool (CCC) and the Austere Care Tool. These tools allow for tracking the requirements for individual readiness defined by the KSA working group. Ultimately this information will become digital and automated.

Specific Aim 5 – Implement TIP-TOP Pilot study at a military treatment facility (MTF)
Major Task 5
Subtask 1: Determine the number of preceptors and nurse trainees
Pre-implementation process completed - RN Nurse Coordinator at Evans Army Community Hospital (EACH) in Colorado Springs is actively worked on determining the number of preceptors and nurse trainees. The number of preceptors and nurse trainees currently identified were (n=117). For this study, priority nursing units include 1) emergency department, 2) intensive care unit, and 3) medical surgical section. Preceptors within these units are tracked and trained upon in-processing into facility.

Subtask 2: Identify and train 100% current nursing preceptors (n = x preceptors) on TIP-TOP
Pre-implementation process completed – RN Nurse Coordinator at EACH was actively working on identifying and training all nursing preceptors. Nursing preceptors currently identified (n=67).

Subtask 3: Identify and orient all new nurses on TIP-TOP (n = x nurse trainees)
Orientation for all new nurses was initiated 01 October 2018. Data collection is ongoing.

Subtask 4: Collect data/outcome measures on completeness of the employee CAF folder, duration of preceptorship, and variation in competency

This process included pre-implementation and consisted of Emergency department (n=20); Intensive care unit (n=19); Medical surgical (n=28). Data will be analyzed post 6-months from implementation (~March 2019).

Subtask 5: Perform data analysis to evaluate critical thinking, reduce documentation burden, increase the accuracy and completeness of competency documentation, and provide a method to effectively track competency progression.

Ongoing deliverable. Target date for completion (2019).

Subtask 6: Trouble shoot issues with implementing the transition program or process.

Since initiating the TIP-TOP Pilot study at EACH, issues with implanting the TIP-TOP pilot included military leadership challenges (e.g., leadership turnover due to military moves). Additional challenges result from staffing shortages and unit leader adoption.

Milestone: Provide lessons learned on TIP-TOP to standardize and improve nurses transitioning into specialty practice, and to provide a method to effectively track competency progression.

Ongoing deliverable. Target date for completion (2019).

Specific Aim 6 – Evaluate long term outcomes of patients treated at R2 facilities post Performance Assessment Dashboard and Standardized Competency implementation

Major Task 6

Subtask 1: Compare outcomes for patients treated at Role 2 after implementation of standardized pre-deployment training program

Due to the decreased OPTEMPO, our original plan to implement a prospective project in theater would not be feasible. Therefore, we identified alternate opportunities to complete this deliverable. The Brooke Army Medical Center, level 1 trauma center, is a premier trauma training site due to its access to trauma patients, simulation center, and high acuity nursing units. The USAISR Burn Center (within BAMC) has conducted pre-deployment clinical exposure training, however, a formalized program had not been implemented. The project team collaborated with the Burn Center & BAMC and provided the pre-deployment CATs to help guide training. Role 2 patient injuries and demographics, from prior manuscript, were used to develop realistic simulated Role 2 patient scenarios that could not be experienced within a civilian trauma care environment. Based on the CATs performance metrics skills, CPGs, and knowledge assessment questions were defined that cover the content for RN, LVN, and Tech within the Emergency Department/Intensive Care, Operating Room, and Medical Surgical Specialty. The Pre-deployment clinical exposure training program evaluates effectiveness of training by evaluating clinical readiness with trauma competencies before and after clinical exposure training. The training program has also opted to utilize the TIP-TOP/VNIP framework which has provided them the ability to evaluate performance and ensure leaders/preceptors conducting training are trained on fostering critical thinking and understand their role. Unfortunately, non-military floor nurses are not familiar with and are uncomfortable with validating pre-deployment competencies, therefore our limitation for this project is that actual validation of performance cannot be completed. A secondary issue is that pre-deployer clinical exposure is 1-2 weeks which does not allow for computer access and full credentialing to independently care for patients. Fortunately, perceived readiness can be evaluated as well as information on their prior training experience. These data are being collected prospectively.

What opportunities for training and professional development has the project provided?
Several training opportunities were available to the team and consisted of one-on-one mentorship with Principal Investigator, Associate Investigators, consultants, collaborators and task area manager. Dr. Mann-Salinas (PI) provided Richelle Power with one-on-one mentorship at Evans Community Hospital to initiate the TIP-TOP pilot study. Dr. Susan Boyer with VNIP scheduled an onsite visit to San Antonio and provided a week of TIP-TOP training. Richelle Power came to San Antonio to attend Dr. Boyer's training. Ms. Power also had the opportunity to shadow burn center preceptor coordinators that currently use the TIP-TOP program. Additionally, Dr. Russ Kotwal (AI, consultant) provided Dr. Amanda Staudt (AI, epidemiologist) with an opportunity to present information about R2-related mortality at the Association of Military Surgeons of the United States November/December 2017. Dr. Kotwal provided Dr. Staudt with one-on-one mentorship and coaching to prepare the hour long educational presentation.

Professional development activities included attending and presenting at the following conferences:

- 2018 Association of Military Surgeons of the United States, San Antonio, TX
- 2017 Centre for Blast Injury Studies Networking/Research Event, London, UK
- 2017 Southern Region Burn Conference, Miami, FL
- 2018 Society of Critical Care Medicine, San Antonio, TX
- 2018 Tri-Service Nursing Research Symposium in San Antonio, TX
- 2018 BAMC Nurses Week, San Antonio, TX
- 2018 Southwest Texas Regional Advisory Council Conference, San Antonio, TX
- 2018 Military Health Systems Research Symposium in Kissimmee, FL
- 2018 Scientific Seminar at USAISR in San Antonio, TX

How were the results disseminated to communities of interest?
Results from this study were disseminated at research conferences, research events, and through manuscript publications to include the following:

- Association of Military Surgeons of the United States – National Harbor, Maryland
- 'Centre for Blas Injury Studies' Networking/Research Event – Imperial College London
- Southern Region Burn Conference – Miami, FL
- Society of Critical Care Medicine – San Antonio, TX
- American Burn Association – Chicago, IL
- Tri-Service Nursing Research Symposium - San Antonio, TX
- BAMC Nurses Week – San Antonio, TX
- Southwest Texas Regional Advisory Council - San Antonio, TX
- Military Health Systems Research Symposium - Kissimmee, FL
- Scientific Seminar – USAISR San Antonio, TX
- IDF Medical Corps - US Army and Airforce official visit to Israel

What do you plan to do during the next reporting period to accomplish the goals?

CY19 Goals – Evaluate long term outcomes of patients treated at Role 2 facilities using pending complete dataset from DoDTR with patient identifiers.
Develop a performance assessment dashboard in conjunction with the JTS as a component of a Joint Medical Operations Center.

Continue validation of the nursing Standardized Competency Tools in conjunction with the Army Burn Center predeployment readiness program.

During the next reporting period, the research team plans to continue disseminating information through publications and presentations.

4. **IMPACT:** Describe distinctive contributions, major accomplishments, innovations, successes, or any change in practice or behavior that has come about as a result of the project relative to:

   What was the impact on the development of the principal discipline(s) of the project? Nothing to Report

   What was the impact on other disciplines? Nothing to Report

   What was the impact on technology transfer? Nothing to Report

   What was the impact on society beyond science and technology? Nothing to Report

5. **CHANGES/PROBLEMS:** The research team experienced a delay with obtaining complete data set from JTS DoDTR with identifiable data (currently pending), however, the protocol was IRB approved December 2017. Without patient identifiers, outcomes following R2 transfer are unable to be evaluated.

6. **PRODUCTS FY 2018:**

   Poster Presentations.

   Epidemiology and outcomes of patients treated at Role 3 medical treatment facilities in Afghanistan

   A preliminary review of orthopaedic injuries and procedures performed at Role 2 facilities in Afghanistan

   Prehospital airway management and mortality in Afghanistan

   Deployed nursing competencies utilizing consensus combat casualty care domains

   A case series of US Military Working Dogs treated by Role 2 surgical teams in Afghanistan

   Traumatic cardiac arrest in Role 2 surgical units in Afghanistan

   Evaluation of pre-deployment training for army nurses and medics

Journal publications.

Boyer, S. Clinical Transition Framework: Efficient Solution for Transitional Support Systems, Nurse Leader, 2018

Lane, I; Stockinger, Z; Sauer, S; Ervin, M; Wirt, M; Bree, S; Gross, K; Bailey, J; Hodgetts, T; Mann-Salinas, E. The Afghan Theater: A Review of Military Medical Doctrine from 2008 to 2014. Military Medicine, 182, ¾:32, 2017

Boyer, S; Mann-Salinas, E; Valdez-Delgado, K. Clinical Transition Framework: Integrating accountability and coaching plans in professional practice development, *J for Nurses in Professional Development, 2018*

Kotwal, R; Staudt, A; Trevino, J; Valdez-Delgado, K; Le, T; Gurney, J; Sauer, S; Shackelford, S; Stockinger, Z; Mann-Salinas, E. A Review of Casualties Transported to Role 2 Medical Treatment Facilities in Afghanistan. Military Medicine, 183, ¾:134, 2018

Kotwal, R; Staudt, A; Mazuchowski, E; Gurney, J; Shackelford, S; Butler, F; Stockinger, Z; Holcomb, J; Nessen, S; Mann-Salinas, E. A US Military Role 2 forward surgical team database study of combat mortality in Afghanistan. J Trauma Acute Care Surgery, Volume 85, Number 3, 2018

Unrealized Potential of the US Military Battlefield Trauma System: DOW Rate is higher in Iraq and Afghanistan than in Vietnam, but CFR and KIA Rate are lower, *J Trauma and Acute Care Surgery, 2018*

Reeves, P; Auerbach, M; Le, T; Caldwell, N; Edwards, M; Mann-Salinas, E; Gurney, J; Stockinger, Z; Borgman, M. Analysis of Pediatric Trauma in the Combat Zone as a Needs Assessment to Inform Pre-Deployment Military Training, *Pediatric Critical Care Med, 2018*

Staudt, A; Savell, S; Biever, K; Trevino, J; Valdez-Delgado, K; Suresh, M; Gurney, J; Shackelford, S; Maddry, J; Mann-Salinas, E. En Route Critical Care Transfer from a Role 2 to a Role 3 Medical Treatment Facility in Afghanistan" Feature Article, April 2018

Staudt, A; Gurney, J; Valdez-Delgado, K; Suresh, M; Trevino, J; Le, T; Seery, J; Shackelford, S; Nessen, S; Mann-Salinas, E. Factors Associated with Trauma Patients' Length of Stay at Role 2 Facilities in Afghanistan, October 2009 to September 2014", J Trauma and Acute Care Surg, 2018

Hahn, C; Staudt, A; Brockmeyer, J; Mann-Salinas, E; Gurney, J. Characteristics of Iraqi Patients treated during Operation Inherent Resolve by a Forward Surgical Team. Military Medicine. Submitted 2018.

Gurney J; Staudt, A; Shackelford, S; Mann-Salinas, E; Le, T; Nessen, S; Cap, A; Spinella, P. Fresh Whole Blood is Associated with Improved Survival in Patients Treated by Forward Deployed Surgical Teams in Afghanistan. Transfusion THOR Supplement. Submitted 2018.

Other publications, conference papers and presentations. Nothing to Report

Website(s) or other Internet site(s). Nothing to report

Technologies or techniques. Nothing to report

Inventions, patent applications, and/or licenses. Nothing to report

Other Products Nothing to report

7. PARTICIPANTS & OTHER COLLABORATING ORGANIZATIONS

What individuals have worked on the project?

- COL (Ret.) Elizabeth Mann-Salinas, PhD, RN
- Susan Boyer, DNP; VNIP
- Nadine Baez; SynDaver
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- Col Ian Lane, DDS, UK
- Surg Capt. Rory Rickard, MD, UK
- COL Kyle Remick, MD
- COL John Oh, MD
- David Cannon, ACMLL
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- Lt Col Jacob Chen, IDF
- Lt Col Ariel Furer, IDF
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- CAPT Eric Elster, MD, USU
- Richelle Power, BSN, RN
- MAJ Meredith Hettinger, RN

Name: CPT Christy Lang
Project Role: Chief, Hospital Education
Researcher Identifier: NA
Nearest person month worked: 6
Contribution to project: Worked on the TIP-TOP Pilot study at Evans Army Community Hospital.
Funding Support: NA

Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
Nothing to report

What other organizations were involved as partners? Nothing to report

8. SPECIAL REPORTING REQUIREMENTS

COLLABORATIVE AWARDS: Nothing to report

QUAD CHART: Attached

9. APPENDICES: Attached journal manuscripts, posters, MATRIX, and survey.

Evaluation of Role 2 (R2) Medical Resources in the Combat Theater: Past, Present and Future

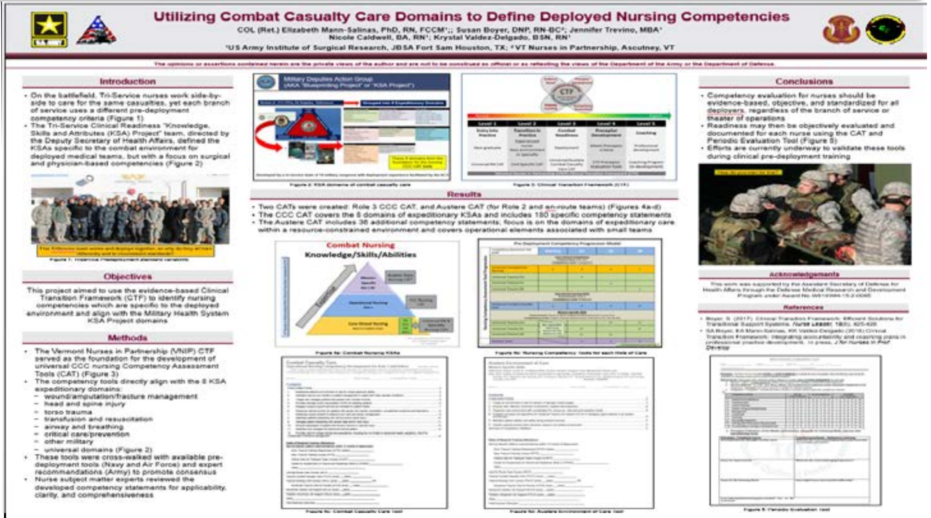
W81XWH-15-2-0085
PI: COL (Ret.) Elizabeth Mann-Salinas, PhD, RN
Sponsor: JPC-6

Task Area: Department of Trauma Outcomes and Systems Research
Org: USAISR/The Geneva Foundation
Geneva Award Amount: $3,540,354

Purpose: Describe and understand impact of Role 2 (R2) utilization during OEF, with emphasis on patient outcomes and provider competency

Aim 1: Descriptive study of all available information for combat casualties in Afghanistan.
Specific Tasks:
1) who – patients treated; clinician mix and pre-deployment training received;
2) what – injuries; mechanism of injury; procedures, interventions, products;
3) why – who received operative intervention, justification for over-flight to R3;
4) when – time from POI to R2, time spent at R2, R2-R3; period of unit deployment
5) where – location of R2 relative to POI, R3; terrain; AE support/assets available;
6) how – outcomes associated with R2 utilization

Aim 2: Identify the ideal provider training and competency assessment, sustainment and evaluation for medical staff (physicians, nurses, other licensed professionals, medics) deployed to the R2 environment. Specific Tasks:
1) Comprehensive description of current Tri-Service pre-deployment training programs and individual experiences
2) Systematic review of the literature to describe evidence-based training and sustainment programs for medical provider combat casualty care (C3) competencies
3) Define the ideal sustainable training and sustainment program for C3 competencies
4) Develop and validate a Tri-Service C3 competency development and sustainment program



Accomplishment: Finalization of evidence-based tools to document clinical competency for combat casualty care. Represents a collaboration with the KSA working group and alignment of domains for all provider-types. Validation of tools is underway at Army Burn Center with R2 teams training for deployment.

Timeline and Cost

Activities	CY	15	16	17	18	19
Role 2 data analysis: who, what, why, when, where, how						
Identify metrics and develop performance assessment dashboard						
Develop evidence-based competencies for R2 team members						
Create program for achieving/sustaining competencies for Tri-Services						
Outcomes of Performance Assessment, Dashboard, training standards						
Estimated Budget ($3.5M)		**$1.2M**	**$880**	**$640**	**$472**	**$286**

Updated: 25 Oct 2018

Goals/Milestones
CY15 Goal
☑ Initiate R2 analysis and conduct comprehensive review of training literature, individual experiences, and Tri-Service training resources.
CY16 Goals
Develop R2 Performance Assessment Dashboard:
☑ Assessed availability of Dashboards for use across the DoD
CY17 Goal
Expand R2 database to all deployed units of OEF/OIF
☑ Collaborating with STRAC to assist with expanding the database to deployed units
CY18 Goal
☑ Implement Tri-Service training and sustainment standard.
CY19 Goal
☐ Evaluate long term outcomes of patients treated at R2 facilities post.
Comments/Challenges/Issues/Concerns: PI attended conference and continued collaboration with the Israeli Defence Forces Sept 2018
Budget Expenditure to Date
Projected Expenditure: $2,782,031
Actual Expenditure: $2,478,303.36

Clinical Transition Framework: *Efficient Solutions for Transitional Support Systems*

Susan Boyer, DNP, MEd, RN

What do ATMs, Velcro, and microwaves have in common conceptually? Origins from NASA and the space race—no, that doesn't include ATMs. They give you something—oops, Velcro is a misfit for that solution. So what do you think they have in common conceptually? Answer: They are a faster, easier way of doing things that did not exist when I was a child!

In the same manner, the Clinical Transition Framework (CTF) offers a faster, easier way of onboarding nursing staff with integration of a group of common professional development principles. The CTF evolved from over 15 years of implementation projects and research related to new graduate, new to specialty, and new hire transitional support. The CTF model provides a competency-based system that addresses the full scope of experience backgrounds, from new graduate to traveler. The evidence-based model offers a single framework for all hires that integrates sampling, concept-base, professional practice, accountability, coaching plans, and the 3 high-end apprenticeships recommended by Benner.[1]

This portion of the CTF overview examines competency assessment that uses precepts of sampling, concept-base, and professional practice. Application of these core concepts led the organization to substantiate competency validation with further literature evidence and clearly defined performance statements. Traditionally, onboarding documentation tools list the tasks and procedures faced within a particular role. It is rare that such lists design and deliver performance criteria in the manner in which we provide care. The format of the tool can make documentation challenging as the preceptor searches for the right line for charting the action or observation. Specialists in professional development often create tools that are all-inclusive and comprehensive, but may miss the critical thinking and clinical judgment aspects that are crucial to professional practice. These challenges emphasize the need for using sampling in a manner that makes the tool easier to complete instead of more complex; comprehensive, but achievable; and with performance criteria that are clear, concise, and concrete.

SAMPLING FOR COMPETENCY VALIDATION

The CTF competency tool engages the model of sampling for collecting evidence of capability. Sampling theory calls for taking a sample of performance skills, validate that the individual performs those skills in a competent manner, and extrapolate that they are competent overall. Sampling is an approach adopted within many academic settings as they prepare nurses for the challenges of clinical practice. The competency-based approach uses a variety of assessment techniques and addresses learner development with consideration for varied learning styles.[2] Competency-based education assessment often includes observation of practice or simulated case management, with each observation offering a sample of full clinical practice. In both academic and practice settings, each post-test established as a course component uses sampling to endorse the knowledge base of the learner.[3] One of the challenges within sampling is making the distinction between competency with a specific set of skills or tasks, and true competence, which requires being able to carry out the full responsibilities of the job. Educators frequently develop "skills labs" for the purpose of establishing task capability. Regrettably even with proficient skills lab performance, questions may remain pertaining to the professional's ability to integrate those tasks within care that adapts to the changing needs and priorities of a patient.

All research projects utilize a sample population for testing the hypothesis that is being studied.[4,5] Sampling is used routinely by the National Council of States Boards of Nursing (NCSBN) as they analyze evidence behind the role of simulation experience, National Council Licensure Examination (NCLEX) test construction and scoring requirements for passing grades.[6,7] In fact, each time nurse candidates complete their NCLEX exams on the computer with less than the total number of questions, a sample of a sample is being used to validate, or not, their licensure.[8]

Another frequent user of sampling is The Joint Commission. The accreditation organization evaluates health care agencies with the purpose of inspiring the provision of safe and effective care of the highest quality. To achieve this, The Joint Commission engages in agency assessment through onsite reviews wherein randomly selected patients, charts, employees, and/or their records are evaluated for compliance.[9] These randomly selected components are the sample that establish whether or not the surveyors document any requirements for improvement or confer accreditation.[10] Both The Joint Commission and the CTF validation serve the purpose of ensuring safe, effective, evidence-based patient care provided with quality. Both systems strive to verify nursing staff competence, while engaging sampling methodology to document the pertinent evidence.

APPLICATION OF SAMPLING WITHIN THE CLINICAL TRANSITION FRAMEWORK

The CTF competency tool identifies the sample with bold print. The directions for form completion state, "All items identified in bold are required elements to be validated within orientation." The competency policy template emphasizes the process with the statements: "Selected competencies are assessed at hire and during the orientation period for the job. Completion of orientation requires documenting all indicated competencies with a score of two (2) or better."

The use of sampling principles allows the tool to identify both initial and ongoing expectations for practice in that setting.[11] The orientation timeframe is insufficient for gaining evidence of proficient practice, yet it is a part of professional role expectations. The required elements within orientation include the high-risk, high-frequency elements of practice. The low-frequency and proficient/expert practice aspects are included on the form without a mandate for completion during orientation. If ongoing expectations are not delineated in the orientation tool, where and when are they communicated to the new hire?

More than the minimum required elements of competency validation are collected for most new hires. This is especially true with those new to the setting who need to learn the nursing science unique to that specialty. Within the CTF documentation, the requirement for completion of orientation is the same for all hires, from new graduate to traveler. The bolded items emphasize the high-risk, high-frequency aspects of care that exemplify nursing practice within that setting. Each agency determines their core sample and any additional elements identified within the agency as requiring attention. Annual competencies will address the high-risk, low-frequency elements of care along with new procedures, medications, or treatments, and elements identified by performance issues or quality improvement indicators.

As the preceptor observes the clinical performance of the new hire, 2 critical elements are revealed that establish the basis for safe patient care. The first element is acknowledgment of the limits of their own knowledge and skills. This factor links with the second, the expectation that they will access appropriate resources or assistance to ensure safe patient care. These are core safety criteria for professional practice in the field of health care.[12] The care provider that is unable to recognize, or unwilling to acknowledge, the limits of their ability is the one that may pose a threat to safe care. With the evolving nature of medicine, there will always be new, updated, and unique aspects of care that may challenge the nurse. Nurse learning is never complete, thus seeking assistance is a core competency of safe, effective practice.

The CTF integrates these 2 crucial elements within the scoring key and teaches preceptors about these essential principles of practice. With validation of each observed performance criteria, the preceptor confirms that the individual recognizes the limits of their ability and seeks assistance appropriately.

PROFESSIONAL PRACTICE CRITERIA AND CONCEPT-BASED APPROACH

Within the CTF, principles of concept-based competency evaluation are applied synergistically with a focus on professional practice criteria.[13] The CTF competency tool shifts from the traditional focus on tasks and procedures with its concept-based approach. Using this method within competency assessment brings 2 significant benefits to the preceptor/new hire team. First, it supports critical thinking development through revealing how aspects of our practice or prior learning carry over into new situations. A concept-based approach assists in critical thinking development as the preceptor asks the questions, "What's the same, what is different, how might we apply this concept to this situation?" Second, a concept-based tool emphasizes professional practice over the completion of tasks and procedures.[14] In addition, the concept-based approach incorporates multiple tasks within an overall goal for the patient. One aspect of professional practice is the ability to adapt care to the patient's changing needs and priorities as we integrate specific tasks and procedures. Another feature of professionalism is the acceptance of personal responsibility and accountability, while applying legal and ethical frameworks affecting clinical practice.[12]

The initial new graduate internship created the foundation for the competency tools used in the CTF. In 1999, the Competence Outcomes Performance Assessment (COPA) model was the only published competency model found for nurse development within the original literature search.[15] Finding this framework started the journey toward the current view of professional practice, but the initial revelation resulted in aspects of critical thinking being incorporated within orientation tools.[14,16] The 8 core practice competencies of the COPA model include foci on critical thinking and human caring. The subskill examples provide a starting point for writing clear, concise, and concrete performance criteria for each of the competency areas.[14]

Dr. Lenburg assisted with developing the initial tools and fostered writing the performance criteria at the highest possible level. This started the use of the top of Bloom's taxonomy as revised to *A Taxonomy for Teaching, Learning, and Assessment*.[13,17] The revised taxonomy specifically targets experiential learning, which is core to clinical competency development and validation. The top levels of the taxonomy target actions related to analyzing, evaluating, and creating—core aspects of professional practice.

The concept-based approach of development and performance validation works synergistically with the focus on reflective, professional practice.[13] Instead of targeting details of task, equipment use, and completing procedures, the CTF focuses on how these elements are used within the management of the patient. For example, professional nursing practice engages assessment, evaluation, and synthesis to adapt a plan of care to address dysrhythmia. This, rather than the technical aspects of taking an electrocardiogram (ECG), is essential professional practice. Taking an ECG is a component of care and one learning strategy within the overall patient-centered goal.

Within the CTF model, patient-centered care is the target of each goal statement for nurse competence validation. Professional practice goal statements focus on the patient instead of emphasizing task, procedure, role, or body system. When you consider your agency, is the purpose of the emergency department (ED) nurse assisting the physician, or supporting the patient undergoing a minor procedure? Keep in mind that the subject of our goal statement is the recipient of our time and attention.

Shifting our approach to concept based helps preceptors by presenting aspects of care in the manner in which we provide care. Performance criteria listed for that goal follow the pattern of care delivery, which eases documentation of observations. The ED nurse would be providing care for the patient presenting with chest pain. Within that care delivery are performance aspects of interpreting an ECG, determining appropriate response, administering meds, evaluating response to treatment/medications, considering differential diagnosis, managing intravenous therapy, and so on. Each of these performance criteria represents a high level of professional practice that integrates both critical thinking and clinical judgment.

An additional benefit of the concept-based approach is the role that it plays in developing critical thinking and clinical judgement capability. "How is this the same, how is it different, and so, what now?" are recurring questions used by preceptors to develop reflective learning and practice.[18] These questions are critical elements for developing critical thinking capability and supporting transition toward the effective clinical judgement that is inherent to professional practice.[19]

An additional benefit of CTF competency validation is use of the same tool for every new hire, from new graduate to traveler. Instead of creating a special tool for new graduate internships or residency programs, the standardized CTF tool communicates essential elements of professional practice from day 1 of employment. The tool provides consistent communication of both initial and ongoing practice expectations within the facility.

IMPLEMENTATION RESULTS

Implementation of the framework fosters a variety of positive outcomes. When the framework was used in Nebraska as part of a new graduate transition program, significant savings and reduction of errors or "near miss" events was reported by participating preceptors and managers.[20] The project engaged implementation in both rural and urban settings, with specific preceptor education and competency tools provided by Vermont Nurses in Partnership (VNIP) faculty. Investigators from the Nebraska project emphasized the value of preparing preceptors as a teacher, coach, evaluator, and advocate for the new hire.

A level one trauma center in Texas found that the objective metrics within the competency tools enabled ongoing assessment and made training adaptable, individualized, and cost-effective.[21] The goal of their original performance improvement project was to identify and implement a program that would reduce the incidence of nursing turnover within their burn center. Analysis of project outcomes showed a decrease in the nurse turnover rate from 33.6% (prior to the program) to 16.5% in the year following completion of the program, a 50% decrease ($p < 0.1$).[21(p.4)] This agency estimated the savings associated with retaining just 1 specialty nurse at around $85,000, which could easily offset program administrative costs.

The agency also stressed the value of reducing the paperwork burden placed on preceptors. The competency validation tools used prior to the project required 683 preceptor signatures, whereas the CTF tools reduced that requirement to 164 signature lines for the same unit orientation. A reduction in signatures eases the workload for those collecting evidence of competence.

These 2 projects give examples of outcomes from CTF model implementation in 2 distinct studies. The VNIP website offers a listing of further evidence within the white paper *Clinical Transition Framework Evidence Base*.[22]

CONCLUSION

The call for a radical transformation in nursing education emphasizes the need for reflective learning and apprenticeships that address knowledge integration, ethical comportment, and professional formation.[1] The CTF integrates these crucial concepts within a set of tools and precepts that are adaptable to each setting, agency, and population. The CTF performance criteria have shifted from the traditional task-oriented tool to a concept-based approach, which engages the precepts of sampling to gather evidence of capability. The focus on professional practice raises the bar of role expectations beyond the technical skills to embrace critical reflection and judgment skills needed for 21st century health care. Sampling technique is at the core of making the entire process achievable within a clear, concrete, and concise framework. The CTF brings the model components together into a methodology that is applicable for new hires entering the agency at varied levels of practice experience. This model represents a faster, easier way of doing things that contrasts with the traditional, task- and detail-oriented approach to competency validation. NL

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The Afghan Theater: A Review of Military Medical Doctrine From 2008 to 2014

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ABSTRACT This article forms part of a series that will explore the effect that Role 2 (R2) medical treatment facilities (MTFs) had on casualty care during the military campaign in Afghanistan and how we should interpret this to inform the capabilities in, and training for future R2 MTFs. Key aspects of doctrine which influence the effectiveness of R2 MTFs include timelines to care, patient movement capabilities, and MTF capabilities. The focus of this analysis was to review allied doctrine from the United States, United Kingdom, and the North Atlantic Treaty Organization to identify similarities and differences regarding employment of R2 related medical assets in the Afghan Theater, specifically for trauma care. Several discrepancies in medical doctrine persist among allied forces. Timelines to definitive care vary among nations. Allied nations should have clear taxonomy that clearly defines MTF capabilities within the combat casualty care system. The R2 surgical capability discrepancy between United States and North Atlantic Treaty Organization doctrine should be reconciled. Medical evacuation capabilities on the battlefield would be improved with a taxonomy that reflected the level of capability. Such changes may improve interoperability in a dynamic military landscape.

INTRODUCTION

This article forms part of a series that will explore the effect that Role 2 (R2) Medical Treatment Facilities (MTF) had on casualty care during the military campaign in Afghanistan and how we should interpret this to inform the capabilities in and training for future R2 MTFs. Roles of care refer to the increasing medical capabilities available for the combat injured. Generally, at the point of injury, combat life savers (soldiers trained to perform basic first aid) and trained combat medics apply Tactical Combat Casualty Care interventions to stabilize casualties and prepare for evacuation.[1] Role 1 (R1) represents unit-level care at a field medical station, where a Licensed Independent Provider can provide advanced airway management and possibly initiate fresh whole blood transfusion in preparation for evacuation to surgical support. R2 provides more robust medical resources than R1, and is the first level of care where damage control surgery (DCS) and advanced resuscitation may be provided, but offers limited patient holding ability. R2 is the first MTF in the chain of evacuation, also referred to as Deployed Hospital Care. Role 3 (R3) is a deployed field hospital offering expanded surgical and imaging capabilities; patient holding duration is technically unlimited. Role 4 (R4) is a fixed facility that is in the home country of the deployed force or that of ally and offers all medical and surgical specialties from acute care to long-term rehabilitation.

The focus of this analysis is to review doctrine to identify similarities and differences regarding employment of R2 related medical assets in the Afghan Theater specifically for trauma care. The scope is limited to North Atlantic Treaty Organization (NATO) and United States (US)/United Kingdom (UK) joint and single Service doctrine, as the overwhelming majority of MTFs and evacuation assets in Afghanistan were from these two nations. An R2 Registry was implemented by the US Joint Trauma System in 2008 so doctrine from 2008 to 2014 was reviewed.

What Is Military Doctrine and How Is It Organized?

Military doctrine is the expression of how the military operates, linking theory, history, experimentation, and practice. Its objective is to describe how to think, not what to think. Yet, despite its centrality to military thinking, doctrine has been described[2] as ill-defined, confusing, and poorly understood. NATO's definition of doctrine,[3] used unaltered

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by many member nations including the US Department of Defense, is:

> "Fundamental principles by which military forces guide their actions in support of objectives. It is authoritative, but requires judgment in application."
>
> It goes on to say that
>
> "policy, as agreed by the highest National Authorities, normally leads and directs doctrine, and that applied doctrine is necessary for effective coalition building."

The UK follows this line stating[4] that "Except where there is a specific need for national doctrine, the UK will adopt and employ NATO doctrine."

Military doctrine has been variously categorized but contemporary taxonomies tend not to align doctrine to a particular level of conflict or environment. The UK[5] advocates four broad levels: philosophy, principles, practices, and procedures. Describing the relationships between these levels as:[6]

> "**Philosophy** is conceptual, enduring, pervasive and largely descriptive. It provides understanding. **Principles**, which are more specific, build upon the philosophical foundations to summarize that understanding. Both are likely to provide clearer context than faster-moving doctrine can, provided they are malleable. **Practices** describe the ways in which activity is conducted. **Procedures** link practices together. Both are intended to be prescriptive. Lower-level doctrine could change relatively rapidly and pragmatically, often from a bottom-up direction. However, practices and procedures should always be consistent with the higher-level philosophy and principles, which change only as a result of measured consideration, which is usually a top-down process."

Using this template, Table I shows how the doctrine examined within this article fits into the organizational hierarchy.

Key aspects of operational factors which influence the effectiveness of R2 MTFs:

– Timelines to care
– Patient movement capabilities
– MTF capabilities

TIMELINES

Once injured, the principal factor that determines mortality, morbidity, and residual disability is time to required level of medical care. This is true of all medical emergencies, but is of overriding significance when dealing with surgical emergencies—particularly surgical control of hemorrhage in the combat setting. Hence, evacuation time is the major clinical driver dictating the type and location of medical assets in operations and conflicts, and timeliness in providing appropriate intervention to the wounded or ill is crucial. The provision of high-quality early intervention has been shown to improve outcomes, while any delay either before care is initiated or between subsequent levels of care, will be deleterious to patient outcomes.[7]

Allied Doctrine, Allied Joint Publication (AJP) 4-10 (A) was the extant NATO doctrine for the whole of the

TABLE I. Levels of Doctrine

Level	Doctrine Publication: Allied	US	UK
Philosophy		JP-1	BDD
Principles	AJP-01(D) AJP 4-10 (A)	US Army capstone pub JP 4-02 Army FM 4-02 (ATP 4-02)	JDP 01 Campaigning ADP-Ops JWP 4-03/JDP 4-03 AMS Core Doctrine
Practices (Includes Joint and Allied Environmental, Functional and Thematic Doctrine)	AMedP-1 AMedP-2 AMedP-13(A)	Army FM 4-02.25 ATP 4-02.3 (Army) ATP 4-02.5 ATP 4-02.55 NWP 4-02 (Navy) NTTP 4-02.2 (Navy) MCRP 4-11.1G (USMC) ANNEX 4-02 (USAF)	AFM
Procedures		JTS CPGs	CGOs MIMMS BATLS

ADP, Army Doctrine Publication; AFM, Army Field Manual; AJP, Allied Joint Publication; AMedP, Allied Medical Publication; AMS, Army Medical Services; ANNEX, United States Air Force Doctrine; ATP, Army Technical Publications; BATLS, Battlefield Advanced Trauma Life Support; BDD, British Defence Doctrine; CGO, Clinical Guidelines for Operations; CPG, Clinical Practice Guidelines; FM, Field Manual; JDP, Joint Doctrine Publication; JP, Joint Publication; JTS, Joint Trauma System; JWP, Joint Warfare Publication; MCRP, Marine Corps Reference Publication; MIMMS, Major Incident Medical Management Support; NWP, Navy Warfare Publication; NTTP, Navy Tactics, Techniques, and Procedures.

period. Its principal medical planning timeline was the 1-2-4 hour principle:

> "Primary (definitive) Surgery [8] for critically injured patients within one hour of wounding. If this is not achievable then Damage Control Surgery (DCS)[8] should be available within two hours followed by primary surgery within four hours."[8]

Subordinate NATO publications have not provided further guidance. Allied joint medical planning doctrine (AJMedP-1) recommends the planning of Medical support based on the consideration of "all factors,"[9] but does not explicitly mention time and its effect on a casualty. Allied joint doctrine for medical evacuation (AJMedP-2) provides categories for patient evacuation[10] (Priority 1 requiring immediate transfer, Priority 2 within 24 hours, and Priority 3 within 72 hours) but only referred to clinical timelines when discussing forward medical evacuation (MEDEVAC)[10] and did not specify any timelines by which casualties should reach a level of care. Standardization agreement (STANAG) 2087[11] contradicts AJMedP-2, prescribing a 2-hour evacuation time limit for urgent cases and 4 hours for priority cases.

UK Joint Doctrine initially (up to March 2011) was based on Joint Warfare Publication 4-03[12] which prescribed the 1:2:4 hour principle, albeit subtly different to the NATO description:

> "rapid access to first aid and BATLS (battlefield advanced trauma life support)/BARTS (battlefield advanced resuscitation techniques and skills) resuscitation within one hour of wounding; access to surgical resuscitation (e.g., DCS) for those who require it within two hours of wounding; and primary surgery within four hours of wounding."

It also recognized that when required by the unique operational environment the principle could be adapted accordingly. This was superseded by Joint Doctrine Publication (JDP) 4-03[13] which advocated a new clinical paradigm; 10(min)-1-2[14] (according to the Allied Command Operations Directive on Medical Support to Operations as cited by JDP)[13] where:

> "bleeding and airway control for the most severe casualties should be achieved as soon as possible—ideally within 10 minutes of wounding. MEDEVAC assets should reach the seriously wounding with skilled medical aid within one hour of wounding at the latest. Casualties that require surgery or further resuscitation should, where possible, be in an MTF equipped for this within two hours of wounding."

UK Army Doctrine[15] advocated the 10-1-2 timeline to guide decision making regarding the configuration and location of the MEDEVAC and MTFs, while recognizing the enduring utility of the 1-2-4 hour principle that focuses on the timeliness for casualty movement between DCS and Primary surgery. Both US Joint (JP4-10 2006)[16] and US Army (FM 4-02.2[17] May 2007) doctrine described patient precedence for evacuation as:

> "within two hours for Urgent cases, within four hours for Priority cases and within 24 hours for Routine cases."

The US position changed (as cited in Rasmussen, 2016), however, following Congressional Interest in late 2008 and 2009 and resulted in changes for prehospital evacuation of:

> "One hour for urgent and urgent surgical missions to appropriate medical care."[7,18]

This was incorporated into the Army FM 4-02.2[19] in July 2009 and remained extant in the October 2011 version (ATTP 4-02),[20] the August 2013 version of FM 4-02,[21] and the August 2014 version of ATP 4-02.[22] In these later publications, the guidance was that Urgent cases should be evacuated as soon as possible and within 1 hour, yet the "Urgent-Surgical" category does not specify time to surgical intervention.[22] Priority cases remained as within 4 hours and Routine as within 24 hours. These changes were not made to the Joint Doctrine until the current version was published in 2012.[23] Subordinate doctrine publications such as FM 4-02.25 (Employment of Forward Surgical Teams [March 2003]) offered no further guidance regarding timelines to care. US Army doctrine is generally stated as implementing or being in consonance with the North NATO STANAG. The US Joint Medical Doctrine referenced ABCA (America, Britain, Canada, Australia/New Zealand) publications but no Allied documents.[24]

In summary, there were differing doctrinal timelines in use over the January 2008 to October 2014 time period in the Afghan theater of operations as described in Table II.

TABLE II. Evacuation Time Planning Policy

Organization	Evacuation Time Planning Policy	Time Period
NATO	1-2-4 hours	(January 8–October 14)
UK	1-2-4 hours	(January 8–March 11)
UK	10 minutes-1 hour-2 hours	(March 11–October 14)
US	2 hours for Urgent Cases and 4 hours for Priority Cases	(January 8–July 9)
US	1 hour for Urgent cases and 4 hours for Priority Cases	(July 9–October 14)

NATO, North Atlantic Treaty Organization; UK, United Kingdom; US, United States.

In terms of what level of care should be reached within these timelines, NATO Doctrine explicitly states that it should be to definitive surgery, ideally within 1 hour but if not DCS within 2 hours. The UK advocates skilled medical aid within 1 hour and surgery within 2 hours, whereas the US started the campaign with a 2-hour guideline for evacuation of urgent cases without explicitly stating to what level of care. This was changed to 1 hour in July 2009 with the addition of the statement to "appropriate medical care."[18]

PATIENT MOVEMENT CAPABILITIES

Evacuation of casualties is a crucial part of the deployed Health Service Support system and requires specific medical personnel and assets. Time to care creates interdependency between evacuation, treatment, and the theater-holding policy,[25] with each directly impacting the other if the standard of patient care is to be maintained. Thus patient movement is not simply a transportation task but is part of the continuum of care and a medical responsibility.

NATO doctrine[8,10] advocates that a medical evacuation system should have the following capabilities:

(a) The ability to evacuate casualties to a MTF 24/7, in all weather, over all terrain and in any operational circumstances
(b) The provision of the necessary clinical care throughout the journey
(c) The ability to regulate the flow and types of patients.

Unlike the Roles used to describe MTFs, NATO doctrine[8,10] describes MEDEVAC, be it ground or air (Aeromedical Evacuation [AE]), in terms of where along the chain of evacuation it operates giving three main categories:

(a) **Forward MEDEVAC/AE**—Point of wounding to the initial MTF. This is required by operational circumstances to meet clinical timelines.
(b) **Tactical MEDEVAC/AE**—between MTFs within the Joint Operational Area.
(c) **Strategic MEDEVAC/AE**—from the Joint Operational Area, to the home nation or other country/safe area.

Although NATO doctrine states the priorities and dependency of patients requiring evacuation[26] (see above), it provides no guidance as to the levels of medical capability required; the focus is on the transport assets and the process to control them. Where specific skills are mentioned, guidance remains broad. AJP 4-10(A)[8] merely states the range of potential capabilities when discussing prehospital ground evacuation transportation:

> "There is variation in terms of capabilities and patient capacity. Most will be equipped for basic life support only, but at the top of the scale are advanced support units, staffed with emergency care medical specialists and/or trained specialist paramedic personnel who can provide extended resuscitative care, administer drugs, and begin administration of intravenous fluids in addition to providing basic first aid."

It takes a similar line with Tactical AE of pre- and post-operative patients, recognizing only the requirement for specialist clinical staff and equipment. AJMedP-2[27] in its discussion on Incident Response Teams suggest that medical capability could range from paramedical staff to primary health care professionals with advanced resuscitation training, to specialist secondary care teams.

US Joint Doctrine[24] focuses on transport assets, priorities and process although in the Appendices of both publications reference is made to the Critical Care Air Transport Team requiring specialty or critical care capability. US Army doctrine[28,29] focuses on the priorities for evacuation and not medical capabilities. UK Joint Doctrine does not contain a specific section of medical transfer/evacuation[13] and like the Allied and US doctrine it focuses on priorities and responsibilities rather than capabilities. Guidance in the later UK Joint doctrine[30] refers only to appropriately trained medical staff except when describing the Medical Emergency Response Team (MERT) capability:

> "It is based on para-medics or emergency medicine nurses but may be augmented by medical officers experienced in skills such as advanced airway management, rapid sequence induction and the maintenance of anesthesia."

UK Army doctrine also acknowledges that the MERT requires crew augmentation for prehospital emergency care interventions but does not specify further.

MEDICAL TREATMENT FACILITIES

NATO MTF Role Terminology should provide a common language that enables planners to determine the theater laydown and facilitates interoperability. In practice, however, national caveats and mission specific nuances have blurred the boundaries over the last 10 to 15 years.

AJP 4-10(A) categorizes MTFs into four tiers or Roles on a progressive basis (Table III).[31–33] Each Role of care is defined by a minimum clinical capability and not by its capacity or maneuverability. In principle, each MTF contains the minimum capabilities of the Roles below it, while an MTF cannot be reduced below the minimum capabilities of its given numeric descriptor. UK Joint Doctrine initially[30] used NATO terminology, but in the later publication,[30] more caveats are introduced. UK Army Doctrine[15] uses NATO terminology without exemptions but does note that boundaries can be blurred. The earlier versions of US Joint Doctrine[34] did not use the term Roles, instead describing healthcare capabilities from prevention through to definitive care, and only referred to the NATO definitions in a later chapter.[34] This changed in July 2012[24] when the NATO definitions were included in the main text. US Army Doctrine[28] initially uses the term "Levels" rather than Roles

TABLE III. Levels (Roles) of Trauma Injury Care

Levels (Roles) of Trauma and Injury Care	
Current Levels (Roles) of Care	Function
Role I Battlefield Care to Battalion Aid Station	Initial level of care/immediate lifesaving measures. Emphasis on stabilizing casualty for evacuation to next level of care. Similar to civilian first responders. Also includes: Battlefield Care (Self-Aid/Buddy Aid, Combat Lifesaver and Combat Medic). Battalion Aid Station (far forward aid station with at least one physician available.
Role II Forward Surgical Team	Small, highly mobile, austere surgical team. Provides life-and-limb saving surgical care and typically the first level of surgery available. Limited capabilities, some laboratory, X-ray, mental health and dental services may be available.
Role III Combat Surgical Hospital Air Force Theater Hospital	High volume trauma center. Highest level of treatment within the area of military operations. Provides full range of surgical, medical, laboratory, and radiology capability. Care also includes dental, physical therapy, mental health, obstetrics/gynecology, and primary care services.
Role IV OCONUS Example: Landstuhl Regional Medical Center	Definitive medical and surgical care. Outside of area of military operations or combat, but not within CONUS. Stabilization point before evacuation to CONUS.
Role IV CONUS Walter Reed National Military Medical Center, Brook Army Medical Center	Definitive medical and surgical care OCONUS.

Adapted from Horne et al, 2014; Silva 2014; Cubana et al, 2013.[32–35]

but, in broad terms, they describe the same medial capability. This changed in the later doctrine[21,29] with Roles replacing Levels in line with the NATO terminology. Its R2 description remained consistent throughout, stating that they have the capability to provide packed red blood cells (liquid), limited x-ray, and clinical laboratory support but not surgery. A note emphasizing this appears in the October 2011 publication highlighting the differences with the Allied publications (See below). There are minimal differences in the definitions of R1 and R3 MTFs used in Allied,[8,15] UK,[13,15,30] and US[28,29,34] doctrine; Joint or single Service. The significant differences are in the descriptions of what constitutes a R2 capability.

R2 MTF

NATO defines R2 as:[35,36]

> "providing an intermediate capability for the reception and triage of casualties, as well as being able to perform resuscitation and treatment of shock to a higher level than Role 1. It will routinely include DCS and may include a limited holding facility for the short term holding of casualties until they can be returned to duty or evacuated. It may be enhanced to provide basic secondary care including primary surgery, intensive treatment unit and nursed beds."

NATO doctrine[36] also introduced a delineation in R2 capabilities; those able to support R2 light maneuver (R2[LM]) and the more clinically capable variant R2 enhanced (R2[E]). The R2(LM) MTFs are described[36] as able to conduct triage and advanced resuscitation procedures up to DCS. They will usually evacuate postsurgical cases to R3 (or R2[E]). In addition to R1 capabilities, R2(LM) will include

(a) Specialist medical officer led resuscitation with required support elements
(b) Routine DCS with postoperative care
(c) Field Laboratory capability
(d) Basic imaging capability
(e) Reception, regulation and evacuation of patients
(f) Limited holding capacity.

The same doctrine[38] describes R2(E) MTFs as:

> "small field hospital providing basic secondary health care, built around primary surgery, ICU and nursed beds. It is able to stabilize post-surgical cases for evacuation to Role 4 without needing to put them through a Role 3 MTF first."

In addition to R2(LM), R2(E) will include

(a) Primary (definitive) surgery
(b) Surgical and medical intensive care capability
(c) Nursed beds
(d) Enhanced field laboratory including blood provision.

Initially, UK Joint Doctrine[13] did not recognize the NATO subdivision but merely stated that R2 MTFs "may, in certain circumstances, include DCS when it will be known as R2+." This is rectified in a later publication[30] describing R2(LM) as providing "advanced resuscitation up to DCS" and R2(E) MTFs able to provide Primary surgery and evacuate directly to R4. The later doctrine also includes blood availability but only at R2(E) MTFs. UK Army doctrine[15] from March 2012 is coherent with the joint doctrine in its definitions of both R2(LM) and R2(E).

US Joint Doctrine initially[34] acknowledged Allied terms only adopting them in the July 2012[24] publication. US Army Doctrine, however, retained its definition and added a note to this effect in October 2011:[38]

> "Note. The R2 definition used by NATO forces (Allied Joint Publication-4.10[A]) includes [the following] terms and descriptions not used by US Army. US Army doctrine subscribe to the basic definition of a R2 MTF providing greater resuscitative capability than is available at Role 1. It does not subscribe to the interpretation that a surgical capability is mandatory at this Role per the NATO doctrine. The NATO descriptions are
>
> – A medical company with a collocated forward surgical team may be referred to as a light maneuver R2 facility.
> – An enhanced R2 MTF may be used in stability operations scenarios and consists of the medical company, forward surgical team, and other specialty augmentation as deemed appropriate by the situation."

It should be noted that one of the key capabilities of Forward Resuscitative Surgical Teams is its ability to function effectively when independent of a R2 MTF. US Army Forward Surgical Teams, US Air Force Mobile Field Surgical Teams and US Navy Forward Resuscitative Surgical Squadrons are all able to integrate with traditional R2 MTFs but are also designed to rely on evacuation assets to rapidly clear stabilized patients, sometimes immediately after surgical procedures are completed. One damage control surgical capability, the US Air Force Tactical Critical Care Evacuation Team–Enhanced, took the next logical step of integrating forward resuscitative surgical care directly into the evacuation platform—allowing evacuation and surgical stabilization to occur in concert. During the Afghanistan conflict, tactical evacuation capabilities routinely served this role and compensated for the increased patient acuity by providing advanced clinical providers (Emergency Medical Technician-Paramedics, Critical Care Nurses, and Emergency Medicine Physicians) when needed.

DISCUSSION

How have operations in Afghanistan impacted on medical doctrine? For the most part this article has focused on the higher levels of doctrine which we noted change only as a result of measured consideration, usually a top-down process. The one significant example of change at this level (US time to care, the "Golden Hour Initiative")[18] only occurred after direction from the Executive authority (highest National Authorities), but even this failed to make it into the joint doctrine until 2012. Otherwise it can be argued that higher level doctrine did not change during the period to reflectreality on the ground; a reality that saw the medical approach to trauma develop significantly. The changes that did occur were captured in the lower tactical levels as standard operating procedures and tactics, techniques, and procedures which were able to react to these changes through bottom up demand. In his thesis "A Revolutionary Approach to Improving Combat Casualty Care," Hodgetts makes the case that over this period we have seen a revolution in military medical affairs. A summary of the doctrinal changes Hodgetts states in his thesis is at Table IV.

These changes are prescriptive and are more about "what" to do rather than "how" to think. That said, the effect these changes have had on the outcomes for trauma casualties on the Battlefield cannot be disputed. The lessons from this campaign will influence higher level doctrine but before changes can be incorporated it is necessary to be clear about what is enduring and applicable universally rather than adaptations specific to that theater of operations or campaign. The question now is how should our experiences in Afghanistan shape our higher level doctrine for the future?

Some change has already occurred; the latest edition of the Allied Joint Doctrine for Medical Support (AJP 4-10[B]) now includes the 10-1-2 guidelines and the level of care to be reached within each time frame[39] as well as the concept of Damage Control Resuscitation (DCR). Yet, despite a stated willingness to adopt Allied doctrine there are still many national caveats regarding what constitutes a R2 MTF and the time lines to a particular Level of Care. R2 MTFs can, under current guidance, be anything from a higher capability than a R1 MTF to a small hospital. This span is probably too great and hinders both planners and interoperability among allies when different capabilities are mandated (e.g., lack of required surgical capability for US R2 elements). As the R2(E) is accepted as being a "deployed hospital" then perhaps it would be simpler if "R3" identified any "deployed hospital" with a suffix denoting its level of capability (level I, II, III). The Afghan campaign highlighted the nonlinear nature of medical support where patients can move from point of injury to surgical care without any

TABLE IV. Significant Doctrinal Changes During Period of Operation Enduring Freedom (c. 2002 to 2014)

Significant Doctrinal Changes
ABC to <C>ABC
Tourniquet Use
4 Stages of Combat Resuscitation
Rapid Primary Survey
MIST Report
Clinical Guidelines for Operations
Damage Control Resuscitation
Hemostatic Resuscitation
Immediate Surgical Intervention Upon MTF Arrival

ABC, airway, breathing, circulation; "<C>," catastrophic hemorrhage; MIST, mechanism, injuries, symptoms, treatment; MTF, medical treatment facility.

intermediate steps. Thus there is no need to categorize deployed hospitals as a R2 simply to show that it is further forward. Ultimately, this would then allow R2 MTFs to focus on the intermediary nonsurgical capability on the way to the deployed hospital, and subsequently, allow the use of the term for MTFs without surgery. This is something the US has kept within its doctrine as it envisages such facilities being the norm in any larger scale near-peer conflict.

The UK Joint doctrine has now been archived and replaced by AJP 4-10(B), but still retains a caveat stating the UK uses the 10-1-2+2 timeline.[39] US doctrine remains is as it was in October 2014 and they too have recorded reservations in AJP 4-10(B) specifically regarding the timelines and the level of care available.[39] The primary difference for the US is that R2 does not have to contain surgical capability, therefore timelines are to an appropriate MTF within an hour and not to surgery. This less demanding position is necessary in the higher doctrine as it needs to be relevant to all future campaigns and not just what happened during the most recent operation. Doctrine must also reflect the realities of a large-scale conflict with a near peer opponent.

Conversely, another potential solution would be to disassociate forward surgical capabilities from the entanglements of the Role definitions. The tactical advantage of small surgical teams integrated into a joint trauma system can melt away if encumbered by doctrinal attachment to MTFs designed primarily to support trauma care delivery. These small teams can functionally bring lifesaving capabilities to operational areas that would otherwise be supported at the R1 (R1) level, fully integrate with R2 MTFs and augment R3 advance surgical capabilities to increase surgical throughput. If forward surgical care doctrine is to be most effective in future operational environment against near peer adversaries, it must recognize the tactical advantage of small size and unencumbered mobility of forward surgical capabilities operating independent of MTFs and reliant on tactical evacuation for relief of limited holding bed capability. This concept is consistent with most existing NATO and other doctrine that focuses on time to appropriate surgical intervention/DCR as opposed to defined Role of care.

One of the significant changes seen in Afghanistan was the increase in the range and the medical capabilities carried on patient movement assets. Typically there were three levels of capability available to the Patient Evacuation Coordination Cell to task described in Table V. There may be an advantage in having levels of MEDEVAC assets in the same way we have levels of MTFs, each with an agreed level of medical capability (probably not far off those above). In the same way MTF capabilities assists planners in configuring the theater laydown, so will agreed MEDEVAC capabilities. It will equally help develop the mutual understanding required if the higher levels of interoperability are to be achieved. This will then drive changes that support the intelligent tasking of the various MEDEVAC capabilities; a requirement for quicker more timely medical information and the availability of a Medical Common Operating Picture.

Limitations in this review include the limited scope of the analysis from 2008 to 2014; future evaluation will focus on allied doctrine from 2014 and beyond. The primary goal of this review was trauma-related combat casualty care, yet primary care and disease nonbattle injury comprises much of deployed medical care and is the driving force behind much of the current R2 doctrine, particularly for the US Army. These doctrinal differences were not addressed in this article.

A larger and more difficult question may be the definition of an alliance or Joint force. Currently there is no mandate to reach consensus on doctrine, yet failure to do so inherently hinders interoperability. Perhaps the solution is more integrated war-gaming and sharing of resources and greater inter-agency and inter-national compromise to reach consensus.

CONCLUSION

Several discrepancies in medical doctrine persist among allied forces. Timelines to definitive care vary among nations. We as allied nations should have clear taxonomy that clearly defines MTF capabilities within the combat casualty care system. The R2 surgical capability discrepancy between US and NATO doctrine should be reconciled. Medical evacuation capabilities on the battlefield would be improved with a

TABLE V. Casualty Evacuation Platforms

Casualty Evacuation Type	Highest Level of Medical Provider	"Level" of Medical Capability	Offensive Arms
Lift of Opportunity	Combat Life Saver	<1	Y
US Army Air Ambulance ("DUSTOFF")	Flight Paramedic	1	N
US Army Air Ambulance (Augmented)	Critical Care Registered Nurse and Flight Paramedic	2	N
US Air Force Rescue Squadron ("PEDRO")	Para-medic	2	Y
US Air Force Tactical Combat Casualty Evacuation Team (TCCET)	Emergency Medicine Physician, Nurse Anesthetist, Emergency or Critical Care Nurse	3	N
US Air Force Tactical Critical Care Evacuation Team–Enhanced (TCCET–E)	Surgeon, Emergency Physician, Nurse Anesthetist, Emergency Nurse, Operating Room Technician	3+ (Surgical capability)	N
Medical Emergency Response Team (MERT), United Kingdom)	2 Physicians, Emergency Nurse, 4 Para-medics	3	Y

taxonomy that reflected the level of capability. Such changes may improve interoperability in a dynamic military landscape.

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Clinical Transition Framework

Integrating Coaching Plans, Sampling, and Accountability in Clinical Practice Development

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The clinical transition framework (CTF) is a competency-based practice development system used by nursing professional development practitioners to support nurses' initial orientation or transition to a new specialty. The CTF is applicable for both new graduate and proficient nurses. The current framework and tools evolved from 18 years of performance improvement and research projects engaged in both acute and community care environments in urban and rural settings. This article shares core CTF concepts, a description of coaching plans, and a professional accountability statement as experienced within the framework.

The Vermont Organization of Nurse Leaders developed the initial clinical transition framework (CTF) competency validation tools in response to an identified, statewide need for structured internship or residency programs for nursing students, new graduates, and new to specialty nurses. The initial new graduate program underwent testing through 2 years of multiagency pilot. Subsequent pilot projects applied the concepts and tools for nurses' transition to new specialties. The positive outcomes, including decreased costs, increased retention, and improved nurse satisfaction, encouraged further collaboration between the nonprofit organization Vermont Nurses in Partnership (VNIP) and various agencies on a regional and national basis (Delfino, Williams, Wegener, & Homel, 2014; Hawkins & Exstrom, 2014; Robbins et al., 2017). The expanded work established an evidence base that reflects framework use in rural, urban, critical access, tertiary care, and clinic settings across the continuum of care (VNIP, 2017a).

The comprehensive CTF evolved from a new nurse graduate internship to a comprehensive competency onboarding framework through a rapid cycle quality improvement process (Etchells, Ho, & Shojania, 2016; VNIP, 2016). The CTF is more than an internship or residency, preceptorship or orientation program. VNIP coined the title of *Clinical Transition Framework* because the other terms as listed describe components within the framework but may be limited in their scope, target audiences, and application process. The CTF combines all of these elements to produce a systematic, standardized approach for developing and validating competency in the clinical setting, while protecting patient safety in a conscious, specific manner. To achieve this end, the CTF incorporates concepts from new graduate residency, preceptor development and support, and orientation elements and adds specific concepts related to sampling theory and professional accountability. As a competency-based system, the length, intent, instruction, and outcomes requirements are adapted to the individual and the expertise that he or she brings to the clinical setting.

The resulting competency framework establishes the same standards and documentation to provide evidence of competence for all registered nurse hires, no matter their background or experience (Boyer, Valdes-Delgado, Huss, Barker, & Mann-Salinas, 2017). The CTF engages preceptors as crucial competency validation professionals and is applicable for initial orientation, cross-training, new graduate internships, and/or support for new specialty transition (VNIP, 2016). The framework is an evidence-based model with demonstrated success and consistent implementation across a diverse set of specialties within tertiary, primary, and home care settings (Delfino, Williams, Wegener,

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& Homel, 2014; Hawkins & Exstrom, 2014; Peterson & Donehower, 2015; Robbins, et al., 2017).

Within the CTF, the preceptor development system and three high-end apprenticeships add focus to critical thinking development for those using the CTF for onboarding new or transitioning nurses. Orientation tools within the CTF gather a sample of evidence related to clinical competence and conclude with a statement attesting to the individual's accountability as a professional nurse. The CTF clinical coaching plans guide both the preceptor and new hire while offering a concrete tool for reflective learning. The framework provides an evidence-based, progressive means of onboarding new staff that integrates high-end apprenticeships for developing specialty knowledge base, skilled know-how, and ethical comportment as recommended by Benner, Sutphen, Leonard, and Day (2010). VNIP faculty and nursing professional development (NPD) specialists established the CTF with tools that engage clinical coaching, sampling, accountability, and evidence-based preceptor development and support.

The purpose of this article is twofold: first, to disseminate crucial features of the CTF as developed through broad-based collaborative efforts, and second, to share two specific tools that evolved out of framework utilization—a coaching plan and an accountability statement.

ROLE OF APPRENTICESHIPS IN NURSE DEVELOPMENT

In 2010, Benner et al. called for a radical transformation of nursing education. Three high-end apprenticeships are outlined in the recommendations for change. The apprenticeships target (a) learning nursing science specific to the specialty, (b) developing skilled know-how through deliberate practice, and (c) an apprenticeship in ethical comportment and professional formation. Although the apprenticeships occur synergistically throughout a nurse's development, each may take precedence within a specific period of the novice-to-expert continuum, as shown in Figure 1. The three apprenticeships are integrated within individualized development plans and preceptorships.

Preceptors implement coaching plans within the CTF that provide a written outline of the nursing science unique to the domain of practice and engage the learner in developing skills at a level aligning with the individual nurse's learning needs. For example, consider the clinical performance goal of *Addressing unique needs of the geriatric patient* versus one of *Coordinating individualized care within a multipatient assignment*. The multipatient assignment requires more advanced skills and work coordination than addressing age-specific care with a single patient. The preceptor–new hire team determines which goals are appropriate to the individual, then work to complete any learning strategies that are needed to fill gaps in cognition or clinical skills. With guidance outlined within the coaching plan, the preceptor fosters deliberate clinical practice and reflective learning as the new nurse integrates specialty practice knowledge with clinical capability.

As CTF components, the three high-end apprenticeships build from a simple knowledge base toward complex integration of knowledge within skilled, professional practice. During orientation, a nurse's discipline-specific knowledge develops from initial learning modules, then builds to conceptual understanding, integration of protocols, to safe clinical practice, to development of reasoning skills and clinical judgment that is unique to a certain specialty. Support for this development is achieved within the CTF via use of written coaching plans that outline standardized knowledge and incorporate specific reflective learning questions with structured discussion to foster critical thinking. Weekly conferences with the preceptor or educator engage the newly hired nurse in active reflection strategies that portray holistic patient care. As new nurses develop skills needed to provide holistic care of patients, they expand their focus on ethical affect, demeanor, and formation as a professional (Benner et al., 2010).

A focus on critical thinking and clinical judgment is core to professional practice and reflective learning (Miraglia & Asselin, 2015). Critical thinking processes, such as clinical reasoning, problem solving, and nursing judgment, intertwine with one's factual knowledge to foster appropriate responses to commonly recurring patient situations. Specialty knowledge becomes part of the nurse's cognitive base, which requires reinforcement via application and repetition to install it in long-term memory (Alfaro-LeFevre, 2016; Benner et al., 2010). This knowledge is the fuel that allows creative critical thinking to develop. Experiential learning in the clinical setting provides practical wisdom that expands reasoning skills. Professionalism and clinical reasoning are crucial steps leading to the individual's acceptance of accountability for their actions and inactions. Preceptors serve as clinical guides for transitioning nurses' developing attitudes and responses that integrate learned knowledge into responsible, effective patient care and professional accountability.

CLINICAL COACHING PLANS

Coaching plans are clinical teaching plans that guide the practice of precepting and foster the development of clinical reasoning skills in the newly hired nurse (Delfino et al., 2014; Nielsen, Lasater, & Stock, 2016; Robbins et al., 2017). The plans provide written guidelines and support that may stimulate development of individual capability, ethical conduct, accountability, and professionalism (VNIP, 2016). Two quasiexperimental studies show positive outcomes from the use of coaching plans with new nurses (Boyer et al., 2017; Robbins et al., 2017).

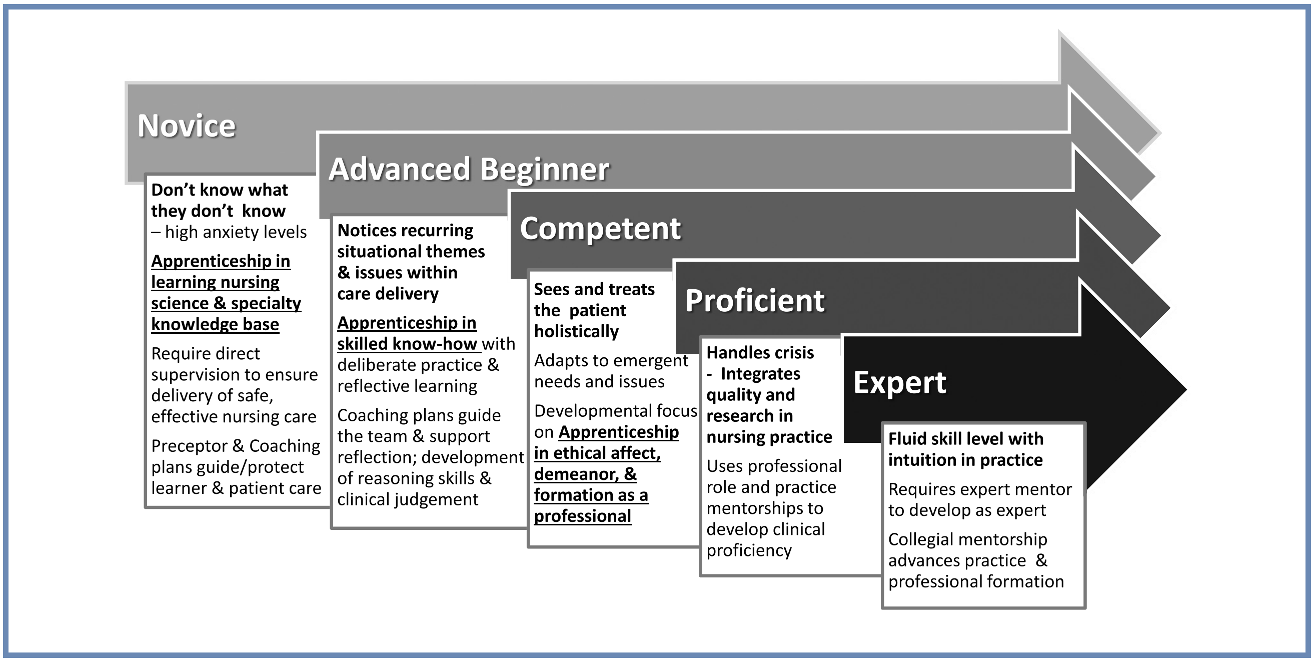

FIGURE 1 Integrating high-end apprenticeships and coaching plans within transitional support. Contact info: boyer274@mail.com.

Coaching plans enhance planning and documentation of a nurse's clinical practice. They also help to ensure consistent communication between preceptors and present specific questions that foster development of critical thinking.

The structure of a coaching plan includes (a) directions for use; (b) a goal statement presented in the manner of providing care; (c) outline of related policies, standardized knowledge, and instructional resources; (d) elements of performance criteria, and (e) reflective learning strategies. Each coaching plan targets a specific goal written in a patient-centered manner and identifies both the standardized knowledge and aspects of practice unique to the specific setting. In coaching plan design, the first step establishes a set of goal statements that target patient-centered care within the specific practice setting. For example, the goal statements in Table 1 outline the specialty of medical-surgical nursing.

Each goal statement becomes the heading for a single-page coaching plan. Within the written plan, the NPD specialist outlines the standardized knowledge with titles of policy or procedure resources, instructional modules, and learning activities recommended for achievement of the goal. By providing a specific outline of cognitive requirements along with instructional strategies, use of the coaching plan encourages the learner to take personal responsibility for content mastery (Robbins et al., 2017). Each plan targets a specific nursing performance goal statement, outlines standardized knowledge that is specific to that goal, and details clinical performance criteria that reveal aspects of goal achievement.

Specific performance criteria outline the core evidence of meeting the overall patient-centered goal statement. The NPD specialist avoids using terms such as *knows, understands, able to*, or *demonstrates* when writing the measurable statements, as these verbs are vague and difficult to measure (Nicolas et al., 2012). Instead, specific action verbs such as *assesses*, *monitors*, *applies*, and *reflects* are used to provide a clear statement of what the learner is expected to achieve. The performance criteria focus on patient care, assessment, planning, and evaluation—rather than focusing simply on the tasks and procedures involved in care. When written at a high level of performance expectations, the coaching plan and care goals prioritize professional nursing practice over completion of the task or procedure (Nielsen et al., 2016). For example, the task of performing an electrocardiogram is inherent to the performance criteria of, "Determines rhythm changes that require immediate intervention" or it moves a step further in complexity with, "Engages correct intervention for specific cardiac rhythm change."

The process of coaching includes self-assessment questions that foster critical thinking development in the new or transitioning nurse. These questions may appear on the coaching plan or on a weekly conference form used for reflective learning. The answers given by the learner are a foundation for discussion and exploration of "what ifs" with the preceptor or educator. Reflective learning occurs with feedback sessions, discussion, storytelling, and questioning strategies engaged by the preceptor or clinical educator (Miraglia & Asselin, 2015). Questions on the coaching plan create a platform for

TABLE 1	Performance Goal Statements That Encompass Medical-Surgical Nursing Specialty
Medical-Surgical Nursing Specialty	
1. Provides geriatric patient care that integrates core issues unique to the population	
2. Manages the surgical patient presenting with underlying medical issues	
3. Prioritizes a multipatient assignment	
4. Anticipates special needs and possible complications seen in medical-surgical patients	
5. Maintains best possible health and well-being for immunocompromised patient	
6. Manages care of patient undergoing orthopedic surgery or fracture stabilization	
7. Ensures optimal health and preventative care for diabetic patient	
8. Manages care of the patient with compromised cardiovascular or respiratory system	
9. Adapts plan of care for the unique needs of pediatric patients from varied age groups	
10. Alleviates patient distress: pain, psychosocial, spiritual, and physical	
11. Addresses unique needs of patients presenting with substance abuse, withdrawal, suicidal ideation, depression, or other mental health issue	

establishing reflection as a deliberate process of thinking critically about clinical experiences to gain personal and professional insight.

When preceptors use coaching plans as designed, they foster development of critical thinking and reflective practice in the new nurse, while documenting evidence of competence or learning needs. The coaching plan is a concrete means of providing "hand-off" communications for subsequent preceptors to track and communicate progression of the new hire. Figure 2 offers an example of the format used for a clinical coaching plan. Formats may vary, but the concepts of presenting standardized knowledge, specific performance criteria, and reflective learning strategies are essential to establish clearly defined expectations, integrate support, and foster critical thinking development (Boyer et al., 2017).

Coaching plans provide a rubric for both learning and competency validation. The plans foster success by providing specific strategies to address discrepancies between various preceptors' performance expectations (Fredickson & Moore, 2014). Using coaching plans also saves time and effort by ensuring concrete, clear communication from one preceptor to the next. The 10–16 statements comprising a set of unit-specific goals or coaching plan statements outline the specialty practice and provide documented evidence of competent practice. Within the CTF, unit-specific coaching plans address the specialty and give evidence of safe and effective nursing practice that adheres to protocol, policies, and procedures within the learner's organization.

SAMPLING AND CONSISTENCY

The CTF applies concepts of *sampling* to competency evaluation to produce systematic, role-specific, evidence collection related to nurse capability. Sampling is defined as the process, act, or technique of choosing a part of a population or set of elements for the purpose of determining characteristics or limitations of the whole (Merriam-Webster, 2017). Although sampling has been used extensively with medical research and population studies, it is less common to consider sampling concepts as part of orientation. A sampling-based competency system extrapolates overall nurse capability to provide safe and effective patient care from observation of a selected sample of competency criteria (Guenter et al., 2015; Lakanmaa et al., 2014; Perla, Provost, & Murray, 2013). Application of sampling concepts allows selection of required competency elements, which reduces the signature requirements within the form, thus decreasing workload for preceptors. The sampling-based approach is seen with national nursing licensure exams, oversight surveys for organizational accreditation, and pharmacological or therapeutic research. When a candidate passes a licensure exam with completion of less than 100 questions, for example, he or she is gaining licensure based on a sample of a sample (Williams, Kim, & Dickison, 2014).

Orientation tools track and record aspects of a transitioning nurse's practice completed according to the organization's policies, procedure, or established protocols. The appropriate sample of orientation performance criteria include high-risk, high-frequency aspects of patient care and nursing judgment, such as medication administration or intravenous therapy management. Orientation tools frequently detail the minutiae of nursing practice with various tasks, procedures, or pieces of equipment that comprise clinical care. Delineating aspects of clinical reasoning is more challenging to achieve (Alfaro-LeFevre, 2016; Nielsen et al., 2016). To meet this challenge, the NPD specialist uses current evidence and professional expertise in writing performance-based criteria as observed in clinical practice. They also ensure adherence to the KISS principle—in this case representing an effort to *Keep It Short and Simple*! This principle helps to guide preceptors and protect them, per se, from the extra workload created by extensive,

Clinical Coaching Plan   Orientee ____________________ Date __________

- **Daily -** *start the day with establishing goals and expectations with the new hire. Move from Simple to Complex.*
- ***Recap what happened the previous day***. Emphasize the successes of the novice and encourage their development of critical thinking skills
- ***Each day, review the charting and computer skills of the new hire***. Assure that care delivery routine is conducive to protecting the safety, complete care, and accurate documentation of the unit's busy flow of patients.
- ***Update the checklist daily***, meet with the educator as needed to discuss goal achievement, include coach/manager if indicated.

Goal Statement: Protects patient wellbeing via prompt, appropriate, intervention for those presenting with complaints of chest pain

Learning Strategies: **Reviews Protocols related to:** Medication management; frequently used cardiac medication drips & their use; transfer of cardiac patients; vasoactive medications; therapeutic hypothermia; ROSC patients; external defibrillation; 12 lead EKG; STEMI Practice lead placement for Phillips 5 lead 6-lead monitor system and EKG	Reviews BLS, ACLS, PALS, and AHA guidelines Complete basic dysrhythmia course **Complete computer or unit based modules for:** Synchronized cardioversion; Transcutaneous Cardiac Pacing; External Defibrillation; Cardiac Rhythms Class; Cardiac Monitor Set up and Lead Placement; Concepts and Life-Threatening Arrhythmias: Foundational Concepts - (Possible) Train the Trainer with Hospital Education on the use of the Life Pak defibrillator

Performance Criteria	Self-assess	Comments	Inits. /Date
Determines cardiac origins of symptoms - Differentiates between Cardiac and GERD symptoms - Considers differential diagnoses - Initiates MONA treatment, if appropriate			
Delivers care based on cardiac rhythm, history & assessment - Interprets 12 lead EKG within 10 minutes of arrival in ED - Differentiates lethal from non-lethal rhythms - Anticipates complications and/or patient change - Initiates STEMI protocol when indicated			
Manages patient's changing needs & ongoing assessment - Monitors for electrolyte or acid/base imbalance - Modifies plan based on assessment of patient status & response to treatments/meds			
Performs external pacing, defibrillation and/or cardioversion - Determines care needs for specific rhythm configurations - Utilizes adult code cart and monito, pacer, or defibrillator			
Assists with cardiac resuscitation - Documents Code Blue accurately - Describes care and issues for the ROSC patient - Explains the use / concerns with Therapeutic Hypothermia - Notifies organ bank and medical examiner as appropriate - Transports patient to receiving unit			

Describe positive experiences, work, accomplishments that occurred this week and why it was positive?

Describe the most challenging experiences or work that occurred this week.

What might have been done differently, to improve outcomes or process?

FIGURE 2 Example of clinical coaching plan. VNIP contact info sboyer@vnip.org office@vnip.org (802) 674-7069.

detailed competency checklists and multifaceted scoring systems. While adhering to the KISS principle, competency validation tools must also be comprehensive and should include both initial and ongoing performance expectations (Beaver et al., 2016). The use of a sampling approach communicates the expectation of proficient aspects of practice, without holding the new hire responsible for that aspect of performance within the first weeks of practice in the agency or specialty. To ensure safe and effective patient care, competency criteria must track elements of whether a nurse (a) provides safe and effective care that adheres to protocols, (b) adapts plan of care to patient's changing needs and priorities, (c) acknowledges limits of own capability or cognition, and (e) seeks assistance and/or resources appropriately

(Beaver et al., 2016; Nicolas et al., 2012; VNIP, 2016). While observing the transitioning nurse's specific clinical performance, the competency validator or preceptor monitors for trends in practice, for example, willingness to ask questions or seeking assistance with tasks.

When considering competency assessment across systems and diverse sites, the NPD specialist must select appropriate performance criteria that encompass clinical practice in the specialty setting (Beaver et al., 2016). The high-risk, high-frequency skills are relatively easy to identify, but writing performance criteria that include nursing judgment requires prioritizing analysis, synthesis, evaluation, and creation over basic aspects of knowledge. The original Bloom's taxonomy contained six levels of development addressing the cognitive base (Bloom, 1956). Although knowledge is a necessary precondition for deep thinking, the practice of nursing is dependent upon thinking well. The development of nurse thinking requires targeting the highest levels of Bloom's cognitive taxonomy and engaging reflective and experiential learning, as well as addressing upper levels within the affective and psychomotor realms (Alfaro-LeFevre, 2016; Benner et al., 2010; Nielsen et al., 2016).

The CTF competency tools detail both initial and ongoing performance expectations for the RN (Beaver et al., 2016). Competence validation is achieved by a preceptor's documentation of observed clinical practice or by verbalization by the new nurse—a method sometimes used with core skills that occur less frequently. The competency tool identifies required elements within the orientation sample with bold script. Directions for the form specify both what sample is required and how evidence is to be collected. Preceptors often document more than the minimum requirements, especially when working with new graduate or new to specialty nurses, but the required elements detail the same expectations for all within a specific nursing role. These elements are the minimum requirements, just as all RNs will complete a minimum of 75 questions on the licensure examination (Williams et al., 2014). In this manner, newly hired nurses, travelers, contractors, and new graduates are held to the same standard requirement for competence validation.

PROFESSIONAL ACCOUNTABILITY

Accountability is an entry-level competency expected of new graduates; yet, a literature search reveals that historically new graduate nurses are not consistently able to demonstrate this crucial trait (Dyess & Sherman, 2009; Krautscheid, 2014). Accountability is defined as the quality or state of accepting responsibility for one's actions—a willingness or obligation to be answerable for one's reasons, causes, outcomes, or motives (Merriam-Webster, 2017). Health professionals often use accountability and responsibility interchangeably; however, accountability means being answerable to a higher authority for one's actions, and responsibility equates with having control or authority over someone or something (Griffith, 2015). Every nurse must be mindful of their level of responsibility, position within the public eye, and accountability as a professional. Accountability is a characteristic of professional practice that includes aspects of actions, inactions, learning, recognition of the limits of capability, and seeking assistance when indicated (Oyetunde & Brown, 2012; Zittel, Moss, O'Sullivan, & Siek, 2016).

The competency tools within the CTF use a statement to detail the critical elements of accountability related to orientation and specialized practice. The new nurse attests to accountability with his or her signature on the competency tool. The accountability statement reads:

> As a licensed, professional nurse, I acknowledge the fact that orientation cannot provide exposure to all aspects of patient care delivery within any specialty. I accept accountability for my professional practice and continued learning. When asked to engage skills, tasks, or other responsibilities that are not familiar, I will access appropriate resources for assistance, information, or guidance. These resources may include written directions, procedure manuals, a learning module, or the expertise of colleagues. I will ensure that each patient that comes under my supervision receives safe, effective care that adheres to all established protocols (VNIP, 2017b, p. 6)

The agency educator or preceptor introduces the orientation forms and this concept of accountability during initial discussions with the newly hired nurse. A crucial issue with accountability is the nurse's ability to recognize the limits of his or her own expertise, understanding, or competency and to respond in a proactive manner. When new nurses recognize that they have reached the limits of their practice, the appropriate response is to engage assistance, resources, or colleagues to ensure safe, effective patient care that adheres to protocols and standards of practice. In this manner, accountability includes responsibility for knowledge and skills development related to any gap in cognition or capability (Zittel et al., 2016). Observation of clinical practice provides evidence of the clear, concrete, accountability criteria as delineated by NPD specialists.

PRECEPTOR DEVELOPMENT AND SUPPORT

A unique feature of the CTF is integration of the preceptor development system as a core, comprehensive, and essential component (Delfino et al., 2014; Mann-Salinas et al., 2014; Robbins et al., 2017). Preceptors provide significant protection as they safeguard both patient and learner while fostering a new nurse's clinical reasoning development (Nielsen et al., 2016). While ensuring this safe learning environment, the preceptor collects evidence of clinical performance via the competency-based orientation tools. Although preceptor development and support is a core component of the CTF, a future article will address the unique aspects of both preceptor development and their unique roles within the framework.

IMPLEMENTATION

The CTF has been implemented in part or whole in numerous agencies across the nation, including urban, rural, critical access, and tertiary care centers (VNIP, 2017a). The VNIP website, www.vnip.org, hosts a white paper outlining research and implementation projects occurring since the original new graduate internship program. The organization currently collaborates with military treatment facilities as they adapt and adopt the framework for their unique, diverse environment (Boyer et al., 2017; Robbins et al., 2017).

Although many agencies have engaged the CTF accountability statement within their orientation tools, analysis of the impact of this statement is incomplete. In the meantime, the statement itself stimulates scrutiny of the concepts of accountability. One nursing program dean requested the accountability statement as published, for use within their academic program. The statement provides a foundation for discussions with nursing students related to accountability concepts within the reality of professional nursing. Nurse leaders and educators in some settings have welcomed the specific, concrete statement and the intrinsic message related to professional practice and continuous learning expectations.

The collaborative, nonprofit VNIP organization developed coaching plan tools to address development of work organization skills and core elements of specialty practice for multiple acute care settings, especially a burn intensive care unit, emergency department, adult intensive care units, and maternal child health units. Implementation studies engaged quasiexperimental use of coaching plans with positive feedback from participants (Delfino et al., 2014; Hawkins & Exstrom, 2014; Robbins et al., 2017). A recurring theme of study responses shows that coaching plans provide structure for standardized knowledge, planning, competency assessment, and critical thinking development. The study results showed positive impacts on retention, a reduction in potential errors, and reported savings on orientation costs (Delfino et al., 2014; Hawkins & Exstrom, 2014; Robbins et al., 2017).

The CTF coaching plan delivers a rubric for learning with linked performance criteria that give evidence of a learner's meeting the overall goal statement. A study in an urban medical center revealed the value of having a clinical judgment model and rubric (Nielsen et al., 2016). Findings from the study indicate that a structured framework provided objective means of performance evaluation, while fostering clinical judgment in the new nurse. Coaching plans are only one component of the CTF intervention; however, participant comments reveal the advantages of added structure, standardized knowledge outlines, concrete performance criteria, and specific reflective learning strategies (Robbins et al., 2017).

CONCLUSION

The call for a radical transformation in nursing education emphasizes the need for accountability, reflective learning, and apprenticeships that address knowledge integration, ethical comportment, and professional formation (Benner et al., 2010). The use of competency sampling, a specific accountability statement, and integration of the three high-end apprenticeships within standardized coaching plans are core concepts addressed within the CTF. The framework targets professional practice with performance criteria written in a patient-centered manner. The CTF integrates these core concepts within a tested delivery framework that adapts to the setting and specialty. Sampling technique is at the core of making the process achievable within a framework that simplifies the added effort and responsibility of precepting. The tools incorporate CTF concepts within a set of forms and precepts that are adaptable to each setting, agency, and population. Framework components come together into a methodology that is applied to new hires entering the agency at varied levels of practice experience. NPD specialists are responsible for ensuring a form that clearly identifies professional practice, supports critical thinking development, ensures documentation of specific evidence, and communicates the issue of accountability.

Preceptors familiar with coaching plans support the concept and reality of having resource files of standardized plans in the same manner that nursing has used standardized nursing care plans. Within the CTF, the focus of the plan shifts from the patient to the new care provider. The practice of using standardized coaching plans taps into the current evidence, "brain trust," and specialty expertise provided within a collaborative, professional network. NPD specialists and preceptors individualize selected coaching plans to the unit, patient population, and learning needs of the preceptee. These plans provide concrete, concise, and clear directions for both learning and performance expectations, while guiding development of critical thinking capability. Overall, the CTF represents an efficient system for new staff on-boarding or clinical transition to a new specialty that holds professional nurses accountable for their practice, professionalism, and learning.

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A US military Role 2 forward surgical team database study of combat mortality in Afghanistan

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BACKGROUND: Timely and optimal care can reduce mortality among critically injured combat casualties. US military Role 2 surgical teams were deployed to forward positions in Afghanistan on behalf of the battlefield trauma system. They received prehospital casualties, provided early damage control resuscitation and surgery, and rapidly transferred casualties to Role 3 hospitals for definitive care. A database was developed to capture Role 2 data.

METHODS: A retrospective review and descriptive analysis were conducted of battle-injured casualties transported to US Role 2 surgical facilities in Afghanistan from February 2008 to September 2014. Casualties were analyzed by mortality status and location of death (pretransport, intratransport, or posttransport), military affiliation, transport time, injury type and mechanism, combat mortality index–prehospital (CMI-PH), and documented prehospital treatment.

RESULTS: Of 9,557 casualties (median age, 25.0 years; male, 97.4%), most (95.1%) survived to transfer from Role 2 facility care. Military affiliation included US coalition forces (37.4%), Afghanistan National Security Forces (23.8%), civilian/other forces (21.3%), Afghanistan National Police (13.5%), and non-US coalition forces (4.0%). Mortality differed by military affiliation ($p < 0.001$). Among fatalities, most were Afghanistan National Security Forces (30.5%) civilian/other forces (26.0%), or US coalition forces (25.2%). Of those categorized by CMI-PH, 40.0% of critical, 11.2% of severe, 0.8% of moderate, and less than 0.1% of mild casualties died. Most fatalities with CMI-PH were categorized as critical (66.3%) or severe (25.9%), whereas most who lived were mild (56.9%) or moderate (25.4%). Of all fatalities, 14.0% died prehospital (pretransport, 5.8%; intratransport, 8.2%), and 86.0% died at a Role 2 facility (posttransport). Of fatalities with documented transport times (median, 53.0 minutes), most (61.7%) were evacuated within 60 minutes.

CONCLUSIONS: Role 2 surgical team care has been an important early component of the battlefield trauma system in Afghanistan. Combat casualty care must be documented, collected, and analyzed for outcomes and trends to improve performance. (*J Trauma Acute Care Surg.* 2018;85: 603–612. Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.)

LEVEL OF EVIDENCE: Therapeutic/Care Management, level IV.

KEY WORDS: Afghanistan; combat casualty care; mortality; role 2 forward surgical team; trauma.

The United States and other North Atlantic Treaty Organization countries have structured their military trauma systems into four "roles" of care that depict a continuum of increasing capability with each higher role number.[1–3] At Role 2 facilities, damage control resuscitation and surgery provided by forward surgical teams can bridge the time, space, and capability gap between Role 1 prehospital care provided at or near the point of wounding and Role 3 and Role 4 medical treatment facilities that have more robust hospital, intensive, and definitive care as well as holding capacity.

The survival of critically injured combat casualties is contingent upon timely delivery of optimal care.[4–8] Although a recent topic of debate,[9,10] it was with the premise that critically injured casualties would benefit from reduced time between injury and surgical care that forward-positioned surgical teams were deployed and utilized on the battlefield of Afghanistan.[11–14] Time to surgical capability was further reduced with the increase in number and dispersion of these surgical teams across the battlefield and with a mandate for reducing the time of prehospital transport of critically injured combat casualties to 60 minutes or less.[4]

Despite challenges innate to small, mobile Role 2 surgical facilities with limited personnel and resources, mortality outcomes measured through died-of-wound rates were previously found to be no different when compared with Role 3 surgical facilities for combat casualties during the conflict in Iraq.[14] Although a comprehensive study of combat casualties in Afghanistan did find died-of-wounds mortality to be higher for critically injured

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casualties initially treated at Role 2 versus Role 3 facilities,[4] a follow-on analysis of the same data demonstrated that casualties first delivered to a Role 2 facility had lower odds of killed-in-action mortality compared with those first delivered to a Role 3 facility.[6] Although strategic, operational, and tactical differences between the conflicts in Afghanistan and Iraq shaped and impacted respective trauma systems and outcomes within those countries,[15] all these studies highlight a need for additional detailed study and analysis of mortality outcome by evacuation time, prehospital interventions, and role of care.

In addition to analyzing trauma system data in its entirety, data pertaining specifically to each component of trauma care delivery at and between roles of care are essential to military trauma system performance improvement. Although significant advances in documentation and data collection were made during the conflict in Afghanistan, data capture was most robust at Role 3 and Role 4 facilities, where personnel, automation, and other resources were more abundant and tasked to facilitate such activities. However, working within the construct of a resource-constrained environment, documentation tools and a Role 2 database were developed by the US Department of Defense Joint Trauma System to aggregate data from Role 2 surgical facilities in order to inform leaders and gain insight on casualties, trauma care delivery, and morbidity and mortality outcomes.[16–18] Using data from the Role 2 database, the primary outcomes measured and purpose of this current study were to compare casualties by mortality status (lived vs. died) and evaluate fatalities by location of death (pretransport, intratransport, or posttransport to Role 2 facilities) and military affiliation and secondarily to further examine US fatalities by injury severity and body region injured.

METHODS

A review and data analysis were conducted using the Department of Defense Joint Trauma System Role 2 Database. This database collected patient data (i.e., diagnosis, Role 1 and 2 treatment, and outcomes) from clinical providers at Role 2 facilities. Adult (≥18 years) trauma patients were eligible for study if a battle injury was incurred during the Afghanistan conflict from February 2008 to September 2014. Patients were excluded from study if they had an unknown discharge status or were categorized with a nonbattle injury. This study was reviewed and approved by the US Army Institute of Surgical Research regulatory department and was determined to be exempt.

Patients were classified by demographic characteristics. Military affiliation included US coalition forces, non-US coalition forces, Afghanistan National Security Forces (ANSF), Afghanistan National Police, and civilian or other forces, where other forces included patients from an undisclosed nation who were engaged in fighting but were not a prisoner of war.

A dominant injury type was assigned for each patient among four categories: penetrating, blunt, penetrating and blunt, and burn. If a patient incurred multiple injury types to include burn, the dominant injury type was categorized as burn. A dominant mechanism of injury was assigned for each patient among four categories: explosion, gunshot wound, motor vehicle crash, and other (e.g., falls). If circumstances indicated multiple mechanisms of injury to include explosion, the dominant mechanism of injury was categorized as explosion.

As traditional hospital documentation practices were not mandated and enforced for Role 2 facilities, injury severity scores were not assessed. Thus, no specific injury severity score data were available in the Role 2 database. However, as a surrogate, the combat mortality index–prehospital (CMI-PH) as developed by Le and colleagues[19] at the US Army Institute of Surgical Research was used as a measure of physiological trauma injury severity as well as a predictor of mortality among battlefield casualties. The CMI-PH was calculated using Role 1 and Role 2 admission vital signs (i.e., heart rate [HR], systolic blood pressure, and Glasgow Coma Scale [GCS] score). The CMI-PH was calculated using the following equation: CMI-PH = HR + SBP + GCS-total, where HR equals 0 if patient HR was 60 to 100 beats/min or 1 if patient HR was less than 60 or greater than 100 beats/min; systolic blood pressure (SBP) equals 0 if patient SBP was 100 mm Hg or greater or 1 if patient SBP was less than 100 mm Hg; and GCS-total equals 0 if patient GCS-total was 14 or greater, 1 if patient GCS-total was 9 to 13, or 2 if patient GCS-total was 3 to 8. A CMI-PH score of 0 was categorized as mild, 1 as moderate, 2 as severe, and 3 or 4 as critical.

Additionally, US coalition force fatality data were matched to the Armed Forces Medical Examiner System database to further evaluate these casualties by maximum Abbreviated Injury Scale (mAIS) score and New Injury Severity Score (NISS). The mAIS is the highest injury severity code assigned to a patient (range, 1–6). Patients may have multiple distinct injuries coded equally as highest in the same body region and/or different body regions. The NISS is the sum of the squares of the top three injuries with the highest injury severity codes regardless of body region (range, 1–75). If a patient has an injury with an mAIS of 6, the NISS is automatically a 75. The primary injured body region was determined by where the mAIS occurred. If the mAIS occurred in more than one primary injured body region, this was noted.

Locations of death were pretransport, intratransport, or posttransport to Role 2 facilities. As locations of death were not explicitly documented in the patient record, they were ascertained using other documented parameters. Pretransport death included patients whose record indicated that the patient died in the field prior to transport and/or received no en route care coupled with lack of documented vital signs. Intratransport death included patients who were determined to be alive when placed on a transport platform, had recorded vital signs or en route care, but died prior to arrival or were designated as dead on arrival to a Role 2 facility. Posttransport death included patients who were alive at time of Role 2 facility arrival but died prior to Role 2 transfer. Patients were determined to be alive at arrival if they had any documented vital signs depicting life, if the patient record had any comment indicating signs of life, or if the patient received treatment at a Role 2 facility. Heroic resuscitative efforts and diagnostic interventions (e.g., cardiopulmonary resuscitation, endotracheal tube, central line placement, focused abdominal sonography for trauma, abdominal wound exploration) were not used as evidence for proof of life.

Prehospital interventions included those used for hemorrhage control (e.g., tourniquet, pressure dressing, hemostatic dressing), airway (e.g., nasopharyngeal airway, cricothyroidotomy, oral or nasal intubation), breathing (e.g., needle decompression, chest tubes, chest seals and other occlusive dressings, bag-valve mask or tube ventilation), circulation (e.g., intravenous or intraosseous access, parenteral fluids and blood, cardiopulmonary resuscitation), hypothermia (e.g., blanket, hypothermia prevention management kit, space blanket), and other care (e.g., splints, cervical spine immobilization, eye shields).

Descriptive statistics were used to analyze casualties by mortality status (lived vs. died) and location of death (pretransport, intratransport, or posttransport) and fatalities by military affiliation. Other characteristics evaluated included demographics, transport time, time at Role 2 facility, injury type, injury mechanism, CMI-PH, prehospital intervention, and prehospital medication. Additional US coalition force fatality characteristics included mAIS, NISS, and primary injured body region. A χ^2 or analysis of variance was used to determine significant differences as appropriate. Because of the small sample size of some categories, comparisons included (1) all patients who died versus patients who lived and (2) US coalition forces versus all other patients. Analyses were performed using SAS, version 9.4 (SAS Institute, Inc., Cary, NC).

RESULTS

Of 15,310 patient records available for review, 12,780 patients had potential for further study based on country, age, traumatic injury, and date range criteria (Fig. 1). An additional 428 patients were excluded because of "unknown" discharge status or misclassification, and 2,795 patients were excluded because of nonbattle injury. Of the remaining 9,557 patients available for final analysis, 9,092 lived and 465 died before or during treatment at Role 2 facilities. Characteristics are provided for all casualties by mortality status and location of death (Table 1) and for fatalities by military affiliation (Table 2). The study population had a median age of 25.0 years (interquartile range [IQR], 21.0–30.0 years) and was primarily male (97.4%; 9,308/9,557), and most (95.1% [9,092/9,557]) survived to transfer from Role 2 facility care.

Military Affiliation

The distribution of casualties by military affiliation included US coalition forces (37.4% [3,578/9,557]), ANSF (23.8% [2,271/9,557]), civilian/other forces (21.3% [2,034/9,557]), Afghanistan National Police (13.5% [1,290/9,557]), and non-US coalition forces (4.0% [384/9,557]). Mortality differed by military affiliation ($p < 0.001$), with most fatalities categorized as either ANSF (30.5% [142/465]), civilian/other forces (26.0% [121/465]), or US coalition forces (25.2% [117/465]).

Transport Time and Time at Role 2 Facility

Of the 53.6% (5,122/9,557) of the study population with a documented interval transport time from injury to Role 2 arrival, 56.9% (2,916/5,122) had a time that was greater than 60 minutes, and 43.1% (2,206/5,122) had a time that was 60 minutes or less. The total population median transport time was 75.0 minutes (IQR, 45.0–157.5 minutes), and the median time of stay at a Role 2 facility was 3.0 hours (IQR, 1.25–5.93 hours). Of the

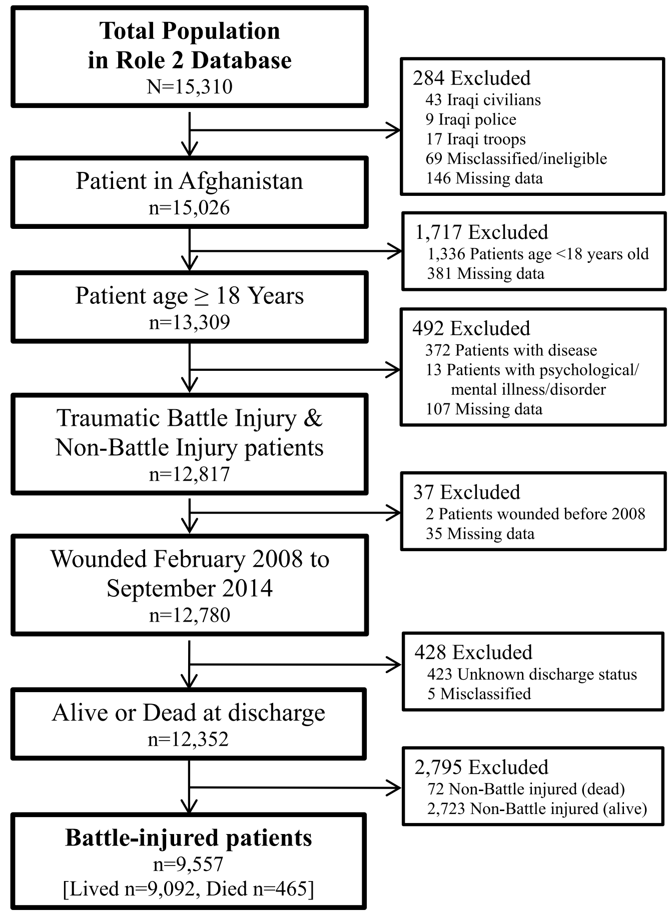

Figure 1. Study sample (n = 9,557) from Role 2 database maintained by the Department of Defense Joint Trauma System by inclusion and exclusion criteria.

39.4% (183/465) of fatalities with documented transport times (median [IQR], 53.0 minutes [30.0–80.5 minutes]), most (61.7% [113/183]) were evacuated within 60 minutes, and the median time at a Role 2 facility was 1.0 hours (IQR, 0.20–1.99 hours). Documented times from point of injury to death were available for 32.3% (150/465) of fatalities, with a median time of 1.69 hours (IQR, 0.88–3.28 hours).

Injury Type and Mechanism

Penetrating injury was the most frequently observed injury type in both those who lived (60.8% [5,524/9,092]) and died (75.9% [353/465]). Explosion was the most frequently observed mechanism of injury in both those who lived (58.8% [5,349/9,092]) and died (50.1% [233/465]). A greater proportion of gunshot wounds were seen among fatalities (lived 27.8% [2,531/9,092] vs. died 41.7% [194/465]) when compared with explosion (lived 58.8% [5,349/9,092] vs. died 50.1% [233/465]), motor vehicle crash (lived 2.0% [183/9,092] vs. died 2.4% [11/465]), and other mechanisms (lived 5.9% [538/9,092] vs. died 1.7% [8/465]). Thus, lethality was greatest for gunshot wounds (7.1% [194/2,725]), followed by motor vehicle crash (5.7% [11/194]), explosion (4.2% [233/5,349]), and other (1.5% [8/546]).

TABLE 1. Study Characteristics by Mortality Status of Casualties (n = 9,557) Injured in Battle During Afghanistan Conflict From February 2008 to September 2014

			Died								
	Total		Pretransport		Intratransport		Posttransport		Lived		
Table 1	n	%	n	%	n	%	n	%	n	%	p*
Casualties	9,557	100.0	27	0.3	38	0.4	400	4.2	9,092	95.1	
Age, median (IQR), y	25.0	21.0, 30.0	28.0	21.0, 34.0	25.0	21.0, 30.0	25.0	21.0, 30.0	25.0	22.0, 30.0	0.717
Male	9,308	97.4	25	92.6	36	94.7	388	97.0	8,859	97.4	0.832
Military affiliation											<0.001
Coalition, US	3,578	37.4	15	55.6	8	21.1	94	23.5	3,461	38.1	
Coalition, non-US	384	4.0	1	3.7	2	5.3	10	2.5	371	4.1	
ANSF	2,271	23.8	5	18.5	12	31.6	125	31.3	2,129	23.4	
Afghanistan National Police	1,290	13.5	0	0.0	7	18.4	65	16.3	1,218	13.4	
Civilian/other forces	2,034	21.3	6	22.2	9	23.7	106	26.5	1,913	21.0	
Transport time, injury to Role 2 arrival	5,122	53.6	15	55.6	12	31.6	156	39.0	4,939	54.3	<0.001
Time ≤60 min	2,206	23.1	8	29.6	8	21.1	97	24.3	2,093	23.0	
Time >60 min	2,916	30.5	7	25.9	4	10.5	59	14.8	2,846	31.3	
Transport time, median (IQR), min	75.0	45.0, 157.5	60.0	36.0, 100.0	58.0	35.0, 110.0	50.0	30.0, 80.0	78.0	45.0, 165.0	0.204
Time at Role 2, median (IQR), h	3.00	1.25, 5.93	0.00	0.03, 0.53	0.00	0.03, 0.33	1.00	0.25, 2.22	3.00	1.33, 6.17	0.136
Injury type	9,045	94.6	27	100.0	36	94.7	395	98.8	8,587	94.4	<0.001
Penetrating	5,877	61.5	16	59.3	27	71.1	310	77.5	5,524	60.8	
Blunt	2,279	23.9	5	18.5	1	2.6	31	7.8	2,242	24.7	
Penetrating and blunt	740	7.7	6	22.2	7	18.4	41	10.3	686	7.6	
Burn	149	1.6	0	0.0	1	2.6	13	3.3	135	1.5	
Injury mechanism	9,047	94.7	26	96.3	35	92.1	385	96.3	8,601	94.6	<0.001
Explosion	5,582	58.4	13	48.2	17	44.7	203	50.8	5,349	58.8	
Gunshot wound	2,725	28.5	11	40.7	18	47.4	165	41.3	2,531	27.8	
Motor vehicle crash	194	2.0	2	7.4	0	0.0	9	2.3	183	2.0	
Other	546	5.7	0	0.0	0	0.0	8	2.0	538	5.9	
Combat Mortality Index–Prehospital	8,510	89.0	3	11.1	14	36.8	238	59.5	8,255	90.8	<0.001
Mild	5,172	54.1	0	0.0	0	0.0	2	0.5	5,170	56.9	
Moderate	2,326	24.3	0	0.0	0	0.0	18	4.5	2,308	25.4	
Severe	590	6.2	0	0.0	0	0.0	66	16.5	524	5.8	
Critical	422	4.4	3	11.1	14	36.8	152	38.0	253	2.8	
Documented prehospital intervention	13,398	100.0	10	0.1	81	0.6	969	7.2	12,338	92.1	
Bleeding intervention, tourniquet	1,532	11.4	6	60.0	8	9.9	109	11.2	1,409	11.4	0.960
Bleeding intervention, other	2,807	21.0	0	0.0	14	17.3	171	17.6	2,622	21.3	0.0010
Airway intervention	834	6.2	0	0.0	21	25.9	208	21.5	605	4.9	<0.001
Breathing intervention	161	1.2	0	0.0	1	1.2	26	2.7	134	1.1	<0.001
Circulation intervention	1,651	12.3	0	0.0	13	16.0	164	16.9	1,474	11.9	<0.001
Fluids	673	5.0	0	0.0	0	0.0	29	3.0	644	5.2	<0.001
Blood	80	0.6	0	0.0	0	0.0	6	0.6	74	0.6	1.000
Hypothermia intervention	5,984	44.7	4	40.0	22	27.2	277	28.6	5,681	46.0	<0.001
Other prehospital intervention	429	3.2	0	0.0	2	2.5	14	1.4	413	3.3	<0.001
Documented prehospital medication	2,348	100.0	0	0.0	1	<0.1	70	3.0	2,277	97.0	
Analgesics	1,297	55.2	0	0.0	0	0.0	31	44.3	1,266	55.6	0.052
Fentanyl	338	14.4	0	0.0	0	0.0	10	14.3	328	14.4	1.000
Ketamine	125	5.3	0	0.0	0	0.0	6	8.6	119	5.2	0.273
Morphine	534	22.7	0	0.0	0	0.0	5	7.1	529	23.2	0.001
Other	300	12.8	0	0.0	0	0.0	10	14.3	290	12.7	0.718
Antibiotics	382	16.3	0	0.0	0	0.0	6	8.6	376	16.5	0.073
Other or unknown medication	669	28.5	0	0.0	1	100.0	33	47.1	635	27.9	<0.001

*Comparison is between all patients who died and patients who lived.

TABLE 2. Study Characteristics by Military Affiliation for Battle-Injured Fatalities (n = 465) Who Died Before or During Treatment at Role 2 Surgical Facilities During Afghanistan Conflict From February 2008 to September 2014

	Total		Coalition Forces: US		Coalition Forces: Non-US		ANSF		Afghanistan National Police		Civilian/Other Forces		
	n	%	n	%	n	%	n	%	n	%	n	%	p*
Fatalities	465	100.0	117	25.2	13	2.8	142	30.5	72	15.5	121	26.0	
Age, median (IQR), y	25.0	21.0, 30.0	24.0	21.0, 28.0	26.0	24.0, 29.0	24.0	21.0, 28.0	25.0	23, 30.0	25.0	21.0, 35.0	<0.001
Male	449	96.6	117	100.0	13	100.0	139	97.9	70	97.2	110	90.9	0.076
Mortality location													<0.001
Posttransport	400	86.0	94	80.3	10	76.9	125	88.0	65	90.3	106	87.6	
Intratransport	38	8.2	8	6.8	2	15.4	12	8.5	7	9.7	9	7.4	
Pretransport	27	5.8	15	12.8	1	7.7	5	3.5	0	0.0	6	5.0	
Transport time, injury to Role 2 arrival	183	39.4	52	44.4	8	61.5	45	31.7	32	44.4	46	38.0	0.099
Time ≤60 min	113	24.3	37	31.6	6	46.2	26	18.3	18	25.0	26	21.5	
Time >60 min	70	15.1	15	12.8	2	15.4	19	13.4	14	19.4	20	16.5	
Transport time, median (IQR), min	53.0	30.0, 80.5	43.0	25.0, 80.0	56.0	42.5, 74.0	41.0	27.0, 96.0	60.0	35.0, 106	58	45.0, 75.0	0.663
Time at Role 2, median (IQR), h	1.00	0.20, 1.99	0.00	0.19, 0.85	1.00	0.13, 1.05	1.00	0.18, 1.92	2.00	0.23, 3.72	1.00	0.32, 2.22	0.794
Time from injury to death	150	32.3	35	29.9	7	53.8	38	26.8	28	38.9	42	34.7	
Injury to death, median (IQR), h	1.69	0.88, 3.28	1.27	0.72, 2.98	1.28	0.75, 1.70	1.75	0.92, 3.37	2.92	1.16, 5.85	1.69	0.87, 2.65	
Injury type	458	98.5	116	99.1	13	100.0	140	98.6	70	97.2	119	98.3	0.372
Penetrating	353	75.9	86	73.5	10	76.9	107	75.4	54	75.0	96	79.3	
Blunt	37	8.0	13	11.1	2	15.4	10	7.0	4	5.6	8	6.6	
Penetrating and blunt	54	11.6	15	12.8	1	7.7	17	12.0	9	12.5	12	9.9	
Burn	14	3.0	2	1.7	0	0.0	6	4.2	3	4.2	3	2.5	
Injury mechanism	446	95.9	115	98.3	12	92.3	137	96.5	69	95.8	113	93.4	0.551
Explosion	233	50.1	65	55.6	8	61.5	68	47.9	38	52.8	54	44.6	
Gunshot wound	194	41.7	44	37.6	4	30.8	66	46.5	28	38.9	52	43.0	
Motor vehicle crash	11	2.4	3	2.6	0	0.0	2	1.4	2	2.8	4	3.3	
Other	8	1.7	3	2.6	0	0.0	1	0.7	1	1.4	3	2.5	
Combat Mortality Index–Prehospital	255	54.8	52	44.4	3	23.1	85	59.9	47	65.3	68	56.2	<0.001
Mild	2	0.4	0	0.0	0	0.0	1	0.7	0	0.0	1	0.8	
Moderate	18	3.9	0	0.0	0	0.0	7	4.9	5	6.9	6	5.0	
Severe	66	14.2	2	1.7	1	7.7	26	18.3	13	18.1	24	19.8	
Critical	169	36.3	50	42.7	2	15.4	51	35.9	29	40.3	37	30.6	
Documented prehospital intervention	1,025	100.0	278	27.1	43	4.2	318	31.0	183	17.9	203	19.8	
Bleeding intervention, tourniquet	123	12.0	42	15.1	6	14.0	30	9.4	18	9.8	27	13.3	0.066
Bleeding intervention, other	185	18.0	35	12.6	11	25.6	64	20.1	38	20.8	37	18.2	0.006
Airway intervention	229	22.3	69	24.8	8	18.6	63	19.8	50	27.3	39	19.2	0.273
Breathing intervention	27	2.6	7	2.5	0	0.0	11	3.5	4	2.2	5	2.5	1.000
Circulation intervention	142	13.9	49	17.6	6	14.0	45	14.2	22	12.0	20	9.9	0.042
Fluids	29	2.8	4	1.4	0	0.0	10	3.1	6	3.3	9	4.4	0.137
Blood	6	0.6	0	0.0	0	0.0	2	0.6	1	0.5	3	1.5	0.198

Continued next page

TABLE 2. *(Continued)*

	Total		Coalition Forces: US		Coalition Forces: Non-US		ANSF		Afghanistan National Police		Civilian/Other Forces		
	n	%	n	%	n	%	n	%	n	%	n	%	p*
Hypothermia intervention	303	29.6	73	26.3	12	27.9	101	31.8	47	25.7	70	34.5	0.166
Other prehospital intervention	16	1.6	3	1.1	0	0.0	4	1.3	4	2.2	5	2.5	0.578
Documented prehospital medication	71	100.0	6	8.5	1	1.4	40	56.3	14	19.7	10	14.1	
Analgesics	31	43.7	3	50.0	1	100.0	15	37.5	3	21.4	5	50.0	0.679
Fentanyl	10	14.1	1	16.7	0	0.0	5	12.5	1	7.1	3	30.0	1.000
Ketamine	6	8.5	1	16.7	0	0.0	4	10.0	0	0.0	0	0.0	0.384
Morphine	5	7.0	1	16.7	0	0.0	0	0.0	0	0.0	1	10.0	0.172
Other	10	14.1	0	0.0	1	100.0	6	15.0	2	14.3	1	10.0	0.580
Antibiotics	6	8.5	0	0.0	0	0.0	4	10.0	1	7.1	1	10.0	1.000
Other or unknown medication	34	47.9	3	50.0	0	0.0	18	45.0	9	64.3	4	40.0	1.000

*Comparison is between US coalition force patients and all other patients.

Combat Mortality Index and Location of Death

From the total study population, 89.0% (8,510/9,557) had sufficient data needed to evaluate injury severity by CMI-PH. As categorized by CMI-PH, 40.0% (169/422) of critical, 11.2% (66/590) of severe, 0.8% (18/2,326) of moderate, and less than 0.1% (2/5,172) of mild casualties died. Most fatalities with CMI-PH were categorized as critical (66.3% [169/255]) or severe (25.9% [66/255]), whereas most who lived were mild (56.9% [5,170/8,255]) or moderate (25.4% [2,308/8,255]).

Of all fatalities, 14.0% (65/465) died prehospital (pretransport 5.8% [27/465]; intratransport 8.2% [38/465]), and 86.0% (400/465) died at a Role 2 facility (posttransport). Subtracting the 65 prehospital deaths from the total study population of 9,557 battle-injured casualties provided a remaining casualty population of 9,492 who received treatment at a Role 2 facility. As 400 of these casualties died, the percentage died of wounds (%DOW) at Role 2 facilities in this study population was equal to 4.2% ([400/9,492] × 100).

Prehospital Interventions and Medications

All documented prehospital interventions, except tourniquets and blood, differed between those who lived and those who died. When comparing those who lived with those who died, a larger proportion of casualties who lived received more other bleeding interventions (21.3% [2,622/12,338] vs. 18.0% [185/1,025]; $p < 0.001$) and hypothermia interventions (46.0% [5,681/12,338] vs. 29.6% [303/1,025]; $p < 0.001$). Additionally, a smaller proportion of casualties who lived received more airway (4.9% [605/12,338] vs. 22.3% [229/1,025]; $p < 0.001$), breathing (1.1% [134/12,338] vs. 2.6% [27/1,025]; $p < 0.001$), and circulation (11.9% [1,474/12,338] vs. 13.9% [142/1,025]; $p < 0.001$) interventions. For documented medications administered, a larger proportion of casualties who lived received more morphine (23.2% [529/2,277] vs. 7.0% [5/71]; $p = 0.001$), whereas other or unknown medications were provided in greater proportion to casualties who died (27.9% [635/2,277] vs. 47.9% [34/71]; $p < 0.001$).

US Coalition Force Fatalities

All 117 US coalition force fatalities captured by this study were matched to the Armed Forces Medical Examiner System database. Characteristics for these fatalities by primary injured body regions (Table 3 and Fig. 2) include a median NISS of 50.0 (IQR, 41.0–66.0) and an mAIS of 4 or greater in 95.7% (112/117) of this population. Only one primary injured body region was affected in 72.6% (85/117) of fatalities, two primary injured body regions in 25.6% (30/117), and three primary injured body regions in 1.7% (2/117). The primary injured body region most frequently involved in these fatalities was the thorax (38.5% [45/117]), followed by the head (27.4% [32/117]) and lower extremity, pelvis, and buttocks (25.6% [30/117]). The primary injured body region with the highest median NISS was the head (75.0 [IQR, 57.0–75.0]), which also had the most fatalities with an mAIS of 6, as well as the most fatalities having only one isolated primary body region. As 35.9% (42/117) of fatalities had head and/or spine primary body regions affected, the remaining 64.1% (75/117) of fatalities had damage and hemorrhage solely in other primary injured body regions.

TABLE 3. Maximum Abbreviated Injury Scale Primary Injured Body Region of US Coalition Force Fatalities Matched to Armed Forces Medical Examiner System Database (n = 117) Who Died of battle Wounds During Afghanistan Conflict From February 2008 to September 2014

		First Primary Body Region								
		Head	**Face**	**Neck**	**Thorax**	**Abdomen**	**Spine**	**Upper Extremity**	**Lower Extremity, Pelvis, Buttocks**	**External (Skin) and Thermal Injuries**
Second primary body region	None	25	1	2	23	14	5	0	15	0
	Head		0	0	3	0	2	1	0	0
	Face			0	0	0	0	0	0	0
	Neck				1	0	0	0	0	0
	Thorax					5	2	1	10*	0
	Abdomen						1	1	3	0
	Spine							0	0	0
	Upper extremity								1	0
	Lower extremity, pelvis, buttocks									1
	External (skin) and thermal injuries									

*Two of these fatalities also had a third primary body region affected, one of "head" and the other of "abdomen".

Of the 117 US coalition force fatalities, 23 were Role 1 prehospital deaths and 94 were Role 2 facility deaths. Subtracting the 23 US prehospital deaths from the total US casualty population of 3,578 battle-injured casualties provided a remaining US casualty population of 3,555 who received treatment at a Role 2 facility. As 94 of these casualties died, the US coalition % DOW at Role 2 facilities in this study population was equal to 2.6% ([94/3,555] × 100).

DISCUSSION

Increasing the rate of casualty survival from traumatic injury at and between each role of care should be a primary goal for performance improvement efforts within a military trauma system. Hemorrhage and its sequela are a major cause of death in trauma patients.[8,20–24] During the recent conflicts in Afghanistan and Iraq, hemorrhage accounted for 90.9% of prehospital and 80.1% of in-hospital deaths from potentially survivable injuries.[22,23] Thus, hemorrhage control should remain an important area of focus for military trauma systems, along with reducing the time between critical injury and receiving a lifesaving or limb-saving medical capability. As Role 3 and Role 4 medical treatment facilities have more robust resources to provide hospital, intensive, and definitive care, it is especially important to assess patient transport, care, and outcomes that occur prior to reaching these facilities, in the more austere and resource-constrained Role 1 prehospital and Role 2 forward surgical team environments.

The importance of data from Role 1 and Role 2 databases and their ability to translate gaps and lessons learned have been reported.[8,16–18,25–28] Previous Role 2 database studies of casualties from the Afghanistan conflict have provided descriptive

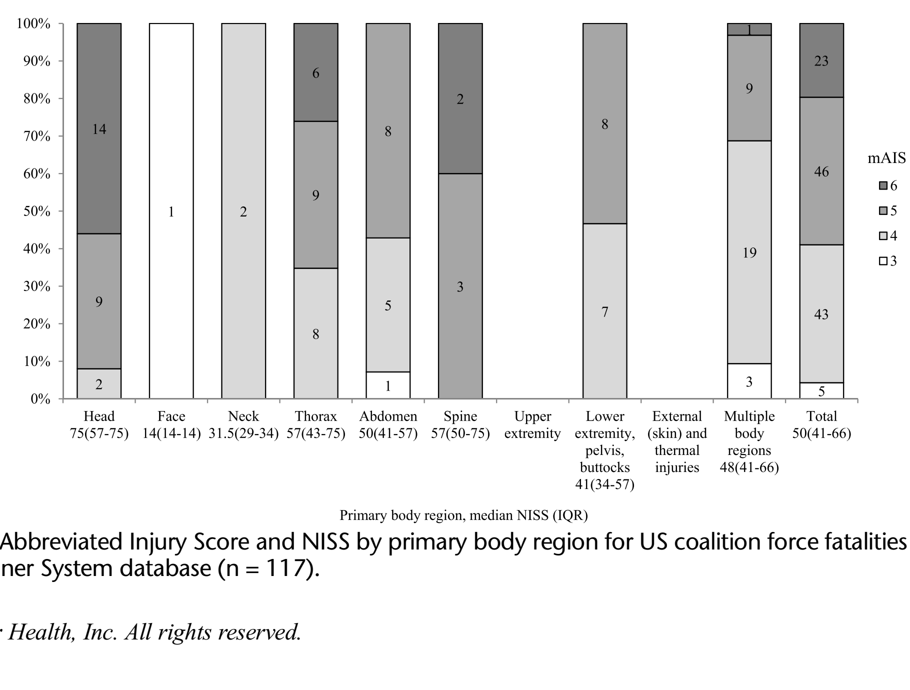

Figure 2. Maximum Abbreviated Injury Score and NISS by primary body region for US coalition force fatalities matched to Armed Forces Medical Examiner System database (n = 117).

analyses on patient profiles of and common injuries treated at Role 2 facilities[16] and type and mode of prehospital transports used to evacuate casualties from Role 1 to Role 2 facilities,[17] as well as transport and en route treatment of casualties between Role 2 and Role 3 facilities.[18] This current study expands beyond previous studies by assessing mortality outcomes among battle-injured casualties transported to and treated at Role 2 facilities during the Afghanistan conflict by location of death and military affiliation. However, for all these studies, data were limited primarily to the Role 2 database, which was not designed to capture details for all injuries, casualties, and fatalities on the battlefield.

Although the study sample distribution by military affiliation noted the largest proportion of casualties was from US coalition forces, the largest proportion of fatalities was seen among ANSF, even though more fatalities were categorized as critical among US coalition forces, and the median prehospital transport times to Role 2 facilities among US coalition forces and ANSF fatalities were not found to be statistically different. However, for those who had documented transport times, a larger proportion of US coalition force fatalities (31.6%) were found to have been evacuated within 60 minutes as compared with ANSF fatalities (18.3%). Although autopsy data were not available for other military affiliation categories, for US coalition force fatalities, of note was that 38.5% had affected primary body regions in noncompressible areas (thorax), and 27.4% had multiple affected primary body regions.

In contrast to a higher proportion of prehospital fatalities reported in previous casualty mortality studies of Afghanistan and Iraq,[20,21,23] most (86.0%) of current study sample fatalities died after arrival and while receiving Role 2 facility care. This may be somewhat artifactual of the Role 2 database given that entry into the database was contingent upon activation of Role 2 surveillance. As the current study relied on casualties that activated Role 2 surveillance, as well as Role 2 personnel to collect and report these data to the Role 2 database, the totality of prehospital deaths was not accounted for during the study time period. This may be particularly so for those casualties who died overtly and near instantaneously, as well as patients who died during transport, as criteria for entry into the Role 2 database were treatment at a Role 2 facility. As observed by a 2012 composite of battlefield deaths in Afghanistan and Iraq,[23] 35.2% of fatalities were instantaneous, 52.1% were acute (minutes to hours) prehospital, and only 12.7% of casualties died of wounds after reaching a medical treatment facility.

In addition to not capturing all prehospital casualties and fatalities, the Role 2 database also did not capture individuals that bypassed Role 2 facilities, as well as data and morbidity and mortality outcomes from non–Role 2 facilities. Furthermore, not all Role 2 casualties and fatalities that occurred were recorded and collected by the Role 2 database, as this database was reliant on Role 2 personnel to capture such data while constrained by resources. Thus, overall case fatality rate, as well as prehospital deaths as percentage killed in action, could not be determined. However, %DOW for Role 2 facility casualties and fatalities was calculated and found to be 4.2%. Although 43.1% of casualties were transported in 60 minutes or less compared with 67.1% in a previous study on transport time,[4] this DOW value was analogous to the overall %DOW of 4.3% previously reported for Afghanistan.[4,8,15] As %DOW is an outcome that can be monitored by a Role 2 facility,[29] this metric can be used and reported for performance improvement by individual surgical teams as well as in aggregate.

Substantial advances in medical documentation and data collection were made during the Afghanistan and Iraq conflicts, amassing the largest repository of combat trauma data in US history. However, data were most robust from Role 4 and Role 3 medical treatment facilities and progressively less so at Role 2 and Role 1 closer to the point of injury. Although the Department of Defense Joint Trauma System implemented standalone software programs to facilitate combat casualty care data capture by forward battlefield providers, these databases rely on resources, connectivity, and the consistent and continuous willingness and compliance of numerous individual units and personnel to use the programs in an environment where data collection and reporting were additional tasks to conduct if time were available versus an integral and expected part of duties. Additionally, data that were captured were being done so mostly by untrained personnel. Therefore, there is nominal assurance of accuracy of reporting, coding, or even data entry.

Subsequently, Role 2 casualty data may be complete, partially complete, or nonexistent, depending on the facility. Thus, the data from the Role 2 database may not be completely representative or inclusive of all casualties treated at or before this role of care. As non-US casualties and fatalities were often lost to follow-up, outcomes and autopsies were not available for further analysis. Without complete autopsies, an accurate description and extent of injuries cannot be provided for fatalities.

After almost 17 years of combat operations, resulting in nearly 60,000 US casualties[30] and innumerable non-US casualties, nonmedical and medical leaders must mandate, train, resource, and enforce comprehensive and continuous documentation and data collection practices at Role 2 facilities. These efforts are needed to support performance improvement, optimize trauma care delivery, and ensure compliance that would otherwise be lost to lack of time, interest, or willingness. If damage control resuscitation and surgery are expectations of a Role 2 facility on the battlefield, the US Department of Defense should also require and facilitate the documentation and data collection of such major interventions.

As hemorrhage continues to be a major cause of death in both battlefield and nonbattlefield environments,[8,20–24] future research efforts must include novel and evolutionary methods to prevent, recognize, and treat hemorrhagic events as soon after injury as possible, particularly from noncompressible truncal hemorrhage, which is currently in need of viable prehospital solutions. Advancements must occur for truncal hemostasis and blood resuscitation to support both presurgical and forward surgical efforts.[31–33] These advances must cover the full spectrum, from point of injury hemostatic interventions to transfusion strategies to medical and procedural interventions, which prevent and mitigate the physiological consequences of hemorrhage. Important areas of focus should include increased involvement from both medical and nonmedical senior leadership; public awareness and education; noncompressible hemorrhage control; prevention, recognition, and treatment of hemorrhagic shock; and evaluation and treatment of intracranial bleeding.

CONCLUSIONS

Role 2 facility care and prehospital care prior to and during transport to Role 2 facilities are important early components of a military joint service battlefield trauma system. Efforts to mandate, train, resource, and enforce medical documentation and data collection practices are required. Filling gaps in data will help to identify medical capability gaps, direct training and equipment procurement, and support future performance improvement and research efforts. Ultimately, meaningful and comprehensive data are paramount to further reduction of battlefield morbidity and mortality.

AUTHORSHIP

R.S.K. and A.M.S. had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. R.S.K. and A.M.S. were involved in study concept and design. A.M.S., E.L.M., and E.A.M.-S. were involved in data collection, consolidation, and organization. R.S.K. and A.M.S. were involved in statistical analysis. R.S.K., A.M.S., E.L.M., J.M.G., S.A.S., F.K.B., Z.T.S., J.B.H., S.C.N., and E.A.M.-S. were involved in acquisition, analysis, or interpretation of data. R.S.K. and A.M.S. drafted the manuscript. R.S.K., A.M.S., E.L.M., J.M.G., S.A.S., F.K.B., Z.T.S., J.B.H., S.C.N., and E.A.M.-S. critically revised the manuscript for important intellectual content. E.A.M.-S. provided administrative, technical, or material support. R.S.K. and E.A.M.-S. supervised the study.

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DISCLOSURE

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A Review of Casualties Transported to Role 2 Medical Treatment Facilities in Afghanistan

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ABSTRACT Critically injured trauma patients benefit from timely transport and care. Accordingly, the provision of rapid transport and effective treatment capabilities in appropriately close proximity to the point of injury will optimize time and survival. Pre-transport tactical combat casualty care, rapid transport with en route casualty care, and advanced damage control resuscitation and surgery delivered early by small, mobile, forward-positioned Role 2 medical treatment facilities have potential to reduce morbidity and mortality from trauma. This retrospective review and descriptive analysis of trauma patients transported from Role 1 entities to Role 2 facilities in Afghanistan from 2008 to 2014 found casualties to be diverse in affiliation and delivered by various types and modes of transport. Air medical evacuation provided transport for most patients, while the shortest transport time was seen with air casualty evacuation. Although relatively little data were collected for air casualty evacuation, this rapid mode of transport remains an operationally important method of transport on the battlefield. For prehospital care provided before and during transport, continued leadership and training emphasis should be placed on the administration and documentation of tactical combat casualty care as delivered by both medical and non-medical first responders.

INTRODUCTION

Time and treatment capability are important factors for the survival of critically injured combat casualties.[1] Prehospital treatment capability, rapid prehospital transport, and early hospital and surgical treatment capability have been shown to improve trauma outcomes.[1–8] For combat and other overseas contingency operations, U.S. military doctrine delineates a progressive and integrated system for casualty care designed to ensure opportunity for timely treatment of critically injured casualties.[9–12] This system begins with the casualty at the point of injury and ends in a hospital located outside of the active area of operations.

The U.S. military trauma system and care continuum has been organized into four "roles" of care, with a commensurate increase in capability with each higher role number.[9–12] Role 1 consists of emergency first responder and tactical combat casualty care (TCCC) provided by self, buddy, medic, or other provider, at the point of injury, casualty collection point, or aid station. Role 2, or limited hospital capability, consists of advanced damage control resuscitation and surgery provided by small, mobile, forward-positioned medical treatment facilities and surgical teams. Role 3, or full but short-term hospital capability, consists of surgery, intensive care, postoperative care, and specialty care provided by large, semi-permanent medical treatment facilities (e.g., combat support hospitals). Casualties requiring full but longer term hospital capability can receive such care at Role 4 medical treatment facilities located in safe havens outside of the continental U.S., or ultimately, within the continental U.S.

Military prehospital combat trauma care, known as TCCC, consists of three phases of care: care under fire, tactical field care, and tactical evacuation (TACEVAC) care.[12–15] For the TACEVAC phase of care, air, ground, and water modes of transportation have been utilized to transfer patients from Role 1 to other roles of care. Based on doctrine,[12] tactical or prehospital patient transports have also been further categorized as medical evacuation (MEDEVAC) and casualty evacuation (CASEVAC). Published definitions for these evacuation or patient movement terms remain imprecise and vary between military services, thus leaving room for interpretation and debate as well as resultant confusion in the literature.

The doctrinal intent of providing appropriate and effective medical capability at or near the anticipated point of injury is to optimize time to treatment and subsequently casualty survival. Given that critically injured combat casualties can potentially benefit from early prehospital care, rapid transport, en route care, and early hospital care, this study proposed to

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characterize battlefield casualties who underwent TACEVAC from a Role 1 entity to a Role 2 medical treatment facility as evaluated through data available for type and mode of transport. Specific aims of the study included providing accurate definitions for casualty transport methods that could be used as a standard for future studies; utilizing a prehospital and in-hospital combat mortality index to evaluate injury severity; characterizing the study population by patient affiliation, type and mode of transport, and year of transport; and identifying type and frequency of prehospital interventions and medications utilized.

METHODS

Conducted was a retrospective descriptive sub-analysis of previously described trauma casualties from a Role 2 registry.[16] The Role 2 registry used for this study was maintained and consolidated by the Department of Defense Joint Trauma System. Role 2 registry data were previously collected and entered into the registry by Role 2 facility members immediately following casualty events. Patients included in this current study received treatment at a Role 2 medical treatment facility, were 18 yr or older, sustained traumatic injury in Afghanistan from February 2008 to September 2014, had data available for TACEVAC transport type (MEDEVAC and CASEVAC) and mode (Air, Ground, Water), and were alive at the time they were picked up by patient transport. Transport times reported reflect the total time interval from initial injury to Role 2 facility arrival. This study met U.S. Army Institute of Surgical Research regulatory requirements.

Medical regulating has previously been defined as a process that selects destination medical treatment facilities for patients being medically evacuated and provides identification of and assignment to medical treatment facilities capable of providing required definitive, recuperative, or restorative care.[17] For this study, MEDEVAC was defined as a designated, dedicated, and regulated or unregulated prehospital patient transfer platform utilized by an ambulance unit that has medical personnel and medical equipment assets to perform en route care, and CASEVAC was defined as a designated or non-designated, non-dedicated, and unregulated prehospital patient transfer platform utilized by a non-ambulance unit that may or may not have medical personnel and medical equipment assets to provide en route care. As both MEDEVAC and CASEVAC provide tactical or prehospital transport on the battlefield, they were grouped into an overarching category termed TACEVAC (Table I).

The Combat Mortality Index (CMI) Prehospital (PH) and In Hospital (IH) are measures used to predict mortality among battlefield casualties. These measures were used in this study as a surrogate for trauma injury severity among study patients due to the lack of injury severity score in the dataset. The CMI was developed by Le and colleagues at the U.S. Army Institute of Surgical Research.[18] Preliminary efforts and comparisons demonstrate that the CMI was a better predictor of mortality than the existing revised trauma score, field triage score, and shock index. The CMI scoring system uses clinical variables of heart rate (HR), systolic blood pressure (SBP), Glasgow coma score (GCS), base deficit (BD), and International Normalized Ratio (INR) in a dichotomous (HR and SBP) or integral (GCS, INR, BD) manner to develop a CMI-PH score ranging from 0 to 4 and a CMI-IH score ranging from 0 to 8.

In this study, CMI-PH was calculated using available prehospital vital signs (SBP n = 1,635; HR n = 1,775); otherwise, CMI-PH admission vital signs (SBP n = 8,452; HR n = 8,363) were used to calculate CMI-PH. Admission vital signs and lab results were used to calculate CMI-IH. If a patient arrived to a Role 2 facility and was documented as "dead," and was not successfully resuscitated, the patient was classified as dead on arrival.

In the case of a patient with multiple injury types or mechanisms, burn was generalized as the dominant injury type, whereas explosion was generalized as the dominant injury mechanism. Therefore, injury type was categorized as (1) any burn injury, (2) penetrating injury, (3) blunt injury, and (4) penetrating and blunt injury, whereas mechanism of injury was categorized as (1) any explosion, (2) gunshot wound, (3) motor vehicle crash, (4) fall, and (5) other.

Descriptive analyses were used to evaluate patient characteristics by affiliation, transport type and mode, and year. Categories of patient characteristics included demographics, transport time, injury type and mechanism, combat mortality index, mortality, and prehospital interventions and medications. Chi-square or Fisher's exact test was used to determine significant differences where appropriate. Analyses were performed using Stata (StataCorp. 2015. Stata Statistical Software: Release 14. College Station, TX, USA: StataCorp LP).

RESULTS

Of 15,310 patient records available for review, 4,751 did not meet inclusion criteria (Fig. 1). Remaining were a total of 10,559 patients available for exploratory analysis by patient affiliation (Table II), transport type and mode (Table III), and year (Table IV). Given the large proportion of missing data on type and mode of transport, we compared the demographic characteristics of the study population (n = 10,559) with the population missing type and mode of transport data (n = 2,221) to identify any differences. There were differences in some of the demographics of the study population (n = 10,559) versus population missing type and mode of transport data (n = 2,221); thus, the data are not missing completely at random (i.e., the probability of "missingness" does not depend on the values of observed or unobserved data). However, we believe that this difference is not related to the type or mode of transport; therefore, the data are missing at random.[19]

Casualties included in this study had a median age of 25 (IQR 21–30) yr and were primarily male (97.1%; 10,253/10,559).

TABLE I. Glossary of Terms for Type of Transport for the Purposes of this Study

Medical Evacuation (MEDEVAC)	Designated, dedicated, and regulated[a] or unregulated prehospital patient transfer platform utilized by an ambulance unit that has medical personnel and medical equipment assets to perform en route care.
Casualty Evacuation (CASEVAC)	Designated or non-designated, non-dedicated, and unregulated prehospital patient transfer platform utilized by a non-ambulance unit that may or may not have medical personnel and medical equipment assets to provide en route care.
Tactical Evacuation (TACEVAC)	Overarching category for both medical evacuation and casualty evacuation.

[a]Medical regulating is the process that selects destination medical treatment facilities for patients being medically evacuated and provides identification of and assignment to medical treatment facilities capable of providing required definitive, recuperative, or restorative care.

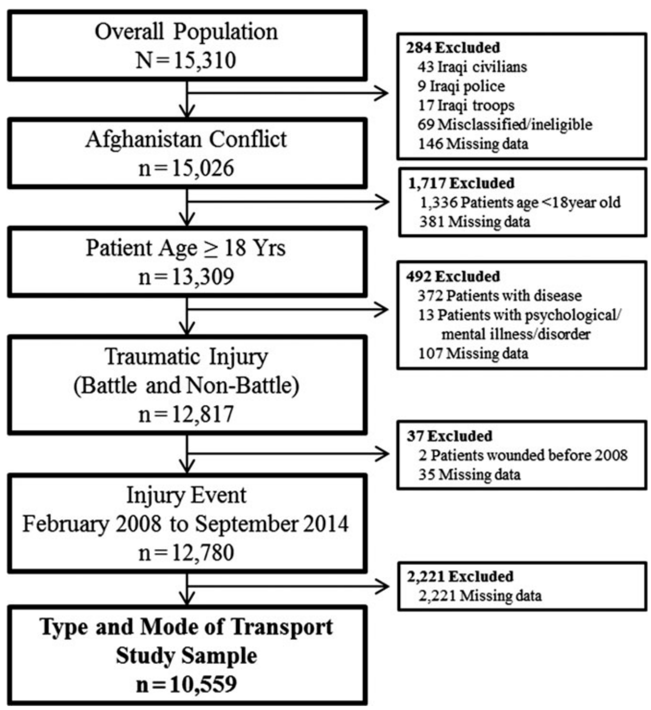

FIGURE 1. Study sample (n = 10,559) from Role 2 registry maintained by the Department of Defense Joint Trauma System by inclusion and exclusion criteria.

Most patients were categorized as battle injury (80.3%; 8,479/10,559). Patient affiliation included 37.1% (3,914/10,559) U.S. military, 40.2% (4,244/10,559) non-U.S. military, and 22.7% (2,401/10,559) civilian or unknown. Most patients (76.6%; 8,085/10,559) were injured from 2010 to 2012. In 2008 and from 2011 through 2014, most patients were non-U.S. military, whereas in 2009 and 2010, most patients were U.S. military.

Transport Type and Mode, and Transport Time

No documented mode of transport by water was found in the study sample. As per Table III, casualties were primarily transported by MEDEVAC Air (76.8%; 8,109/10,559), followed by MEDEVAC ground (10.8%; 1,137/10,559), CASEVAC ground (9.6%; 1,017/10,559), and then CASEVAC air (2.8%; 296/10,559). Of the 52.8% (5,575/10,559) of the study sample who had transport times, the most rapid method of transport was by CASEVAC air with a median time of 48 (IQR 30–96) min, followed by CASEVAC ground at 68 (IQR 30–180) min, MEDEVAC air at 75 (IQR 45–137) min, and then MEDEVAC ground at 87 (35–224) min. By patient affiliation (Table II), U.S. military forces received the most rapid transport with a median time of 67 (IQR 41–130) min, followed by civilian or unknown at 77 (IQR 44–180) min, and then non-U.S. military at 80 (IQR 45–154) min. More patient transports occurred in the year 2011 (33.8%; 3,570/10,559) as compared with other years (Fig. 2). Additionally, MEDEVAC air was the dominant type and mode of transport from 2008 to 2013, then CASEVAC ground became dominant in 2014. Median transport time was fastest in 2012 (64 min; IQR 40–126 min), and slowest in 2014 (86 min; IQR 45–179 min).

Injury Type and Mechanism

Overall, the most common injury type was exclusively penetrating (53.5%; 5,644/10,559), followed by exclusively blunt, combined penetrating and blunt, and then burn. By patient affiliation (Table II), penetrating injury was also the leading type of injury for non-U.S. military (60.7%; 2,575/4,244) and civilian or unknown (62.3%; 1,497/2,401); however, for U.S. military, blunt injury was the leading type (43.8%; 1,714/3,914). Overall, the dominant mechanism of injury was explosion (48.3%; 5,101/10,559), followed by gunshot wound, and motor vehicle crash. This order for injury mechanism was the same by each patient affiliation (Table II), transport type and mode (Table III), and during each year (Table IV).

Combat Mortality Index and Mortality

Overall, for both CMI-PH and CMI-IH, most patients, with a CMI available, were categorized as mild (55.7%, 5,881/10,559; 26.4%, 2,789/10,559, respectively). This pattern was also consistent by year (Table IV). For CMI-PH, differences were seen between patient affiliation groups (Table II) in all categories with U.S. military having the highest percent of patients rated as mild and the lowest percent of patients rated as moderate, severe, and critical. Differences for CMI-PH were also seen between transport type and mode groups (Table III) for mild and severe categories with CASEVAC air transporting a lower percent of patients rated as mild and MEDEVAC ground transporting a higher percent of patients rated as severe. For CMI-IH, differences were seen between patient affiliation groups (Table II) in all categories with U.S. military having the highest percent of patients rated as mild

TABLE II. Study Characteristics by Patient Affiliation for Trauma-Eligible Adult Patients (n = 10,559) Treated at Role 2 Medical Treatment Facilities During Afghanistan Conflict from February 2008 to September 2014

		Patient Affiliation, No. (%)			
Category	All, No. (%)	Military, U.S.	Military, Non-U.S.[a]	Civilian or Unknown	p-Value
Patients	10,559 (100.0)	3,914 (37.1)	4,244 (40.2)	2,401 (22.7)	
Age, median (IQR), yr	25 (21–30)	24 (22–29)	24 (21–28)	26 (22–35)	<0.001
Male	10,253 (97.1)	3,791 (96.9)	4,203 (99.0)	2,259 (94.1)	<0.001
Battle injury	8,479 (80.3)	3,239 (82.8)	3,473 (81.8)	1,767 (73.6)	<0.001
Non-battle injury	2,080 (19.7)	675 (17.2)	771 (18.2)	634 (26.4)	<0.001
Transport type and mode to Role 2					
Medical Evacuation, air	8,109 (76.8)	3,475 (88.8)	2,952 (69.6)	1,682 (70.1)	<0.001
Medical Evacuation, ground	1,137 (10.8)	151 (3.9)	644 (15.2)	342 (14.2)	<0.001
Casualty Evacuation, air	296 (2.8)	76 (1.9)	142 (3.3)	78 (3.2)	<0.001
Casualty Evacuation, ground	1,017 (9.6)	212 (5.4)	506 (11.9)	299 (12.5)	<0.001
Transport time, injury to Role 2 arrival	5,575 (52.8)	2,292 (58.6)	2,100 (49.5)	1,183 (49.3)	
Time >60 min	3,189 (30.2)	1,237 (31.6)	1,250 (29.5)	702 (29.2)	0.054
Time ≤60 min	2,386 (22.6)	1,055 (27.0)	850 (20.0)	481 (20.0)	<0.001
Elapsed time, median (IQR), min	75 (44–150)	67 (41–130)	80 (45–154)	77 (44–180)	<0.001
Injury type	9,887 (93.6)	3,583 (91.5)	4,040 (95.2)	2,264 (94.3)	
Penetrating	5,644 (53.5)	1,572 (40.2)	2,575 (60.7)	1,497 (62.3)	<0.001
Blunt	3,248 (30.8)	1,714 (43.8)	1,017 (24)	517 (21.5)	<0.001
Penetrating and blunt	795 (7.5)	242 (6.2)	362 (8.5)	191 (8.0)	<0.001
Burn	200 (1.9)	55 (1.4)	86 (2.0)	59 (2.5)	0.009
Injury mechanism	9,930 (94.0)	3,676 (93.9)	3,999 (94.2)	2,255 (93.9)	
Explosion	5,101 (48.3)	2,277 (58.2)	1,941 (45.7)	883 (36.8)	<0.001
Gunshot wound	2,600 (24.6)	572 (14.6)	1,234 (29.1)	794 (33.1)	<0.001
Motor vehicle crash	959 (9.1)	183 (4.7)	499 (11.8)	277 (11.5)	<0.001
Falls	379 (3.6)	224 (5.7)	93 (2.2)	62 (2.6)	<0.001
Other	891 (8.4)	420 (10.7)	232 (5.5)	239 (10.0)	<0.001
Combat mortality index – prehospital[b]	9,452 (89.5)	3,592 (91.8)	3,757 (88.5)	2,103 (87.6)	
0 Mild	5,881 (55.7)	2,507 (64.1)	2,225 (52.4)	1,149 (47.9)	<0.001
1 Moderate	2,465 (23.3)	885 (22.6)	970 (22.9)	610 (25.4)	0.024
2 Severe	631 (6.0)	107 (2.7)	319 (7.5)	205 (8.5)	<0.001
3–4 Critical	475 (4.5)	93 (2.4)	243 (5.7)	139 (5.8)	<0.001
Combat mortality index – in hospital	4,102 (38.8)	1,715 (43.8)	1,547 (36.5)	840 (35.0)	
0–1 Mild	2,789 (26.4)	1,358 (34.7)	955 (22.5)	476 (19.8)	<0.001
2–3 Moderate	928 (8.8)	280 (7.2)	387 (9.1)	261 (10.9)	<0.001
4–5 Severe	283 (2.7)	52 (1.3)	149 (3.5)	82 (3.4)	<0.001
6–8 Critical	102 (1.0)	25 (0.6)	56 (1.3)	21 (0.9)	0.006
Mortality	470 (4.5)	126 (3.2)	219 (5.2)	125 (5.2)	
Died en route or dead on arrival	83 (0.8)	33 (0.8)	36 (0.8)	14 (0.6)	0.440
Died while at Role 2	387 (3.7)	93 (2.4)	183 (4.3)	111 (4.6)	<0.001
Documented prehospital intervention	16,766 (100.0)	5,546 (33.1)	7,268 (43.3)	3,952 (23.6)	
Bleeding intervention, tourniquet	1,539 (9.2)	549 (9.9)	651 (9.0)	339 (8.6)	0.061
Bleeding intervention, other[c]	3,422 (20.4)	923 (16.6)	1,679 (23.1)	820 (20.7)	<0.001
Airway intervention[d]	895 (5.3)	208 (3.8)	438 (6.0)	249 (6.3)	<0.001
Breathing intervention[e]	164 (1.0)	37 (0.7)	85 (1.2)	42 (1.1)	0.014
Circulation intervention[f]	1,017 (6.1)	321 (5.8)	457 (6.3)	239 (6.0)	0.501
Hypothermia intervention[g]	6,975 (41.6)	2,409 (43.4)	2,893 (39.8)	1673 (42.3)	<0.001
Documentation, prehospital en route	2,179 (13.0)	855 (15.4)	827 (11.4)	497 (12.6)	<0.001
Other prehospital intervention[h]	575 (3.4)	244 (4.4)	238 (3.3)	93 (2.4)	<0.001
Documented prehospital medication	2,754 (100.0)	918 (33.3)	1,168 (42.4)	668 (24.3)	
Analgesic, morphine	622 (22.6)	269 (29.3)	226 (19.3)	127 (19.0)	<0.001
Analgesic, fentanyl	377 (13.7)	153 (16.7)	139 (11.9)	85 (12.7)	0.005
Analgesic, ketamine	140 (5.1)	39 (4.2)	72 (6.2)	29 (4.3)	0.086
Analgesic, other	406 (14.7)	159 (17.3)	167 (14.3)	80 (12.0)	0.011
Antibiotic	406 (14.7)	88 (9.6)	201 (17.2)	117 (17.5)	<0.001
Other or unknown medication	803 (29.2)	210 (22.9)	363 (31.1)	230 (34.4)	<0.001

[a]Non-U.S. military includes North Atlantic Treaty Organization (NATO) and Afghan forces.
[b]Prehospital combat mortality index was calculated using prehospital vital signs or initial vital signs upon presentation to Role 2.
[c]Other bleeding interventions include direct pressure, hemostatic dressing, field dressing, and other or unknown dressing.
[d]Airway interventions include prehospital airway, definitive airway, and airway adjuncts to assist respiration.
[e]Breathing interventions include needle decompression, chest seals and other occlusive dressings, and chest tubes.
[f]Circulation interventions include intravenous access, interosseous access, and cardiopulmonary resuscitation (CPR).
[g]Hypothermia interventions include blanket, body bag, hypothermia prevention management kit, space blanket, and other warming devices.
[h]Other prehospital interventions include splints, C-spine immobilization, and eye shields.

TABLE III. Study Characteristics by Transport Type and Mode for Trauma-Eligible Adult Patients ($n = 10{,}559$) Treated at Role 2 Medical Treatment Facilities During Afghanistan Conflict from February 2008 to September 2014.

		Type and Mode of Transport, No. (%)				
		Medical Evacuation		Casualty Evacuation		
Category	All, No. (%)	Air	Ground	Air	Ground	*p*-Value
Patients	10,559 (100.0)	8,109 (76.8)	1,137 (10.8)	296 (2.8)	1,017 (9.6)	
Age, median (IQR), yr	25 (21–30)	25 (21–30)	25 (21–30)	25 (21–28)	25 (22–30)	0.088
Male	10,253 (97.1)	7,902 (97.4)	1,088 (95.7)	284 (95.9)	979 (96.3)	0.001
Battle injury	8,479 (80.3)	6,710 (82.7)	784 (69.0)	256 (86.5)	729 (71.7)	<0.001
Non-battle injury	2,080 (19.7)	1,399 (17.3)	353 (31.0)	40 (13.5)	288 (28.3)	<0.001
Patient affiliation						
Military, U.S.	3,914 (37.1)	3,475 (42.9)	151 (13.3)	76 (25.7)	212 (20.8)	<0.001
Military, non-U.S.[a]	4,244 (40.2)	2,952 (36.4)	644 (56.6)	142 (48)	506 (49.8)	<0.001
Civilian or unknown	2,401 (22.7)	1,682 (20.7)	342 (30.1)	78 (26.4)	299 (29.4)	<0.001
Transport time, injury to Role 2 arrival	5,575 (52.8)	4,229 (52.2)	547 (48.1)	171 (57.8)	628 (61.8)	
Time >60 min	3,189 (30.2)	2,471 (30.5)	338 (29.7)	59 (19.9)	321 (31.6)	0.001
Time ≤60 min	2,386 (22.6)	1,758 (21.7)	209 (18.4)	112 (37.8)	307 (30.2)	<0.001
Elapsed time, median (IQR), min	75 (44–150)	75 (45–137)	87 (35–224)	48 (30–96)	68 (30–180)	<0.001
Injury type	9,887 (93.6)	7,578 (93.5)	1,070 (94.1)	282 (95.3)	957 (94.1)	
Penetrating	5,644 (53.5)	4,292 (52.9)	584 (51.4)	175 (59.1)	593 (58.3)	0.001
Blunt	3,248 (30.8)	2,504 (30.9)	389 (34.2)	67 (22.6)	288 (28.3)	<0.001
Penetrating and blunt	795 (7.5)	634 (7.8)	75 (6.6)	33 (11.1)	53 (5.2)	0.001
Burn	200 (1.9)	148 (1.8)	22 (1.9)	7 (2.4)	23 (2.3)	0.727
Injury mechanism	9,930 (94.0)	7,619 (94.0)	1,059 (93.1)	287 (97.0)	965 (94.9)	
Explosion	5,101 (48.3)	4,145 (51.1)	425 (37.4)	145 (49.0)	386 (38.0)	<0.001
Gunshot wound	2,600 (24.6)	1,918 (23.7)	271 (23.8)	96 (32.4)	315 (31.0)	<0.001
Motor vehicle crash	959 (9.1)	587 (7.2)	215 (18.9)	16 (5.4)	141 (13.9)	<0.001
Falls	379 (3.6)	292 (3.6)	51 (4.5)	6 (2.0)	30 (2.9)	0.115
Other	891 (8.4)	677 (8.3)	97 (8.5)	24 (8.1)	93 (9.1)	0.851
Combat mortality index – prehospital[b]	9,452 (89.5)	7,328 (90.4)	1,020 (89.7)	214 (72.3)	890 (87.5)	
0 Mild	5,881 (55.7)	4,624 (57.0)	600 (52.8)	123 (41.6)	534 (52.5)	<0.001
1 Moderate	2,465 (23.3)	1,895 (23.4)	261 (23.0)	60 (20.3)	249 (24.5)	0.494
2 Severe	631 (6.0)	459 (5.7)	94 (8.3)	17 (5.7)	61 (6.0)	0.007
3–4 Critical	475 (4.5)	350 (4.3)	65 (5.7)	14 (4.7)	46 (4.5)	0.204
Combat mortality index – in hospital	4,102 (38.8)	3,233 (39.9)	445 (39.1)	53 (17.9)	371 (36.5)	
0–1 Mild	2,789 (26.4)	2,245 (27.7)	279 (24.5)	35 (11.8)	230 (22.6)	<0.001
2–3 Moderate	928 (8.8)	697 (8.6)	118 (10.4)	13 (4.4)	100 (9.8)	0.006
4–5 Severe	283 (2.7)	214 (2.6)	36 (3.2)	5 (1.7)	28 (2.8)	0.528
6–8 Critical	102 (1.0)	77 (0.9)	12 (1.1)	0 (0.0)	13 (1.3)	0.257
Mortality	470 (4.5)	346 (4.3)	62 (5.5)	22 (7.4)	40 (3.9)	
Died en route or dead on arrival	83 (0.8)	65 (0.8)	11 (1.0)	1 (0.3)	6 (0.6)	0.622
Died while at Role 2	387 (3.7)	281 (3.5)	51 (4.5)	21 (7.1)	34 (3.3)	0.004
Documented prehospital intervention	16,766 (100.0)	13,677 (81.6)	1,180 (7.0)	644 (3.8)	1,265 (7.5)	
Bleeding intervention, tourniquet	1,539 (9.2)	1,284 (9.4)	66 (5.6)	74 (11.5)	115 (9.1)	<0.001
Bleeding intervention, other[c]	3,422 (20.4)	2,469 (18.1)	306 (25.9)	186 (28.8)	461 (36.4)	<0.001
Airway intervention[d]	895 (5.3)	753 (5.5)	78 (6.6)	34 (5.3)	30 (2.4)	<0.001
Breathing intervention[e]	164 (1.0)	138 (1.0)	5 (0.4)	16 (2.5)	5 (0.4)	<0.001
Circulation intervention[f]	1,017 (6.1)	861 (6.3)	38 (3.2)	63 (9.8)	55 (4.3)	<0.001
Hypothermia intervention[g]	6,975 (41.6)	5,804 (42.4)	545 (46.2)	173 (26.8)	453 (35.8)	<0.001
Documentation, prehospital en route	2,179 (13.0)	1,934 (14.1)	96 (8.1)	64 (9.9)	85 (6.7)	<0.001
Other prehospital intervention[h]	575 (3.4)	434 (3.2)	46 (3.9)	34 (5.3)	61 (4.8)	0.001
Documented prehospital medication	2,754 (100.0)	2,320 (84.2)	94 (3.4)	129 (4.7)	211 (7.7)	
Analgesic, morphine	622 (22.6)	560 (24.1)	13 (13.8)	21 (16.3)	28 (13.3)	<0.001
Analgesic, fentanyl	377 (13.7)	325 (14)	6 (6.4)	19 (14.7)	27 (12.8)	0.195
Analgesic, ketamine	140 (5.1)	114 (4.9)	6 (6.4)	13 (10.1)	7 (3.3)	0.037
Analgesic, other	406 (14.7)	348 (15)	13 (13.8)	10 (7.8)	35 (16.6)	0.123
Antibiotic	406 (14.7)	333 (14.4)	23 (24.5)	17 (13.2)	33 (15.6)	0.052
Other or unknown medication	803 (29.2)	640 (27.6)	33 (35.1)	49 (38.0)	81 (38.4)	<0.001

[a]Non-U.S. military includes North Atlantic Treaty Organization (NATO) and Afghan forces.
[b]Prehospital combat mortality index was calculated using prehospital vital signs or initial vital signs upon presentation to Role 2.
[c]Other bleeding interventions include direct pressure, hemostatic dressing, field dressing, and other or unknown dressing.
[d]Airway interventions include prehospital airway, definitive airway, and airway adjuncts to assist respiration.
[e]Breathing interventions include needle decompression, chest seals and other occlusive dressings, and chest tubes.
[f]Circulation interventions include intravenous access, interosseous access, and cardiopulmonary resuscitation (CPR).
[g]Hypothermia interventions include blanket, body bag, hypothermia prevention management kit, space blanket, and other warming devices.
[h]Other prehospital interventions include splints, C-spine immobilization, and eye shields.

TABLE IV. Study Characteristics by Year for Trauma-Eligible Adult Patients (n = 10,559) Treated at Role 2 Medical Treatment Facilities During Afghanistan Conflict from February 2008 to September 2014

Category	All, No. (%)	Year, No. (%)							p-Value
		2008	2009	2010	2011	2012	2013	2014	
Patients	10,559 (100.0)	233 (2.2)	975 (9.2)	2,192 (20.8)	3,570 (33.8)	2,323 (22.0)	936 (8.9)	330 (3.1)	
Age, median (IQR), yr	25 (21–30)	25 (21–28)	25 (22–30)	24 (21–29)	25 (21–30)	25 (22–30)	25 (22–30)	25 (22–30)	0.010
Male	10,253 (97.1)	221 (94.8)	951 (97.5)	2,135 (97.4)	3,434 (96.2)	2,276 (98.0)	915 (97.8)	321 (97.3)	0.001
Battle injury	8,479 (80.3)	179 (76.8)	803 (82.4)	1,783 (81.3)	2,772 (77.6)	1,897 (81.7)	768 (82.1)	277 (83.9)	<0.001
Non-battle injury	2,080 (19.7)	54 (23.2)	172 (17.6)	409 (18.7)	798 (22.4)	426 (18.3)	168 (17.9)	53 (16.1)	<0.001
Patient affiliation									
Military, U.S.	3,914 (37.1)	64 (27.5)	473 (48.5)	964 (44.0)	1,305 (36.6)	730 (31.4)	311 (33.2)	67 (20.3)	<0.001
Military, non-U.S.[a]	4,244 (40.2)	121 (51.9)	308 (31.6)	761 (34.7)	1,357 (38.0)	1,005 (43.3)	484 (51.7)	208 (63.0)	<0.001
Civilian or unknown	2,401 (22.7)	48 (20.6)	194 (19.9)	467 (21.3)	908 (25.4)	588 (25.3)	141 (15.1)	55 (16.7)	<0.001
Transport type and mode, to Role 2									
Medical Evacuation, air	8,109 (76.8)	189 (81.1)	866 (88.8)	1,951 (89)	2,854 (79.9)	1,634 (70.3)	507 (54.2)	108 (32.7)	<0.001
Medical Evacuation, ground	1,137 (10.8)	31 (13.3)	108 (11.1)	223 (10.2)	388 (10.9)	233 (10.0)	123 (13.1)	31 (9.4)	0.127
Casualty Evacuation, air	296 (2.8)	0 (0.0)	0 (0.0)	0 (0.0)	69 (1.9)	136 (5.9)	59 (6.3)	32 (9.7)	<0.001
Casualty Evacuation, ground	1,017 (9.6)	13 (5.6)	1 (0.1)	18 (0.8)	259 (7.3)	320 (13.8)	247 (26.4)	159 (48.2)	<0.001
Transport time, injury to Role 2 arrival	5,575 (52.8)	92 (39.5)	455 (46.7)	1,078 (49.2)	1,700 (47.6)	1,437 (61.9)	534 (57.1)	279 (84.5)	
Time >60 min	3,189 (30.2)	63 (27.0)	264 (27.1)	637 (29.1)	1,012 (28.3)	745 (32.1)	301 (32.2)	167 (50.6)	<0.001
Time ≤60 min	2,386 (22.6)	29 (12.4)	191 (19.6)	441 (20.1)	688 (19.3)	692 (29.8)	233 (24.9)	112 (33.9)	<0.001
Elapsed time, median (IQR), min	75 (44–150)	83 (60, 124)	74 (45, 120)	76 (45, 153)	78 (45, 180)	64 (40, 126)	77 (41, 167)	86 (45, 179)	<0.001
Injury type	9,887 (93.6)	225 (96.6)	691 (70.9)	2,132 (97.3)	3,458 (96.9)	2,198 (94.6)	888 (94.9)	295 (89.4)	
Penetrating	5,644 (53.5)	141 (60.5)	335 (34.4)	1,133 (51.7)	1,962 (55.0)	1,313 (56.5)	551 (58.9)	209 (63.3)	<0.001
Blunt	3,248 (30.8)	44 (18.9)	269 (27.6)	732 (33.4)	1,225 (34.3)	669 (28.8)	249 (26.6)	60 (18.2)	<0.001
Penetrating and blunt	795 (7.5)	32 (13.7)	69 (7.1)	234 (10.7)	200 (5.6)	173 (7.4)	67 (7.2)	20 (6.1)	<0.001
Burn	200 (1.9)	8 (3.4)	18 (1.8)	33 (1.5)	71 (2.0)	43 (1.9)	21 (2.2)	6 (1.8)	0.471
Injury mechanism	9,930 (94.0)	219 (94.0)	722 (74.1)	2,145 (97.9)	3,366 (94.3)	2,277 (98.0)	878 (93.8)	323 (97.9)	
Explosion	5,101 (48.3)	107 (45.9)	381 (39.1)	1,143 (52.1)	1,727 (48.4)	1142 (49.2)	460 (49.1)	141 (42.7)	<0.001
Gunshot wound	2,600 (24.6)	69 (29.6)	152 (15.6)	502 (22.9)	866 (24.3)	629 (27.1)	254 (27.1)	128 (38.8)	<0.001
Motor vehicle crash	959 (9.1)	20 (8.6)	51 (5.2)	235 (10.7)	355 (9.9)	206 (8.9)	66 (7.1)	26 (7.9)	<0.001
Falls	379 (3.6)	8 (3.4)	42 (4.3)	95 (4.3)	132 (3.7)	62 (2.7)	32 (3.4)	8 (2.4)	0.058
Other	891 (8.4)	15 (6.4)	96 (9.8)	170 (7.8)	286 (8.0)	238 (10.2)	66 (7.1)	20 (6.1)	0.002
Combat mortality index – prehospital[b]	9,452 (89.5)	224 (96.1)	917 (94.1)	2,007 (91.6)	3,095 (86.7)	2,104 (90.6)	850 (90.8)	255 (77.3)	
0 Mild	5,881 (55.7)	143 (61.4)	569 (58.4)	1,245 (56.8)	1,966 (55.1)	1,342 (57.8)	497 (53.1)	119 (36.1)	<0.001
1 Moderate	2,465 (23.3)	49 (21.0)	265 (27.2)	546 (24.9)	771 (21.6)	511 (22.0)	234 (25.0)	89 (27.0)	0.001
2 Severe	631 (6.0)	17 (7.3)	49 (5.0)	130 (5.9)	205 (5.7)	144 (6.2)	60 (6.4)	26 (7.9)	0.507
3–4 Critical	475 (4.5)	15 (6.4)	34 (3.5)	86 (3.9)	153 (4.3)	107 (4.6)	59 (6.3)	21 (6.4)	0.012
Combat mortality index – in hospital	4,102 (38.8)	33 (14.2)	370 (37.9)	988 (45.1)	1,271 (35.6)	950 (40.9)	430 (45.9)	60 (18.2)	
0–1 Mild	2,789 (26.4)	13 (5.6)	264 (27.1)	699 (31.9)	911 (25.5)	626 (26.9)	250 (26.7)	26 (7.9)	<0.001
2–3 Moderate	928 (8.8)	13 (5.6)	72 (7.4)	214 (9.8)	265 (7.4)	225 (9.7)	126 (13.5)	13 (3.9)	<0.001
4–5 Severe	283 (2.7)	3 (1.3)	27 (2.8)	59 (2.7)	72 (2.0)	67 (2.9)	39 (4.2)	16 (4.8)	0.001
6–8 Critical	102 (1.0)	4 (1.7)	7 (0.7)	16 (0.7)	23 (0.6)	32 (1.4)	15 (1.6)	5 (1.5)	0.009
Mortality	470 (4.5)	5 (2.1)	32 (3.3)	79 (3.6)	171 (4.8)	122 (5.3)	46 (4.9)	15 (4.5)	

(continued)

TABLE IV. Continued

Category	All, No. (%)	Year, No. (%) 2008	2009	2010	2011	2012	2013	2014	*p*-Value
Died en route or dead on arrival	83 (0.8)	0 (0.0)	10 (1.0)	10 (0.5)	41 (1.1)	17 (0.7)	5 (0.5)	0 (0.0)	0.024
Died while at Role 2	387 (3.7)	5 (2.1)	22 (2.3)	69 (3.1)	130 (3.6)	105 (4.5)	41 (4.4)	15 (4.5)	0.016
Documented prehospital intervention	16,766 (100.0)	236 (1.4)	982 (5.9)	2,155 (12.9)	6,095 (36.4)	4,709 (28.1)	1,909 (11.4)	680 (4.1)	
Bleeding intervention, tourniquet	1,539 (9.2)	24 (10.2)	125 (12.7)	268 (12.4)	519 (8.5)	393 (8.3)	154 (8.1)	56 (8.2)	<0.001
Bleeding intervention, other[c]	3,422 (20.4)	0 (0.0)	0 (0.0)	3 (0.1)	1,270 (20.8)	1,336 (28.4)	561 (29.4)	252 (37.1)	<0.001
Airway intervention[d]	895 (5.3)	31 (13.1)	104 (10.6)	187 (8.7)	267 (4.4)	199 (4.2)	77 (4.0)	30 (4.4)	<0.001
Breathing intervention[e]	164 (1.0)	0 (0.0)	0 (0.0)	2 (0.1)	44 (0.7)	76 (1.6)	31 (1.6)	11 (1.6)	<0.001
Circulation intervention[f]	1,017 (6.1)	0 (0.0)	0 (0.0)	1 (0.0)	356 (5.8)	452 (9.6)	180 (9.4)	28 (4.1)	<0.001
Hypothermia intervention[g]	6,975 (41.6)	164 (69.5)	647 (65.9)	1,413 (65.6)	2,381 (39.1)	1,522 (32.3)	646 (33.8)	202 (29.7)	<0.001
Documentation, prehospital en route	2,179 (13.0)	17 (7.2)	106 (10.8)	279 (12.9)	1,043 (17.1)	524 (11.1)	130 (6.8)	80 (11.8)	<0.001
Other prehospital intervention[h]	575 (3.4)	0 (0.0)	0 (0.0)	2 (0.1)	215 (3.5)	207 (4.4)	130 (6.8)	21 (3.1)	<0.001
Documented prehospital medication	2,754 (100.0)	0 (0.0)	0 (0.0)	4 (0.1)	900 (32.7)	1,149 (41.7)	581 (21.1)	120 (4.4)	
Analgesic, morphine	622 (22.6)	0 (0.0)	0 (0.0)	1 (25.0)	282 (31.3)	227 (19.8)	94 (16.2)	18 (15.0)	<0.001
Analgesic, fentanyl	377 (13.7)	0 (0.0)	0 (0.0)	2 (50.0)	103 (11.4)	175 (15.2)	78 (13.4)	19 (15.8)	0.026
Analgesic, ketamine	140 (5.1)	0 (0.0)	0 (0.0)	0 (0.0)	7 (0.8)	41 (3.6)	80 (13.8)	12 (10.0)	<0.001
Analgesic, other	406 (14.7)	0 (0.0)	0 (0.0)	0 (0.0)	141 (15.7)	168 (14.6)	87 (15.0)	10 (8.3)	0.275
Antibiotic	406 (14.7)	0 (0.0)	0 (0.0)	0 (0.0)	140 (15.6)	170 (14.8)	81 (13.9)	15 (12.5)	0.854
Other or unknown medication	803 (29.2)	0 (0.0)	0 (0.0)	1 (25.0)	227 (25.2)	368 (32.0)	161 (27.7)	46 (38.3)	0.001

[a]Non-U.S. military includes North Atlantic Treaty Organization (NATO) and Afghan forces.
[b]Prehospital combat mortality index was calculated using prehospital vital signs or initial vital signs upon presentation to Role 2.
[c]Other bleeding interventions include direct pressure, hemostatic dressing, field dressing, and other or unknown dressing.
[d]Airway interventions include prehospital airway, definitive airway, and airway adjuncts to assist respiration.
[e]Breathing interventions include needle decompression, chest seals and other occlusive dressings, and chest tubes.
[f]Circulation interventions include intravenous access, interosseous access, and cardiopulmonary resuscitation (CPR).
[g]Hypothermia interventions include blanket, body bag, hypothermia prevention management kit, space blanket, and other warming devices.
[h]Other prehospital interventions include splints, C-spine immobilization, and eye shields.

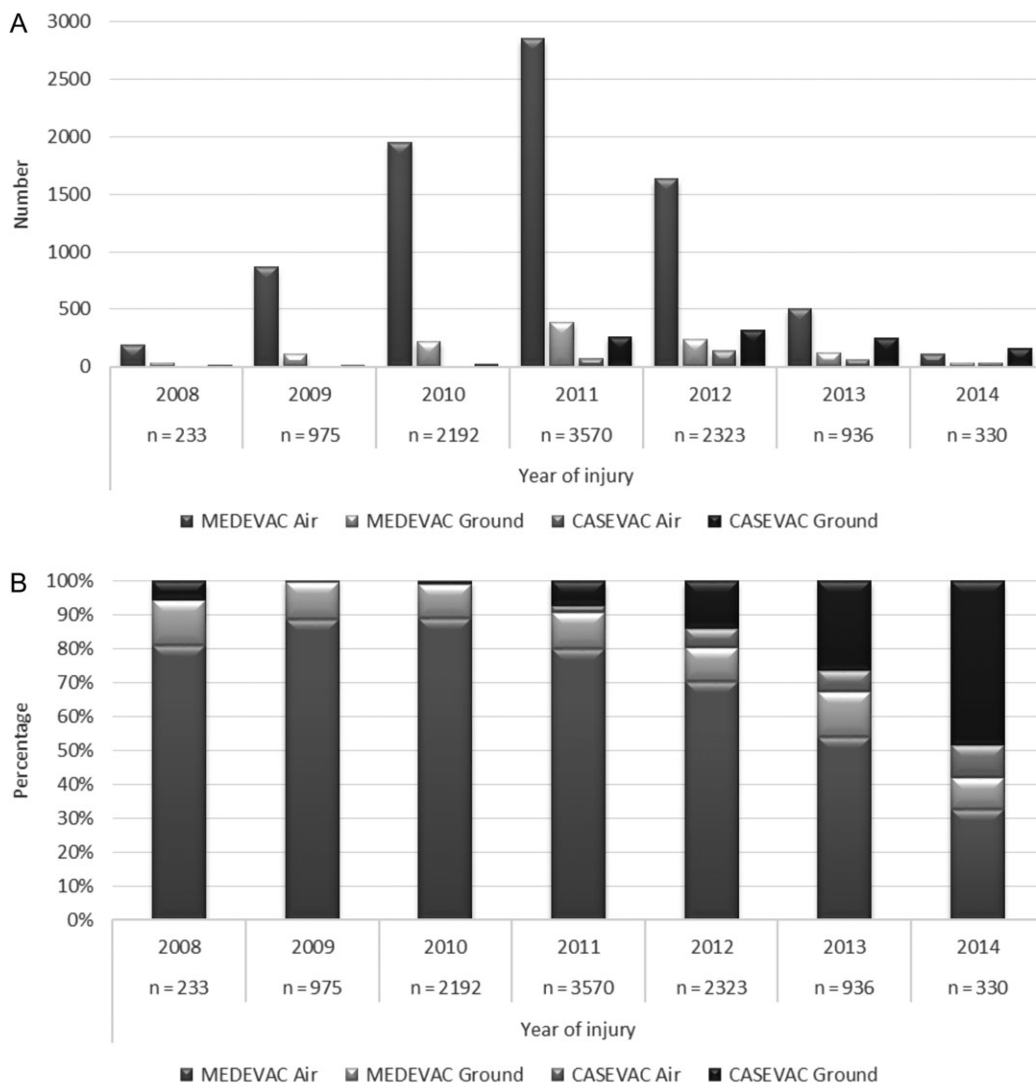

FIGURE 2. Number (A) and percentage (B) of transport type (Medical Evacuation [MEDEVAC], Casualty Evacuation [CASEVAC]) and mode (air, ground) for trauma-eligible adult patients (n = 10,559) treated at Role 2 medical treatment facilities during Afghanistan conflict by year, 2008–2014.

and the lowest percent of patients rated as moderate, severe, and critical. Non-U.S. military casualties had the highest percent rated by CMI-IH as critical. Differences for CMI-IH were also seen between transport type and mode groups (Table III) for mild and moderate categories with CASEVAC air transporting a lower percent of patients rated as mild and moderate.

The total study population mortality was 4.5% (470/10,559). For mortality during transport from Role 1 to Role 2, less than 1% of patients overall died en route or were dead on arrival (0.8%; 83/10,559). This was also consistent by patient affiliation (Table II) and by transport type and mode (Table III), but not by year (Table IV) as this percent was exceeded in 2011 (1.1%; 41/3,570). Also of note is that 82.0% (73/89) of casualties initially categorized as died en route or dead on arrival also had documented vital signs and/or attempted resuscitation through interventions, of which 8.2% (6/73) were successfully resuscitated and ultimately survived. For patients who died while at Role 2, 3.7% (387/10,559) died overall, a lower percent was seen in U.S. military (2.4%; 93/3,914) versus other patient affiliations (Table II), and a higher percent was seen following transport by CASEVAC air (7.1%; 21/296) versus other types and modes of transport (Table III).

Prehospital Interventions and Medications

Prehospital documentation was available for 20.6% (2,179/10,559) of the study sample, was most robust in the year 2011 (29.2%; 1,043/3,570) (Table IV), and occurred most frequently on MEDEVAC air (23.9%; 1,934/8,109) (Table III) and particularly for U.S. military casualties (21.8%; 855/3,914) (Table II). For documented prehospital interventions captured by this study, hypothermia interventions (41.6%; 6,975/16,766) were provided most frequently followed by bleeding interventions (29.6%; 4,961/16,766). By patient affiliation (Table II), non-U.S. military received the most interventions (43.3%;

7,268/16,766) and civilian or unknown the least (23.6%; 3,952/16,766). By transport type and mode (Table III), most interventions were provided to patients transported by MEDEVAC air (81.6%; 13,677/16,766) and the least to patients transported by CASEVAC Air (3.8%; 644/16,766). By year (Table IV), most interventions were provided to patients from 2011 to 2012 (64.4%; 10,804/16,766). For prehospital medications, analgesics (56.1%; 1,545/2,754) were administered most frequently, with morphine noted as the dominant analgesic used during en route care. By patient affiliation (Table II), most medications were administered to non-U.S. military patients (42.4%; 1,168/2,754) and the least to civilian or unknown (24.3%; 668/2,754). By transport type and mode (Table III), most medications were provided to patients transported by MEDEVAC air (84.2%; 2,320/2,754) and the least to patients transported by MEDEVAC ground (3.4%; 94/2,754). Documentation of prehospital medications became more common starting in the year 2011 (Table IV).

DISCUSSION

Understanding the epidemiology of battlefield prehospital trauma care and transport is a vital component of TCCC and trauma system performance improvement. The current descriptive study and analysis was undertaken to develop a better understanding of the TACEVAC phase of TCCC care that occurred for casualties transported to a Role 2 medical treatment facility during the Afghanistan conflict. Although tactical and environmental factors must also be considered, medically, the most efficient and effective means of transport for trauma casualties relies on the appropriate selection of type and mode of transport commensurate with accurate triage of injured patients, as under-triage can affect patient outcomes and over-triage can affect trauma system resources.

Several battlefield articles and studies of prehospital[1,20–27] and inter-hospital[28,29] patient transport, as well as Role 2 facilities,[30–37] have been published from the recent conflict in Afghanistan. This current article is unique in that it provides a comprehensive study of prehospital trauma patients by type and mode of transport from Role 1 to Role 2 entities in Afghanistan. For the casualties depicted in this study, the most common injury type was penetrating, and the dominant injury mechanism was explosion. The predominant type and mode of transport in this study was MEDEVAC air, which was also observed to have provided the most en route care through both prehospital interventions and medications. The most rapid transport time by type and mode of transport was CASEVAC air, which was also found to provide the least prehospital interventions and also ultimately demonstrated a higher percentage of casualties who died while at Role 2. By patient affiliation, U.S. military casualties received the most rapid transport time in spite of non-U.S. military casualties having a larger proportion of prehospital interventions and critical patients as documented by CMI-IH. However, as the majority (79.4%) of casualties in our study were missing prehospital documentation and associated data, we can only assume and not conclude with certainty these statements on prehospital interventions and medications.

The U.S. Army is the only service with designated and dedicated prehospital air evacuation capability. The other military services do not have dedicated prehospital transport and exclusively use designated or non-designated transport, the latter of which are platforms of opportunity. However, during the study time frame, the U.S. Air Force combat search and rescue aircraft and paramedics were redirected to assist the U.S. Army with its MEDEVAC mission, and thus, this group was categorized as MEDEVAC air for the purposes of this study. Otherwise, this analysis is hindered by the fact that it could not be determined what medical assets, if any, were aboard CASEVAC platforms. It is therefore possible that the higher CASEVAC mortality was due to patient movements with no medical care provided, despite more rapid transportation. The successful United Kingdom prehospital use of the Medical Evacuation Response Team in Afghanistan, which deployed a team of experienced providers (anesthesiologists or emergency medicine physicians, critical care or emergency medicine nurses, respiratory therapists, and paramedics) on armed utility helicopters, demonstrated survival benefit for critically injured casualties through advanced expertise and capability.[21,23] The U.S. Army use of critical care–trained flight paramedics in Afghanistan, versus basic emergency medical technicians, also demonstrated a survival benefit.[22] Both of these examples suggest that it is also medical capability and expertise, and not solely a rapid transportation platform, that is paramount to success.

As designated and dedicated U.S. Army MEDEVAC platforms have been and will remain a finite resource for worldwide efforts, CASEVAC platforms must continue to be ready to fill the gap for widely dispersed and austere military operations. The contingency use of CASEVAC, through mission aircraft and other readily available transport platforms of opportunity, can save time and therefore some lives; however, it should not come at a cost of other lives that could be saved through improved prehospital medical training and equipment among non-medical providers on unregulated platforms. Although CASEVAC air achieved the quickest transport times in our study, the higher mortality observed in casualties evacuated by this type and mode of transport supports the need to improve en route care on these platforms through TCCC training and equipment, particularly as these casualties were not noted to be sicker by CMI. It has been previously recommended that all personnel on the battlefield should receive training in TCCC.[38–42] This TCCC standard must occur on standard and non-standard evacuation platforms, and throughout air, ground, and water forces as future conflicts will not have the guarantee of air superiority, or the luxury of manageable areas of operations compared with theaters such as Africa and the Pacific, in which to achieve the "golden hour" trauma goal.

Review of the medical literature on patient evacuation is confounded by the use of terminology that is either not defined or contradictory within U.S. and NATO military doctrine. For example, although some authors refer to TACEVAC as prehospital patient movement from point of injury to a medical treatment facility, this conflicts with NATO doctrine (approved by the U.S.) that labels this patient movement as "forward evacuation," with TACEVAC defined as patient movement between medical treatment facilities within a given theater of operations.[43] Similarly, many authors refer to MEDEVAC as being dedicated evacuation platforms and CASEVAC as a lift or platform of opportunity, whereas U.S. military doctrine distinguishes the two by whether the patient movement is regulated (i.e., medical treatment facility destination is directed by a patient evacuation coordination cell).[17] This is also confounded by the U.S. Army being the only military service that has true dedicated MEDEVAC air capability, even though all services regulate patient movement. The U.S. Army generally uses dedicated and regulated MEDEVAC assets such as ground and air ambulances, whereas the U.S. Navy usually relies on non-dedicated, unregulated, and non-standardized platforms of opportunity. The U.S. Marine Corps has some dedicated ground transport assets and also relies on designated air and other platforms of opportunity. If U.S. Air Force assets are needed for transport of patients from Role 1 to Role 2, platforms of opportunity may be used. Although confusing, this is why definitions of MEDEVAC, CASEVAC, and TACEVAC had to be clearly defined for this analysis.

In addition to environmental factors (e.g., weather, illumination, altitude, and terrain) and the innate hazards of combat, patient hand offs, transfers, and transports are precarious transition periods for trauma patients, where documentation and communication of injuries and treatment are vital. In an effort to increase historically suboptimal prehospital documentation,[44] the Joint Trauma System has developed and implemented simple and functional prehospital documentation and registry tools in order to facilitate the capture of data from the tactical field care and TACEVAC phases of care.[25,45–48]

Medical regulation and intelligent tasking of patient transport assets require accurate and real-time clinical information in order to coordinate appropriate type and mode of transport, destination treatment facility, and ultimately improve patient outcomes. Collectively, clinical information at and between roles of care is required for performance improvement of military trauma systems. Although significant advances were made during the Afghanistan conflict, data capture has been most robust at Role 3 and Role 4 medical treatment facilities, where scanned and electronic medical records can be readily transmitted. The closer one gets to the point of injury, the less clinical information is captured. This is due to lack of time before prehospital evacuation, fragmented ownership and decision-making for prehospital initiatives, and problems with resources, interoperability, and connectivity at Role 1 and Role 2.

The Role 1 prehospital trauma registry and the Role 2 registry were therefore implemented by the JTS as standalone software programs to allow combat casualty care data capture by the individual forward units. These registries therefore rely on the willingness and compliance of individual units to use the registry (e.g., volunteer versus mandate), their dedication and consistent and continuous use of the registry (e.g., personality-based versus systems-based, an additional task to conduct if time is available versus an integral part of their expected duties), and how they choose to enter the data (e.g., standard data fields versus free text entries). Thus, by the intrinsic nature of these registries, data may be very complete, incomplete, or nonexistent depending on individuals and location. Therefore, data from the Role 2 registry are not necessarily representative and inclusive of all combat casualty care experiences and data at these roles of care. Additionally, patients who died during transport may not have been entered into the Role 2 registry, as criteria for entry was treatment at a Role 2 facility. Furthermore, limited Role 2 registry data were validated against source medical records at the time data were pulled for this study. Regardless of these identified limitations and shortfalls, these data are the best available source of information for this type of study population at the present time.

Established in 2001, the Committee on TCCC has since facilitated a revolution in prehospital combat casualty care.[41,49] With the establishment of the Committee on En Route Combat Casualty Care in 2016, the potential exists to do the same for battlefield care administered during all types and modes of patient transport. As both of these committees reside within the Department of Defense Joint Trauma System, they have the potential to work synergistically to improve policy, doctrine, and requirements; develop and standardize evidence-based best-practice clinical guidelines and commensurate combat-related techniques, tactics, and procedures; improve documentation and data collection practices; shape and influence training based on tasks, conditions, and standards; and ultimately reduce morbidity and mortality on the battlefield through seamless practices and joint service efforts.

Although previous combat casualty care statistics and preventable death studies have demonstrated that the majority of deaths occur in the prehospital versus hospital environment,[50–55] future preventable death studies must also distinguish preventable deaths at each role of care and each type and mode of patient transport in order to better direct performance improvement and research in appropriate areas. Currently, the critical area for performance improvement and research remains Role 1, the prehospital period before and during transport to surgical care. Continued migration of damage control resuscitation capability, such as whole blood and blood products,[56–58] closer to the point of injury have great potential to eliminate preventable death. Future research must also focus on innovative methods to advance pre-surgical care on the battlefield through prehospital internal or non-compressible hemorrhage control, evaluation and treatment of intracranial bleeding, and prevention and management of shock.

CONCLUSIONS

Role 2 medical treatment facilities in Afghanistan received a diverse population of casualties that arrived by various types and modes of transport. The majority of patients in this analysis were transported by MEDEVAC air. The shortest time for transport but higher mortality was seen with CASEVAC air. Although less data were available for CASEVAC air, this rapid mode of transport remains an operationally critical method of battlefield patient evacuation. This analysis underscores the need to improve prehospital data capture, particularly from combat missions that utilize primary or contingency platforms of opportunity for TACEVAC. Findings also support the continued and steadfast emphasis on TCCC training and standardization for non-medical and medical personnel providing en route care, particularly during CASEVAC air.

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PRESENTATIONS

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CONFLICT OF INTEREST

The authors have no financial interests that warrant disclosure.

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A US military Role 2 forward surgical team database study of combat mortality in Afghanistan

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BACKGROUND: Timely and optimal care can reduce mortality among critically injured combat casualties. US military Role 2 surgical teams were deployed to forward positions in Afghanistan on behalf of the battlefield trauma system. They received prehospital casualties, provided early damage control resuscitation and surgery, and rapidly transferred casualties to Role 3 hospitals for definitive care. A database was developed to capture Role 2 data.

METHODS: A retrospective review and descriptive analysis were conducted of battle-injured casualties transported to US Role 2 surgical facilities in Afghanistan from February 2008 to September 2014. Casualties were analyzed by mortality status and location of death (pretransport, intratransport, or posttransport), military affiliation, transport time, injury type and mechanism, combat mortality index–prehospital (CMI-PH), and documented prehospital treatment.

RESULTS: Of 9,557 casualties (median age, 25.0 years; male, 97.4%), most (95.1%) survived to transfer from Role 2 facility care. Military affiliation included US coalition forces (37.4%), Afghanistan National Security Forces (23.8%), civilian/other forces (21.3%), Afghanistan National Police (13.5%), and non-US coalition forces (4.0%). Mortality differed by military affiliation ($p < 0.001$). Among fatalities, most were Afghanistan National Security Forces (30.5%) civilian/other forces (26.0%), or US coalition forces (25.2%). Of those categorized by CMI-PH, 40.0% of critical, 11.2% of severe, 0.8% of moderate, and less than 0.1% of mild casualties died. Most fatalities with CMI-PH were categorized as critical (66.3%) or severe (25.9%), whereas most who lived were mild (56.9%) or moderate (25.4%). Of all fatalities, 14.0% died prehospital (pretransport, 5.8%; intratransport, 8.2%), and 86.0% died at a Role 2 facility (posttransport). Of fatalities with documented transport times (median, 53.0 minutes), most (61.7%) were evacuated within 60 minutes.

CONCLUSIONS: Role 2 surgical team care has been an important early component of the battlefield trauma system in Afghanistan. Combat casualty care must be documented, collected, and analyzed for outcomes and trends to improve performance. (*J Trauma Acute Care Surg.* 2018;85: 603–612. Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.)

LEVEL OF EVIDENCE: Therapeutic/Care Management, level IV.

KEY WORDS: Afghanistan; combat casualty care; mortality; role 2 forward surgical team; trauma.

The United States and other North Atlantic Treaty Organization countries have structured their military trauma systems into four "roles" of care that depict a continuum of increasing capability with each higher role number.[1–3] At Role 2 facilities, damage control resuscitation and surgery provided by forward surgical teams can bridge the time, space, and capability gap between Role 1 prehospital care provided at or near the point of wounding and Role 3 and Role 4 medical treatment facilities that have more robust hospital, intensive, and definitive care as well as holding capacity.

The survival of critically injured combat casualties is contingent upon timely delivery of optimal care.[4–8] Although a recent topic of debate,[9,10] it was with the premise that critically injured casualties would benefit from reduced time between injury and surgical care that forward-positioned surgical teams were deployed and utilized on the battlefield of Afghanistan.[11–14] Time to surgical capability was further reduced with the increase in number and dispersion of these surgical teams across the battlefield and with a mandate for reducing the time of prehospital transport of critically injured combat casualties to 60 minutes or less.[4]

Despite challenges innate to small, mobile Role 2 surgical facilities with limited personnel and resources, mortality outcomes measured through died-of-wound rates were previously found to be no different when compared with Role 3 surgical facilities for combat casualties during the conflict in Iraq.[14] Although a comprehensive study of combat casualties in Afghanistan did find died-of-wounds mortality to be higher for critically injured

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casualties initially treated at Role 2 versus Role 3 facilities,[4] a follow-on analysis of the same data demonstrated that casualties first delivered to a Role 2 facility had lower odds of killed-in-action mortality compared with those first delivered to a Role 3 facility.[6] Although strategic, operational, and tactical differences between the conflicts in Afghanistan and Iraq shaped and impacted respective trauma systems and outcomes within those countries,[15] all these studies highlight a need for additional detailed study and analysis of mortality outcome by evacuation time, prehospital interventions, and role of care.

In addition to analyzing trauma system data in its entirety, data pertaining specifically to each component of trauma care delivery at and between roles of care are essential to military trauma system performance improvement. Although significant advances in documentation and data collection were made during the conflict in Afghanistan, data capture was most robust at Role 3 and Role 4 facilities, where personnel, automation, and other resources were more abundant and tasked to facilitate such activities. However, working within the construct of a resource-constrained environment, documentation tools and a Role 2 database were developed by the US Department of Defense Joint Trauma System to aggregate data from Role 2 surgical facilities in order to inform leaders and gain insight on casualties, trauma care delivery, and morbidity and mortality outcomes.[16–18] Using data from the Role 2 database, the primary outcomes measured and purpose of this current study were to compare casualties by mortality status (lived vs. died) and evaluate fatalities by location of death (pretransport, intratransport, or posttransport to Role 2 facilities) and military affiliation and secondarily to further examine US fatalities by injury severity and body region injured.

METHODS

A review and data analysis were conducted using the Department of Defense Joint Trauma System Role 2 Database. This database collected patient data (i.e., diagnosis, Role 1 and 2 treatment, and outcomes) from clinical providers at Role 2 facilities. Adult (≥18 years) trauma patients were eligible for study if a battle injury was incurred during the Afghanistan conflict from February 2008 to September 2014. Patients were excluded from study if they had an unknown discharge status or were categorized with a nonbattle injury. This study was reviewed and approved by the US Army Institute of Surgical Research regulatory department and was determined to be exempt.

Patients were classified by demographic characteristics. Military affiliation included US coalition forces, non-US coalition forces, Afghanistan National Security Forces (ANSF), Afghanistan National Police, and civilian or other forces, where other forces included patients from an undisclosed nation who were engaged in fighting but were not a prisoner of war.

A dominant injury type was assigned for each patient among four categories: penetrating, blunt, penetrating and blunt, and burn. If a patient incurred multiple injury types to include burn, the dominant injury type was categorized as burn. A dominant mechanism of injury was assigned for each patient among four categories: explosion, gunshot wound, motor vehicle crash, and other (e.g., falls). If circumstances indicated multiple mechanisms of injury to include explosion, the dominant mechanism of injury was categorized as explosion.

As traditional hospital documentation practices were not mandated and enforced for Role 2 facilities, injury severity scores were not assessed. Thus, no specific injury severity score data were available in the Role 2 database. However, as a surrogate, the combat mortality index–prehospital (CMI-PH) as developed by Le and colleagues[19] at the US Army Institute of Surgical Research was used as a measure of physiological trauma injury severity as well as a predictor of mortality among battlefield casualties. The CMI-PH was calculated using Role 1 and Role 2 admission vital signs (i.e., heart rate [HR], systolic blood pressure, and Glasgow Coma Scale [GCS] score). The CMI-PH was calculated using the following equation: CMI-PH = HR + SBP + GCS-total, where HR equals 0 if patient HR was 60 to 100 beats/min or 1 if patient HR was less than 60 or greater than 100 beats/min; systolic blood pressure (SBP) equals 0 if patient SBP was 100 mm Hg or greater or 1 if patient SBP was less than 100 mm Hg; and GCS-total equals 0 if patient GCS-total was 14 or greater, 1 if patient GCS-total was 9 to 13, or 2 if patient GCS-total was 3 to 8. A CMI-PH score of 0 was categorized as mild, 1 as moderate, 2 as severe, and 3 or 4 as critical.

Additionally, US coalition force fatality data were matched to the Armed Forces Medical Examiner System database to further evaluate these casualties by maximum Abbreviated Injury Scale (mAIS) score and New Injury Severity Score (NISS). The mAIS is the highest injury severity code assigned to a patient (range, 1–6). Patients may have multiple distinct injuries coded equally as highest in the same body region and/or different body regions. The NISS is the sum of the squares of the top three injuries with the highest injury severity codes regardless of body region (range, 1–75). If a patient has an injury with an mAIS of 6, the NISS is automatically a 75. The primary injured body region was determined by where the mAIS occurred. If the mAIS occurred in more than one primary injured body region, this was noted.

Locations of death were pretransport, intratransport, or posttransport to Role 2 facilities. As locations of death were not explicitly documented in the patient record, they were ascertained using other documented parameters. Pretransport death included patients whose record indicated that the patient died in the field prior to transport and/or received no en route care coupled with lack of documented vital signs. Intratransport death included patients who were determined to be alive when placed on a transport platform, had recorded vital signs or en route care, but died prior to arrival or were designated as dead on arrival to a Role 2 facility. Posttransport death included patients who were alive at time of Role 2 facility arrival but died prior to Role 2 transfer. Patients were determined to be alive at arrival if they had any documented vital signs depicting life, if the patient record had any comment indicating signs of life, or if the patient received treatment at a Role 2 facility. Heroic resuscitative efforts and diagnostic interventions (e.g., cardiopulmonary resuscitation, endotracheal tube, central line placement, focused abdominal sonography for trauma, abdominal wound exploration) were not used as evidence for proof of life.

Prehospital interventions included those used for hemorrhage control (e.g., tourniquet, pressure dressing, hemostatic dressing), airway (e.g., nasopharyngeal airway, cricothyroidotomy, oral or nasal intubation), breathing (e.g., needle decompression, chest tubes, chest seals and other occlusive dressings, bag-valve mask or tube ventilation), circulation (e.g., intravenous or intraosseous access, parenteral fluids and blood, cardiopulmonary resuscitation), hypothermia (e.g., blanket, hypothermia prevention management kit, space blanket), and other care (e.g., splints, cervical spine immobilization, eye shields).

Descriptive statistics were used to analyze casualties by mortality status (lived vs. died) and location of death (pretransport, intratransport, or posttransport) and fatalities by military affiliation. Other characteristics evaluated included demographics, transport time, time at Role 2 facility, injury type, injury mechanism, CMI-PH, prehospital intervention, and prehospital medication. Additional US coalition force fatality characteristics included mAIS, NISS, and primary injured body region. A χ^2 or analysis of variance was used to determine significant differences as appropriate. Because of the small sample size of some categories, comparisons included (1) all patients who died versus patients who lived and (2) US coalition forces versus all other patients. Analyses were performed using SAS, version 9.4 (SAS Institute, Inc., Cary, NC).

RESULTS

Of 15,310 patient records available for review, 12,780 patients had potential for further study based on country, age, traumatic injury, and date range criteria (Fig. 1). An additional 428 patients were excluded because of “unknown” discharge status or misclassification, and 2,795 patients were excluded because of nonbattle injury. Of the remaining 9,557 patients available for final analysis, 9,092 lived and 465 died before or during treatment at Role 2 facilities. Characteristics are provided for all casualties by mortality status and location of death (Table 1) and for fatalities by military affiliation (Table 2). The study population had a median age of 25.0 years (interquartile range [IQR], 21.0–30.0 years) and was primarily male (97.4%; 9,308/9,557), and most (95.1% [9,092/9,557]) survived to transfer from Role 2 facility care.

Military Affiliation

The distribution of casualties by military affiliation included US coalition forces (37.4% [3,578/9,557]), ANSF (23.8% [2,271/9,557]), civilian/other forces (21.3% [2,034/9,557]), Afghanistan National Police (13.5% [1,290/9,557]), and non-US coalition forces (4.0% [384/9,557]). Mortality differed by military affiliation ($p < 0.001$), with most fatalities categorized as either ANSF (30.5% [142/465]), civilian/other forces (26.0% [121/465]), or US coalition forces (25.2% [117/465]).

Transport Time and Time at Role 2 Facility

Of the 53.6% (5,122/9,557) of the study population with a documented interval transport time from injury to Role 2 arrival, 56.9% (2,916/5,122) had a time that was greater than 60 minutes, and 43.1% (2,206/5,122) had a time that was 60 minutes or less. The total population median transport time was 75.0 minutes (IQR, 45.0–157.5 minutes), and the median time of stay at a Role 2 facility was 3.0 hours (IQR, 1.25–5.93 hours). Of the

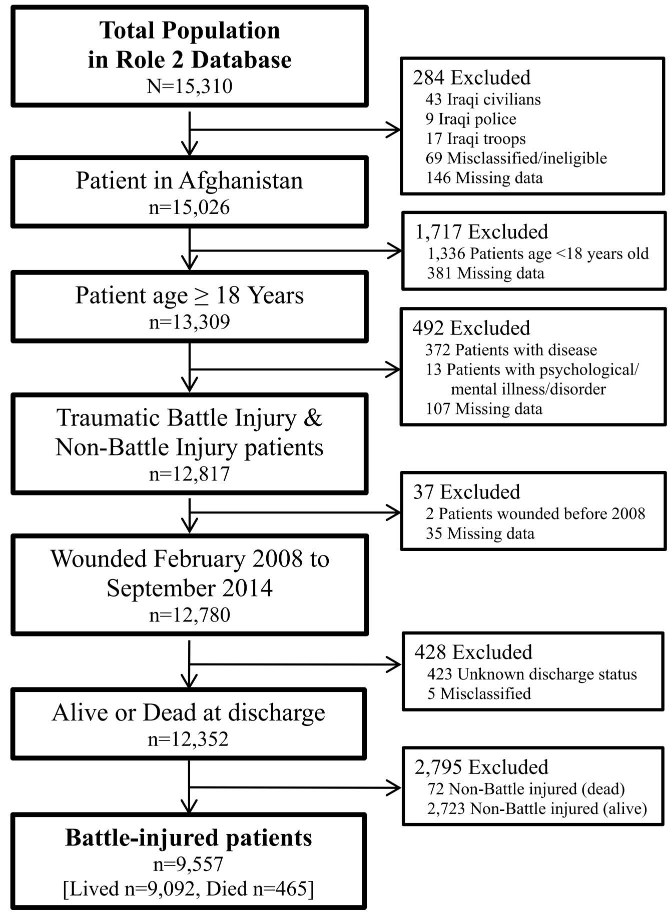

Figure 1. Study sample (n = 9,557) from Role 2 database maintained by the Department of Defense Joint Trauma System by inclusion and exclusion criteria.

39.4% (183/465) of fatalities with documented transport times (median [IQR], 53.0 minutes [30.0–80.5 minutes]), most (61.7% [113/183]) were evacuated within 60 minutes, and the median time at a Role 2 facility was 1.0 hours (IQR, 0.20–1.99 hours). Documented times from point of injury to death were available for 32.3% (150/465) of fatalities, with a median time of 1.69 hours (IQR, 0.88–3.28 hours).

Injury Type and Mechanism

Penetrating injury was the most frequently observed injury type in both those who lived (60.8% [5,524/9,092]) and died (75.9% [353/465]). Explosion was the most frequently observed mechanism of injury in both those who lived (58.8% [5,349/9,092]) and died (50.1% [233/465]). A greater proportion of gunshot wounds were seen among fatalities (lived 27.8% [2,531/9,092] vs. died 41.7% [194/465]) when compared with explosion (lived 58.8% [5,349/9,092] vs. died 50.1% [233/465]), motor vehicle crash (lived 2.0% [183/9,092] vs. died 2.4% [11/465]), and other mechanisms (lived 5.9% [538/9,092] vs. died 1.7% [8/465]). Thus, lethality was greatest for gunshot wounds (7.1% [194/2,725]), followed by motor vehicle crash (5.7% [11/194]), explosion (4.2% [233/5,349]), and other (1.5% [8/546]).

TABLE 1. Study Characteristics by Mortality Status of Casualties (n = 9,557) Injured in Battle During Afghanistan Conflict From February 2008 to September 2014

			Died								
	Total		Pretransport		Intratransport		Posttransport		Lived		
Table 1	n	%	n	%	n	%	n	%	n	%	p*
Casualties	9,557	100.0	27	0.3	38	0.4	400	4.2	9,092	95.1	
Age, median (IQR), y	25.0	21.0, 30.0	28.0	21.0, 34.0	25.0	21.0, 30.0	25.0	21.0, 30.0	25.0	22.0, 30.0	0.717
Male	9,308	97.4	25	92.6	36	94.7	388	97.0	8,859	97.4	0.832
Military affiliation											<0.001
Coalition, US	3,578	37.4	15	55.6	8	21.1	94	23.5	3,461	38.1	
Coalition, non-US	384	4.0	1	3.7	2	5.3	10	2.5	371	4.1	
ANSF	2,271	23.8	5	18.5	12	31.6	125	31.3	2,129	23.4	
Afghanistan National Police	1,290	13.5	0	0.0	7	18.4	65	16.3	1,218	13.4	
Civilian/other forces	2,034	21.3	6	22.2	9	23.7	106	26.5	1,913	21.0	
Transport time, injury to Role 2 arrival	5,122	53.6	15	55.6	12	31.6	156	39.0	4,939	54.3	<0.001
Time ≤60 min	2,206	23.1	8	29.6	8	21.1	97	24.3	2,093	23.0	
Time >60 min	2,916	30.5	7	25.9	4	10.5	59	14.8	2,846	31.3	
Transport time, median (IQR), min	75.0	45.0, 157.5	60.0	36.0, 100.0	58.0	35.0, 110.0	50.0	30.0, 80.0	78.0	45.0, 165.0	0.204
Time at Role 2, median (IQR), h	3.00	1.25, 5.93	0.00	0.03, 0.53	0.00	0.03, 0.33	1.00	0.25, 2.22	3.00	1.33, 6.17	0.136
Injury type	9,045	94.6	27	100.0	36	94.7	395	98.8	8,587	94.4	<0.001
Penetrating	5,877	61.5	16	59.3	27	71.1	310	77.5	5,524	60.8	
Blunt	2,279	23.9	5	18.5	1	2.6	31	7.8	2,242	24.7	
Penetrating and blunt	740	7.7	6	22.2	7	18.4	41	10.3	686	7.6	
Burn	149	1.6	0	0.0	1	2.6	13	3.3	135	1.5	
Injury mechanism	9,047	94.7	26	96.3	35	92.1	385	96.3	8,601	94.6	<0.001
Explosion	5,582	58.4	13	48.2	17	44.7	203	50.8	5,349	58.8	
Gunshot wound	2,725	28.5	11	40.7	18	47.4	165	41.3	2,531	27.8	
Motor vehicle crash	194	2.0	2	7.4	0	0.0	9	2.3	183	2.0	
Other	546	5.7	0	0.0	0	0.0	8	2.0	538	5.9	
Combat Mortality Index–Prehospital	8,510	89.0	3	11.1	14	36.8	238	59.5	8,255	90.8	<0.001
Mild	5,172	54.1	0	0.0	0	0.0	2	0.5	5,170	56.9	
Moderate	2,326	24.3	0	0.0	0	0.0	18	4.5	2,308	25.4	
Severe	590	6.2	0	0.0	0	0.0	66	16.5	524	5.8	
Critical	422	4.4	3	11.1	14	36.8	152	38.0	253	2.8	
Documented prehospital intervention	13,398	100.0	10	0.1	81	0.6	969	7.2	12,338	92.1	
Bleeding intervention, tourniquet	1,532	11.4	6	60.0	8	9.9	109	11.2	1,409	11.4	0.960
Bleeding intervention, other	2,807	21.0	0	0.0	14	17.3	171	17.6	2,622	21.3	0.0010
Airway intervention	834	6.2	0	0.0	21	25.9	208	21.5	605	4.9	<0.001
Breathing intervention	161	1.2	0	0.0	1	1.2	26	2.7	134	1.1	<0.001
Circulation intervention	1,651	12.3	0	0.0	13	16.0	164	16.9	1,474	11.9	<0.001
Fluids	673	5.0	0	0.0	0	0.0	29	3.0	644	5.2	<0.001
Blood	80	0.6	0	0.0	0	0.0	6	0.6	74	0.6	1.000
Hypothermia intervention	5,984	44.7	4	40.0	22	27.2	277	28.6	5,681	46.0	<0.001
Other prehospital intervention	429	3.2	0	0.0	2	2.5	14	1.4	413	3.3	<0.001
Documented prehospital medication	2,348	100.0	0	0.0	1	<0.1	70	3.0	2,277	97.0	
Analgesics	1,297	55.2	0	0.0	0	0.0	31	44.3	1,266	55.6	0.052
Fentanyl	338	14.4	0	0.0	0	0.0	10	14.3	328	14.4	1.000
Ketamine	125	5.3	0	0.0	0	0.0	6	8.6	119	5.2	0.273
Morphine	534	22.7	0	0.0	0	0.0	5	7.1	529	23.2	0.001
Other	300	12.8	0	0.0	0	0.0	10	14.3	290	12.7	0.718
Antibiotics	382	16.3	0	0.0	0	0.0	6	8.6	376	16.5	0.073
Other or unknown medication	669	28.5	0	0.0	1	100.0	33	47.1	635	27.9	<0.001

*Comparison is between all patients who died and patients who lived.

TABLE 2. Study Characteristics by Military Affiliation for Battle-Injured Fatalities (n = 465) Who Died Before or During Treatment at Role 2 Surgical Facilities During Afghanistan Conflict From February 2008 to September 2014

	Total		Coalition Forces: US		Coalition Forces: Non-US		ANSF		Afghanistan National Police		Civilian/Other Forces		
	n	%	n	%	n	%	n	%	n	%	n	%	p*
Fatalities	465	100.0	117	25.2	13	2.8	142	30.5	72	15.5	121	26.0	
Age, median (IQR), y	25.0	21.0, 30.0	24.0	21.0, 28.0	26.0	24.0, 29.0	24.0	21.0, 28.0	25.0	23, 30.0	25.0	21.0, 35.0	<0.001
Male	449	96.6	117	100.0	13	100.0	139	97.9	70	97.2	110	90.9	0.076
Mortality location													<0.001
Posttransport	400	86.0	94	80.3	10	76.9	125	88.0	65	90.3	106	87.6	
Intratransport	38	8.2	8	6.8	2	15.4	12	8.5	7	9.7	9	7.4	
Pretransport	27	5.8	15	12.8	1	7.7	5	3.5	0	0.0	6	5.0	
Transport time, injury to Role 2 arrival	183	39.4	52	44.4	8	61.5	45	31.7	32	44.4	46	38.0	0.099
Time ≤60 min	113	24.3	37	31.6	6	46.2	26	18.3	18	25.0	26	21.5	
Time >60 min	70	15.1	15	12.8	2	15.4	19	13.4	14	19.4	20	16.5	
Transport time, median (IQR), min	53.0	30.0, 80.5	43.0	25.0, 80.0	56.0	42.5, 74.0	41.0	27.0, 96.0	60.0	35.0, 106	58	45.0, 75.0	0.663
Time at Role 2, median (IQR), h	1.00	0.20, 1.99	0.00	0.19, 0.85	1.00	0.13, 1.05	1.00	0.18, 1.92	2.00	0.23, 3.72	1.00	0.32, 2.22	0.794
Time from injury to death	150	32.3	35	29.9	7	53.8	38	26.8	28	38.9	42	34.7	
Injury to death, median (IQR), h	1.69	0.88, 3.28	1.27	0.72, 2.98	1.28	0.75, 1.70	1.75	0.92, 3.37	2.92	1.16, 5.85	1.69	0.87, 2.65	
Injury type	458	98.5	116	99.1	13	100.0	140	98.6	70	97.2	119	98.3	0.372
Penetrating	353	75.9	86	73.5	10	76.9	107	75.4	54	75.0	96	79.3	
Blunt	37	8.0	13	11.1	2	15.4	10	7.0	4	5.6	8	6.6	
Penetrating and blunt	54	11.6	15	12.8	1	7.7	17	12.0	9	12.5	12	9.9	
Burn	14	3.0	2	1.7	0	0.0	6	4.2	3	4.2	3	2.5	
Injury mechanism	446	95.9	115	98.3	12	92.3	137	96.5	69	95.8	113	93.4	0.551
Explosion	233	50.1	65	55.6	8	61.5	68	47.9	38	52.8	54	44.6	
Gunshot wound	194	41.7	44	37.6	4	30.8	66	46.5	28	38.9	52	43.0	
Motor vehicle crash	11	2.4	3	2.6	0	0.0	2	1.4	2	2.8	4	3.3	
Other	8	1.7	3	2.6	0	0.0	1	0.7	1	1.4	3	2.5	
Combat Mortality Index–Prehospital	255	54.8	52	44.4	3	23.1	85	59.9	47	65.3	68	56.2	<0.001
Mild	2	0.4	0	0.0	0	0.0	1	0.7	0	0.0	1	0.8	
Moderate	18	3.9	0	0.0	0	0.0	7	4.9	5	6.9	6	5.0	
Severe	66	14.2	2	1.7	1	7.7	26	18.3	13	18.1	24	19.8	
Critical	169	36.3	50	42.7	2	15.4	51	35.9	29	40.3	37	30.6	
Documented prehospital intervention	1,025	100.0	278	27.1	43	4.2	318	31.0	183	17.9	203	19.8	
Bleeding intervention, tourniquet	123	12.0	42	15.1	6	14.0	30	9.4	18	9.8	27	13.3	0.066
Bleeding intervention, other	185	18.0	35	12.6	11	25.6	64	20.1	38	20.8	37	18.2	0.006
Airway intervention	229	22.3	69	24.8	8	18.6	63	19.8	50	27.3	39	19.2	0.273
Breathing intervention	27	2.6	7	2.5	0	0.0	11	3.5	4	2.2	5	2.5	1.000
Circulation intervention	142	13.9	49	17.6	6	14.0	45	14.2	22	12.0	20	9.9	0.042
Fluids	29	2.8	4	1.4	0	0.0	10	3.1	6	3.3	9	4.4	0.137
Blood	6	0.6	0	0.0	0	0.0	2	0.6	1	0.5	3	1.5	0.198

Continued next page

TABLE 2. *(Continued)*

	Total		Coalition Forces: US		Coalition Forces: Non-US		ANSF		Afghanistan National Police		Civilian/Other Forces		
	n	%	n	%	n	%	n	%	n	%	n	%	p*
Hypothermia intervention	303	29.6	73	26.3	12	27.9	101	31.8	47	25.7	70	34.5	0.166
Other prehospital intervention	16	1.6	3	1.1	0	0.0	4	1.3	4	2.2	5	2.5	0.578
Documented prehospital medication	71	100.0	6	8.5	1	1.4	40	56.3	14	19.7	10	14.1	
Analgesics	31	43.7	3	50.0	1	100.0	15	37.5	3	21.4	5	50.0	0.679
Fentanyl	10	14.1	1	16.7	0	0.0	5	12.5	1	7.1	3	30.0	1.000
Ketamine	6	8.5	1	16.7	0	0.0	4	10.0	0	0.0	0	0.0	0.384
Morphine	5	7.0	1	16.7	0	0.0	0	0.0	0	0.0	1	10.0	0.172
Other	10	14.1	0	0.0	1	100.0	6	15.0	2	14.3	1	10.0	0.580
Antibiotics	6	8.5	0	0.0	0	0.0	4	10.0	1	7.1	1	10.0	1.000
Other or unknown medication	34	47.9	3	50.0	0	0.0	18	45.0	9	64.3	4	40.0	1.000

*Comparison is between US coalition force patients and all other patients.

Combat Mortality Index and Location of Death

From the total study population, 89.0% (8,510/9,557) had sufficient data needed to evaluate injury severity by CMI-PH. As categorized by CMI-PH, 40.0% (169/422) of critical, 11.2% (66/590) of severe, 0.8% (18/2,326) of moderate, and less than 0.1% (2/5,172) of mild casualties died. Most fatalities with CMI-PH were categorized as critical (66.3% [169/255]) or severe (25.9% [66/255]), whereas most who lived were mild (56.9% [5,170/8,255]) or moderate (25.4% [2,308/8,255]).

Of all fatalities, 14.0% (65/465) died prehospital (pretransport 5.8% [27/465]; intratransport 8.2% [38/465]), and 86.0% (400/465) died at a Role 2 facility (posttransport). Subtracting the 65 prehospital deaths from the total study population of 9,557 battle-injured casualties provided a remaining casualty population of 9,492 who received treatment at a Role 2 facility. As 400 of these casualties died, the percentage died of wounds (%DOW) at Role 2 facilities in this study population was equal to 4.2% ([400/9,492] $\times$ 100).

Prehospital Interventions and Medications

All documented prehospital interventions, except tourniquets and blood, differed between those who lived and those who died. When comparing those who lived with those who died, a larger proportion of casualties who lived received more other bleeding interventions (21.3% [2,622/12,338] vs. 18.0% [185/1,025]; $p < 0.001$) and hypothermia interventions (46.0% [5,681/12,338] vs. 29.6% [303/1,025]; $p < 0.001$). Additionally, a smaller proportion of casualties who lived received more airway (4.9% [605/12,338] vs. 22.3% [229/1,025]; $p < 0.001$), breathing (1.1% [134/12,338] vs. 2.6% [27/1,025]; $p < 0.001$), and circulation (11.9% [1,474/12,338] vs. 13.9% [142/1,025]; $p < 0.001$) interventions. For documented medications administered, a larger proportion of casualties who lived received more morphine (23.2% [529/2,277] vs. 7.0% [5/71]; $p = 0.001$), whereas other or unknown medications were provided in greater proportion to casualties who died (27.9% [635/2,277] vs. 47.9% [34/71]; $p < 0.001$).

US Coalition Force Fatalities

All 117 US coalition force fatalities captured by this study were matched to the Armed Forces Medical Examiner System database. Characteristics for these fatalities by primary injured body regions (Table 3 and Fig. 2) include a median NISS of 50.0 (IQR, 41.0–66.0) and an mAIS of 4 or greater in 95.7% (112/117) of this population. Only one primary injured body region was affected in 72.6% (85/117) of fatalities, two primary injured body regions in 25.6% (30/117), and three primary injured body regions in 1.7% (2/117). The primary injured body region most frequently involved in these fatalities was the thorax (38.5% [45/117]), followed by the head (27.4% [32/117]) and lower extremity, pelvis, and buttocks (25.6% [30/117]). The primary injured body region with the highest median NISS was the head (75.0 [IQR, 57.0–75.0]), which also had the most fatalities with an mAIS of 6, as well as the most fatalities having only one isolated primary body region. As 35.9% (42/117) of fatalities had head and/or spine primary body regions affected, the remaining 64.1% (75/117) of fatalities had damage and hemorrhage solely in other primary injured body regions.

TABLE 3. Maximum Abbreviated Injury Scale Primary Injured Body Region of US Coalition Force Fatalities Matched to Armed Forces Medical Examiner System Database (n = 117) Who Died of battle Wounds During Afghanistan Conflict From February 2008 to September 2014

		First Primary Body Region								
		Head	**Face**	**Neck**	**Thorax**	**Abdomen**	**Spine**	**Upper Extremity**	**Lower Extremity, Pelvis, Buttocks**	**External (Skin) and Thermal Injuries**
Second primary body region	None	25	1	2	23	14	5	0	15	0
	Head		0	0	3	0	2	1	0	0
	Face			0	0	0	0	0	0	0
	Neck				1	0	0	0	0	0
	Thorax					5	2	1	10*	0
	Abdomen						1	1	3	0
	Spine							0	0	0
	Upper extremity								1	0
	Lower extremity, pelvis, buttocks									1
	External (skin) and thermal injuries									

*Two of these fatalities also had a third primary body region affected, one of "head" and the other of "abdomen".

Of the 117 US coalition force fatalities, 23 were Role 1 prehospital deaths and 94 were Role 2 facility deaths. Subtracting the 23 US prehospital deaths from the total US casualty population of 3,578 battle-injured casualties provided a remaining US casualty population of 3,555 who received treatment at a Role 2 facility. As 94 of these casualties died, the US coalition % DOW at Role 2 facilities in this study population was equal to 2.6% ([94/3,555] × 100).

DISCUSSION

Increasing the rate of casualty survival from traumatic injury at and between each role of care should be a primary goal for performance improvement efforts within a military trauma system. Hemorrhage and its sequela are a major cause of death in trauma patients.[8,20–24] During the recent conflicts in Afghanistan and Iraq, hemorrhage accounted for 90.9% of prehospital and 80.1% of in-hospital deaths from potentially survivable injuries.[22,23] Thus, hemorrhage control should remain an important area of focus for military trauma systems, along with reducing the time between critical injury and receiving a lifesaving or limb-saving medical capability. As Role 3 and Role 4 medical treatment facilities have more robust resources to provide hospital, intensive, and definitive care, it is especially important to assess patient transport, care, and outcomes that occur prior to reaching these facilities, in the more austere and resource-constrained Role 1 prehospital and Role 2 forward surgical team environments.

The importance of data from Role 1 and Role 2 databases and their ability to translate gaps and lessons learned have been reported.[8,16–18,25–28] Previous Role 2 database studies of casualties from the Afghanistan conflict have provided descriptive

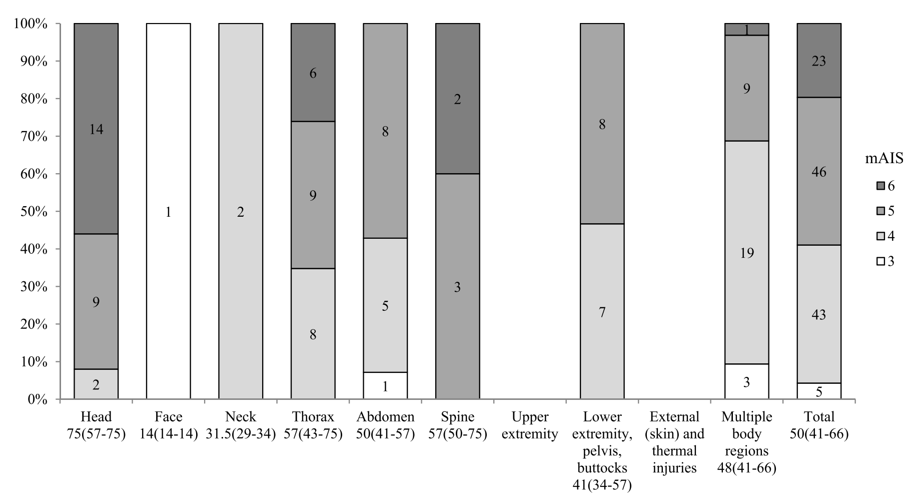

Figure 2. Maximum Abbreviated Injury Score and NISS by primary body region for US coalition force fatalities matched to Armed Forces Medical Examiner System database (n = 117).

analyses on patient profiles of and common injuries treated at Role 2 facilities[16] and type and mode of prehospital transports used to evacuate casualties from Role 1 to Role 2 facilities,[17] as well as transport and en route treatment of casualties between Role 2 and Role 3 facilities.[18] This current study expands beyond previous studies by assessing mortality outcomes among battle-injured casualties transported to and treated at Role 2 facilities during the Afghanistan conflict by location of death and military affiliation. However, for all these studies, data were limited primarily to the Role 2 database, which was not designed to capture details for all injuries, casualties, and fatalities on the battlefield.

Although the study sample distribution by military affiliation noted the largest proportion of casualties was from US coalition forces, the largest proportion of fatalities was seen among ANSF, even though more fatalities were categorized as critical among US coalition forces, and the median prehospital transport times to Role 2 facilities among US coalition forces and ANSF fatalities were not found to be statistically different. However, for those who had documented transport times, a larger proportion of US coalition force fatalities (31.6%) were found to have been evacuated within 60 minutes as compared with ANSF fatalities (18.3%). Although autopsy data were not available for other military affiliation categories, for US coalition force fatalities, of note was that 38.5% had affected primary body regions in noncompressible areas (thorax), and 27.4% had multiple affected primary body regions.

In contrast to a higher proportion of prehospital fatalities reported in previous casualty mortality studies of Afghanistan and Iraq,[20,21,23] most (86.0%) of current study sample fatalities died after arrival and while receiving Role 2 facility care. This may be somewhat artifactual of the Role 2 database given that entry into the database was contingent upon activation of Role 2 surveillance. As the current study relied on casualties that activated Role 2 surveillance, as well as Role 2 personnel to collect and report these data to the Role 2 database, the totality of prehospital deaths was not accounted for during the study time period. This may be particularly so for those casualties who died overtly and near instantaneously, as well as patients who died during transport, as criteria for entry into the Role 2 database were treatment at a Role 2 facility. As observed by a 2012 composite of battlefield deaths in Afghanistan and Iraq,[23] 35.2% of fatalities were instantaneous, 52.1% were acute (minutes to hours) prehospital, and only 12.7% of casualties died of wounds after reaching a medical treatment facility.

In addition to not capturing all prehospital casualties and fatalities, the Role 2 database also did not capture individuals that bypassed Role 2 facilities, as well as data and morbidity and mortality outcomes from non–Role 2 facilities. Furthermore, not all Role 2 casualties and fatalities that occurred were recorded and collected by the Role 2 database, as this database was reliant on Role 2 personnel to capture such data while constrained by resources. Thus, overall case fatality rate, as well as prehospital deaths as percentage killed in action, could not be determined. However, %DOW for Role 2 facility casualties and fatalities was calculated and found to be 4.2%. Although 43.1% of casualties were transported in 60 minutes or less compared with 67.1% in a previous study on transport time,[4] this DOW value was analogous to the overall %DOW of 4.3% previously reported for Afghanistan.[4,8,15] As %DOW is an outcome that can be monitored by a Role 2 facility,[29] this metric can be used and reported for performance improvement by individual surgical teams as well as in aggregate.

Substantial advances in medical documentation and data collection were made during the Afghanistan and Iraq conflicts, amassing the largest repository of combat trauma data in US history. However, data were most robust from Role 4 and Role 3 medical treatment facilities and progressively less so at Role 2 and Role 1 closer to the point of injury. Although the Department of Defense Joint Trauma System implemented standalone software programs to facilitate combat casualty care data capture by forward battlefield providers, these databases rely on resources, connectivity, and the consistent and continuous willingness and compliance of numerous individual units and personnel to use the programs in an environment where data collection and reporting were additional tasks to conduct if time were available versus an integral and expected part of duties. Additionally, data that were captured were being done so mostly by untrained personnel. Therefore, there is nominal assurance of accuracy of reporting, coding, or even data entry.

Subsequently, Role 2 casualty data may be complete, partially complete, or nonexistent, depending on the facility. Thus, the data from the Role 2 database may not be completely representative or inclusive of all casualties treated at or before this role of care. As non-US casualties and fatalities were often lost to follow-up, outcomes and autopsies were not available for further analysis. Without complete autopsies, an accurate description and extent of injuries cannot be provided for fatalities.

After almost 17 years of combat operations, resulting in nearly 60,000 US casualties[30] and innumerable non-US casualties, nonmedical and medical leaders must mandate, train, resource, and enforce comprehensive and continuous documentation and data collection practices at Role 2 facilities. These efforts are needed to support performance improvement, optimize trauma care delivery, and ensure compliance that would otherwise be lost to lack of time, interest, or willingness. If damage control resuscitation and surgery are expectations of a Role 2 facility on the battlefield, the US Department of Defense should also require and facilitate the documentation and data collection of such major interventions.

As hemorrhage continues to be a major cause of death in both battlefield and nonbattlefield environments,[8,20–24] future research efforts must include novel and evolutionary methods to prevent, recognize, and treat hemorrhagic events as soon after injury as possible, particularly from noncompressible truncal hemorrhage, which is currently in need of viable prehospital solutions. Advancements must occur for truncal hemostasis and blood resuscitation to support both presurgical and forward surgical efforts.[31–33] These advances must cover the full spectrum, from point of injury hemostatic interventions to transfusion strategies to medical and procedural interventions, which prevent and mitigate the physiological consequences of hemorrhage. Important areas of focus should include increased involvement from both medical and nonmedical senior leadership; public awareness and education; noncompressible hemorrhage control; prevention, recognition, and treatment of hemorrhagic shock; and evaluation and treatment of intracranial bleeding.

CONCLUSIONS

Role 2 facility care and prehospital care prior to and during transport to Role 2 facilities are important early components of a military joint service battlefield trauma system. Efforts to mandate, train, resource, and enforce medical documentation and data collection practices are required. Filling gaps in data will help to identify medical capability gaps, direct training and equipment procurement, and support future performance improvement and research efforts. Ultimately, meaningful and comprehensive data are paramount to further reduction of battlefield morbidity and mortality.

AUTHORSHIP

R.S.K. and A.M.S. had full access to all the data in the study and take responsibility for the integrity of the data and the accuracy of the data analysis. R.S.K. and A.M.S. were involved in study concept and design. A.M.S., E.L.M., and E.A.M.-S. were involved in data collection, consolidation, and organization. R.S.K. and A.M.S. were involved in statistical analysis. R.S.K., A.M.S., E.L.M., J.M.G., S.A.S., F.K.B., Z.T.S., J.B.H., S.C.N., and E.A.M.-S. were involved in acquisition, analysis, or interpretation of data. R.S.K. and A.M.S. drafted the manuscript. R.S.K., A.M.S., E.L.M., J.M.G., S.A.S., F.K.B., Z.T.S., J.B.H., S.C.N., and E.A.M.-S. critically revised the manuscript for important intellectual content. E.A.M.-S. provided administrative, technical, or material support. R.S.K. and E.A.M.-S. supervised the study.

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DISCLOSURE

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Unrealized potential of the US military battlefield trauma system: DOW rate is higher in Iraq and Afghanistan than in Vietnam, but CFR and KIA rate are lower

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LEVEL OF EVIDENCE: Observational/retrospective/historic controls, level IV. (*J Trauma Acute Care Surg.* 2018;85: S4–S12. Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.)
KEY WORDS: Afghanistan; Iraq; Vietnam; died of wounds; case fatality rate.

The recent conflicts in Afghanistan and Iraq resulted in significant advancements in our understanding of combat casualty care. Important advancements include a better understanding of tourniquet use, blood transfusion therapy, and the use of extracorporal lung oxygenation for pulmonary salvage. These advancement and others, firmly grounded in scientific study, saved many lives over more than a decade of war in Afghanistan and Iraq. However, throughout the conflict, researchers, clinicians, and medical leaders have been vexed by the consistently high died of wound percentage (%DOW) as compared with Vietnam War, and its relationship to an apparently improved case fatality rate (CFR), and a decrease in Service Members killed in action (%KIA).

Further complicating the problem is variability in the way died of wounds is calculated, how those excluded from the equation as return to duty wounded are defined, and how variability in data collection can impact the results. Uncontrollable variables that change over time and even within conflicts further impact our ability to understand the significance of the changes in %DOW and can lead to assumptions that may not be valid. It is important, then, to understand as much as possible the medical and non-medical factors that confound our understanding of combat casualty statistics.

This paper reports that although CFR and %KIA have improved, the %DOW has increased. The authors also report the relationship of the CFR, %KIA, %DOW, and Injury Severity Score (ISS) over time for Operations Enduring and Iraqi Freedom. Importantly, the literature is sampled in such a way as to begin to understand the aforementioned confounders that, correctly interpreted, will allow the prioritization of research and performance improvement initiatives required to improve surgical outcomes on future battlefields.

Operation Enduring Freedom in Afghanistan and Operation Iraqi Freedom in Iraq were the Nation's first prolonged wars since Vietnam that generated significant numbers of casualties. Given that many of the elements of a modern trauma system were present during the Vietnam, Iraq, and Afghanistan conflicts, a comparative analysis of outcomes is appropriate and may reveal evidentiary gaps in battlefield trauma care delivery.

The combat casualty care statistics most commonly referred to when evaluating combat casualties are the killed in action rate or percentage (%KIA), died of wounds rate or percentage (%DOW), and the case fatality rate (CFR)[1] (Table 1). The %KIA measures fatalities that occur before admission to a military treatment facility (MTF). The %DOW considers those wounded who died after reaching a MTF in relationship to all admissions. The CFR considers all deaths including those who die pre-MTF and those who die of wounds any time after admission.[1]

The %DOW has the potential to broadly, without unit, facility, or team level granularity, assess surgical outcomes. The %KIA accounts for severity of wounding and pre-hospital care and CFR is a summary statistic of both KIA and DOW, encompassing all factors that influence both lethality and survivability on the battlefield.[1] Although much has changed since the Vietnam War, some of the components of the modern battlefield trauma system were

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TABLE 1. Combat Mortality: Definitions and Statistics

Combat mortality	Definition	Equations
Killed in action (KIA)	The number of combat deaths that occur before reaching a MTF	$\%\text{KIA} = \frac{\text{Deaths before MTF}}{\text{KIA} + (\text{WIA}-\text{RTD})} \times 100$
Died of wounds (DOW)	The number of deaths that occur after reaching a MTF	$\%\text{DOW} = \frac{\text{Died after reaching MTF}}{(\text{WIA}-\text{RTD})} \times 100$
Case fatality rate (CFR)	A measure of overall lethality in all those wounded; all deaths compared with all wounded included those who DOW	$\text{CFR} = \frac{\text{KIA}+\text{DOW}}{\text{KIA}+\text{WIA}} \times 100$

MTF, medical treatment facility; WIA, wounded in action; Holcomb et al.[1]

present in both eras; therefore, understanding whether %KIA, %DOW, and CFR achieved in Afghanistan and Iraq is higher or lower as compared with Vietnam is potentially informative of gaps in the current combat trauma system.

The objectives of this paper were to compare the %KIA, %DOW, and CFR achieved in Afghanistan and Iraq to those of Vietnam; determine the trends in %KIA, %DOW, CFR, and ISS; understand how to best analyze MTF battlefield outcomes to propose future methods of rapid assessment as well as optimal and timely performance improvement; and identify potential gaps to focus future military research efforts.

PROCESS

The period of the Vietnam conflict was November 1955 to May 1975, Afghanistan October 2001 to December 2014, and Iraq March 2003 to August 2010. All databases are updated when a US Service Member dies of wounds and were last checked December 8, 2017.

The mortality rate trends for US Service Members treated in MTFs during these periods were analyzed. Data sources for this study include [1] monthly aggregate numbers of KIA and DOW from the Defense Manpower Data Center's Defense Casualty Analysis System (DCAS), [2] monthly aggregate numbers of returned to duty (RTD) from U.S. Central Command (CENTCOM), and [3] records of U.S. military service members who sustained injury and were registered in the Department of Defense Trauma Registry (DODTR). DCAS aggregate data were used to calculate combat mortality parameters %KIA, %DOW, and CFR using the formulas in Table 1. Monthly aggregate KIA and DOW data were extracted from the DCAS, and combined with the CENTCOM data to ascertain numbers of RTD. DCAS data were used to calculate %KIA and %DOW for Vietnam and includes all casualties and a subset of Army-only data from November 1955 to May 1975. The RTD wounded for Vietnam are those 150,341 injured who were either immediately returned to duty (carded for record only) or treated at a non-surgical facility and then RTD (Fig. 1).

DODTR data were used to calculate ISS among Afghanistan and Iraq patients; ISS could not be determined for Vietnam injuries. Primary outcome was combat mortality expressed as %KIA, %DOW, and CFR comparing the recent conflicts to Vietnam with RTD patients both excluded and included. Secondary outcomes were evaluations of annual trends in these parameters, and trends in injury severity from 2003 to 2014. The %KIA, %DOW, and CFR were calculated using the formulae in Table 1. Trends in ISS, %KIA, %DOW, and CFR were calculated using the weighted moving average (WMA) method and by linear regression. The WMA method, a simple form of smoothing technique, was used to filter out random noise by smoothing random fluctuations and accounting for seasonal trends. Linear regression of %KIA, %DOW, CFR, and ISS on time by years was used to test for linear trend. The χ^2 test was used to determine significant associations in %KIA, %DOW, and CFR between Afghanistan, Iraq, and Vietnam. Other descriptive statistical tests were used where appropriate. Analyses were performed using SAS (version 9.4; SAS Institute, Cary, North Carolina, USA).

FINDINGS

Demographic data are provided in Table 2. The %KIA, %DOW, and CFR are reported with and without RTD patients in Table 3. Both are included for the purpose of clarity as these parameters with RTD *included* have been compared with Vietnam statistics with RTD *excluded*.[2,3] The remainder of this paper will present %KIA and % with RTD patients excluded.

CFR and %KIA have Improved Since Vietnam

CFR and %KIA significantly improved in Afghanistan and Iraq, when compared to Vietnam (all $p < 0.0001$). CFR for Afghanistan was 15.1, Iraq 21.4, and Vietnam 23.2. The %KIA for Afghanistan was 11.3, Iraq 16.4, and Vietnam 20.5 (Table 3).

%DOW Has Increased Since Vietnam

The %DOW was higher for Afghanistan and Iraq compared with Vietnam (all $p < 0.0001$). The average combined Afghanistan/Iraq %DOW was 5.3% with a %DOW of 4.3% for Afghanistan and %DOW of 6.0% for Iraq as compared with Vietnam %DOW of 3.3% (Table 3).

Combat Mortality Trends

The %KIA and CFR decreased in both Iraq and Afghanistan ($p < 0.0001$). The %DOW trended lower in general in Afghanistan, but variability was noted and this decrease did not reach significance ($p = 0.09$). However, the observed increase of %DOW over time in Iraq was significant ($p < 0.0001$). ISS increase over time was small but did not reach significance in Afghanistan ($p = 0.07$) nor Iraq ($p = 0.09$). The relationship and trends between the combat mortality parameters and ISS are illustrated for Iraq (Fig. 2A) and Afghanistan (Fig. 2B). Figure 3 shows trends for DOW in Afghanistan/Iraq.

Figure 1. Cohort description and inclusion criteria. Figure 1 illustrates cohort description and inclusion criteria. Nine study sets were stratified and used for specific purposes as described at the bottom left of the figure.

These data demonstrate CFR and %KIA decreased in recent conflicts compared with Vietnam, and CFR and %KIA improved in both Afghanistan and Iraq.[1,4] However, %DOW increased in Afghanistan and Iraq compared with Vietnam, and although %DOW appears to have decreased in Afghanistan, it increased in Iraq.

The %KIA is considered a measure of weapons lethality, point of injury, and pre-hospital care; CFR is a composite measure of overall battlefield mortality.[1] Bellamy emphasized three factors when considering the "magnitude of the percentage of the population who are KIA": weapons lethality, "feasibility of first-aid", and evacuation of the patient to effective treatment.[5] Of these factors, weapons lethality is historically the most consequential given that 82% of battlefield deaths have been near instantaneous because of the lethality of military weapons, whereas medical care and transport times are modifiable factors.[6] Advances in pre-hospital tactical combat casualty care have been mitigating factors; it has been estimated that optimal pre-hospital care and rapid evacuation can prevent death in up to 25% of those with previously fatal injuries.[7]

The %DOW reflects care provided once a casualty has reached a battlefield MTF; the patient must arrive alive at the MTF (a measure of available and quality pre-hospital care and transport time) where these units are usually equipped with surgical capability. The %DOW has historically been 3.5%, with an inverse relationship between KIA and DOW.[1,5] Because the CFR is an aggregate summary statistic and accounts for all who die, it will change according to %KIA and %DOW while taking into account the total number wounded. Given that over 80% of combat casualties are KIA, CFR trend usually follows %KIA. In recent conflicts, weapons lethality was the most prominent factor in those who died before reaching a MTF. Therefore, if %KIA is predominantly considered a measure of weapons lethality and %DOW a measure of MTF trauma care, then overall battlefield lethality has decreased in Afghanistan/Iraq compared with Vietnam, whereas MTF mortality has increased.

Battlefield statistical measures pivot based on the complex and multifactorial nature of the combat environment. The %KIA, %DOW, and CFR are composite statistics and may change significantly based on medical and non-medical factors such as weapons lethality, tactics, body armor, vehicle armor, point-of-injury care, medical evacuation capabilities, and availability and types of surgical capabilities.[1] To understand the effects of external confounders, the significance of decreased CFR and %KIA, and the increase in %DOW, patient-specific data are required. However, although patient-specific data are available for Afghanistan and Iraq since the establishment of the DODTR, these are unavailable for Vietnam. However, it is possible to understand relevant wounding mechanisms, injury types, evacuation times, weapons lethality, and causes of deaths by briefly reviewing the available literature from Iraq, Afghanistan, and Vietnam.

TABLE 2. Demographic Characteristics of Casualties in OEF, OIF, and Vietnam War

	OEF*	OIF**	Vietnam/Deaths†	*p* Value
N	20,093	31,957	58,220	
Male, n (%)	19,644 (97.8)	31,220 (97.7)	58,212 (99.99)	
Age, n (%)				<0.0001
<22	4,927 (24.4)	8,893 (27.8)	35,375 (60.8)	
22–24	5,713 (28.4)	7,998 (25.0)	11,170 (19.2)	
25–30	5,911 (29.4)	7,554 (23.6)	6,677 (11.5)	
31–35	1,847 (9.2)	3,064 (9.6)	2,539 (4.4)	
>35	1,534 (7.6)	2,865 (9.0)	2,459 (4.2)	
Unknown	161 (0.8)	1,593 (5.0)	—	
Race/ethnicity				<0.0001
White	16,366 (81.5)	25,909 (81.1)	49,830 (85.6)	
Black	1,408 (7.0)	2,727 (8.5)	7,243 (12.4)	
Other	2,319 (11.5)	3,321 (10.1)	1,147 (2.0)	
Military service				<0.0001
Air Force	520 (2.6)	502 (1.4)	450 (1.4)	
Army	14,205 (70.7)	25,463 (68.5)	22,230 (69.6)	
Marine	4,945 (24.6)	9,649 (26.0)	8,626 (27.0)	
Navy	423 (2.1)	753 (2.0)	650 (2.0)	
Officer, n (%)	1,325 (6.6)	2,307 (6.2)	1,880 (5.9)	

p Values were calculated from χ^2 test.

OEF, Afghanistan, Operation Enduring Freedom; OIF, Iraq, Operation Iraqi Freedom.

*Casualties by demographic data for OEF were extracted from https://dcas.dmdc.osd.mil/dcas/pages/casualties_oef.xhtml retrieved on December 8, 2017.

**Casualties by demographic data for OIF were extracted from https://dcas.dmdc.osd.mil/dcas/pages/casualties_oif.xhtml retrieved on December 8, 2017.

†Casualties by demographic data for OIF were extracted from https://dcas.dmdc.osd.mil/dcas/pages/casualties_vietnam.xhtml retrieved on December 8, 2017.

*,**WIA data were used for demographic characteristics in OEF and OIF.

†No WIA data are available. Thus, data were used for demographic characteristics of U.S. Service members in the Vietnam War included total deaths (DOW, KIA, non-hostile deaths, and missing and captured presumed deaths). Presumed/other deaths included missing in action—declared dead (n = 1,085), captured—declared dead (n = 116), missing—presumed dead (n = 123), and other deaths (n = 10,663).

Pre-Hospital Deaths: Vietnam

Maughon analyzed death certificates of 2,600 US Service Members KIA in Vietnam and found the most common body regions associated with death were head (39.3%), chest (37%), abdomen (9%), neck (7.3%), and extremities (7.4%).[8] An analysis of 8,000 Vietnam casualties from the Wound Data and Munitions Effectiveness Team's data, collected from 1967 to 1969, determined the most common body regions involved in fatal wounds were head (38%), chest (24%), and abdomen (9%). Over 72% of soldiers KIA from head wounds suffered massive non-survivable brain injuries. Similarly, over 62% of chest injuries resulted in near-immediate death with injuries to the heart, great vessels, trachea, and lung. About 17% of abdominal injuries resulted in pre-hospital death from hemorrhage involving major vascular structures or the liver. Extremity injuries were the primary site of injury in 3% of pre-hospital deaths.[5] The primary pathophysiological cause of death in Vietnam was exsanguination (44%) followed by central nervous system injuries (36%).[5]

Pre-Hospital Deaths: Afghanistan and Iraq

The most comprehensive study of pre-hospital deaths in Afghanistan and Iraq was an evaluation of 4,596 battlefield deaths led by Eastridge. They found that the head was the primary site of fatal injury in 34.2% and chest in 23.1%. Dismemberment (multiple body regions) accounted for fatal injury in 12.8%, high spinal cord injury 3.3%, and the abdomen 2.3%. Of these injuries, 75.7% were deemed non-survivable with fatal injuries similar to those observed in Vietnam including destructive brain injury, heart and great vessel injury, and destructive abdominal vascular injuries. Extremity injuries were the primary site of fatal injury in 3.7%.[9] Depending on whether the pathophysiological cause of death in dismemberment is hemorrhage, 42% to 55% of deaths in these patients appear to be from exsanguination. Eastridge also reported 87% of deaths in Afghanistan/Iraq occurred before MTF admission, which is similar to the 88% reported rate in Vietnam.[5] The autopsy papers from

TABLE 3. Comparison of %KIA, %DOW, and CFR With and Without Minor Wounds (RTD) Included in the Equation

						Included RTD*			Excluded RTD**		
Study population	**KIA**	**DOW**	**WIA**	**RTD**	**WIA-RTD**	**%KIA**	**%DOW**	**CFR**	**%KIA**	**%DOW**	**CFR**
OIF† and OEF‡											
OIF + OEF	3,835	1,226	49,990	26,662	23,328	7.1	2.5	9.4	14.1	5.3	18.6
OIF	2,486	765	30,094	17,394	12,700	7.6	2.5	10.0	16.4	6.0	21.4
OEF	1,349	461	19,896	9,268	10,628	6.3	2.3	8.5	11.3	4.3	15.1
Vietnam War§											
Total	40,934	5,299	308,943	150,341	158,602	11.7	1.7	13.3	20.5	3.3	23.2
Army	27,047	3,610	205,135	104,723	100,412	11.6	1.8	13.2	21.2	3.6	24.0

Data were expressed as numbers unless otherwise noted.

KIA, killed in action; DOW, died of wounds; CFR, case fatality rate; WIA, wounded in action; RTD, returned to duty; OIF, Iraq, Operation Iraqi Freedom; OEF, Afghanistan, Operation Enduring Freedom.

*Number of patients with injuries regardless of minor injury or RTD within 72 hours were included in the denominator of %KIA, %DOW, and CFR calculation.

**Number of patients with minor injuries and RTD within 72 hours were not included in the denominator of %KIA, %DOW, and CFR calculation.

†Study time period for OIF was from November 2003 to July 2010, retrieved on December 8, 2017 from https://dcas.dmdc.osd.mil/dcas/pages/casualties_oif.xhtml and combined with the given DMDC data and RTD data from CENTCOM.

‡Study time period for OEF was from November 2003 to December 2014, retrieved on December 8, 2017 from https://dcas.dmdc.osd.mil/dcas/pages/casualties_oef.xhtml and combined with the given DMDC data and RTD data from CENTCOM.

§Vietnam War data were extracted from DCAS data in time period of November 1955 to May 1975, retrieved on December 8, 2017 from https://dcas.dmdc.osd.mil/dcas/pages/report_vietnam_sum.xhtml.

Figure 2. Trends in mortality and severity of combat casualty in OEF and OIF. Figure 2 illustrates trends in killed in action (%KIA), died of wounds (%DOW), case fatality rate (CFR), and Injury Severity Score (ISS) in Iraq, Operation Iraqi Freedom (OIF) in (A) and in Afghanistan, Operation Enduring Freedom (OEF) in (B). The left *y*-axis indicates CFR, %KIA, and %DOW. The right *y*-axis indicates ISS value. OIF ended on August 30, 2010.

Afghanistan/Iraq also evaluated potentially survivable deaths, which accounted for up to 25% of KIAs.[5] Therefore, it appears causes of total KIA casualties are similar between conflicts and were most commonly caused by destructive damage to the head/thorax or exsanguination.

Weapons Lethality Between Conflicts

Although the mechanisms of fatal injury between conflicts are similar, ratios of KIA to WIA casualties differ. In Vietnam, there were 40,934 total KIA deaths and 150,344 wounded (Table 3). This resulted in 1:4 KIA/WIA ratio for Vietnam. In Afghanistan/Iraq, there were 3,835 KIA deaths and 23,328 wounded (Table 3) resulting in a KIA/WIA ratio of 1:7. These ratios suggest weapons lethality was potentially higher in Vietnam than in Afghanistan/Iraq. One factor supporting this possibility is known lethality effects of ballistic assault weapons compared with fragmentation weapons (including improvised explosive devices) and the essential "zone of injury" of the casualty. The probability of death from fragmentation wounds ranges from 1:5 to 1:7 whereas the probability of death from high-velocity gunshot wounds is about 1:3.[5] In Vietnam, 51% of deaths were the result of gunshot wounds and 47% resulted from fragmentation weapons, booby traps, and mines.[10] Eastridge showed 73.7% of fatal wounds were caused by explosive (fragmentation) devices and 22.1% by gunshot wounds in Afghanistan/Iraq.[9] Although ISS scores are not available from Vietnam for comparison, it is interesting that 83% of wounded in Afghanistan/Iraq had wounds categorized as minor or moderate by ISS (see Fig. 4). Additionally, 53.3% of Afghanistan/Iraq wounded were categorized RTD whereas in Vietnam 48.7% of wounded were categorized RTD (Table 3).

A significant confounder is the use of advanced body armor in the recent conflicts. Information on the protective effects of body armor is not entirely understood as extensive data

Figure 3. %DOW in OIF and OEF. Figure 3 exhibits trends of %DOW in Iraq, Operation Iraqi Freedom (OIF) and Afghanistan, Operation Enduring Freedom (OEF) during the study period. Vertical referent line indicates that OIF was ended on August 30, 2010.

regarding its protective effects are classified; however, it can be presumed to decrease the lethality of certain weapons or has the potential to convert fatal wounds into non-fatal wounds, and in some cases completely prevent injury. The wide-scale use of body armor by US Service Members in Operation Desert Storm resulted in a reduction in thoracic injuries to 5% from the 13% that occurred in Vietnam.[11] This reduction in thoracic injuries was sustained in Afghanistan and Iraq.[11] Another similar confounder is the protective effects of armored vehicles reflected in the variations of wounding patterns between mounted and dismounted troops.[12]

Improved Pre-Hospital Care in Afghanistan/Iraq

The %KIA can be affected by care provided from point of injury and by availability and speed of patient evacuation to surgery. Eastridge reported that tourniquet implementation resulted in a decrease of preventable deaths from extremity hemorrhage from 23.3 deaths per year before implementation to 3.5 per year after implementation.[9] Similarly, Kotwal reported %KIA improved significantly from 16.0% to 9.9% and CFR improved from 13.7% to 7.6% in Afghanistan after a mandate requiring transport of wounded to a surgical capability within 1 hour of wounding was implemented.[4] This change decreased median evacuation time from 90 to 43 minutes, and was achieved in part by increasing the number of MEDEVAC helicopters by 25% to 18 total aircraft in Afghanistan, and increasing the number of forward surgical teams available.[4] The end result of increasing both helicopters and surgical units was faster time to surgical intervention. Additionally, Shackelford

Figure 4. Distribution of injuries severity levels in OEF and OIF. Figure 4 shows a comparison of four injury severity levels: 1–8 (mild), 9–15 (moderate), 16–24 (severe), and ≥25 (critical injury) between Afghanistan, Operation Enduring Freedom (OEF) and Iraq, Operation Iraqi Freedom (OIF). Significant differences were observed in moderate injury (OIF > OEF) and in critical injury (OEF > OIF).

reported substantial improvement in outcomes with pre-hospital blood product transfusion within 15 minutes of injury; survival improved from 23% to 13%.[13] It is reasonable to conclude that tourniquet placement, pre-hospital blood product transfusion, and improved evacuation times accounted, in part, for improvements in the %KIA and CFR within Afghanistan and Iraq.

Evaluating effects of tourniquets and evacuation times on %KIA and CFR when comparing Vietnam with the recent conflicts is challenging because little data exist on tourniquet use and effectiveness from Vietnam. However, in Vietnam, average patient evacuation times were reported to have generally been within 1 hour, and at the peak of the Vietnam War in 1968, 116 MEDEVAC helicopters were available to transport wounded to 19 field hospitals distributed throughout South Vietnam.[14] This capability was reported to have contributed to the improvement in CFR from 26.3% in Korea to 19.0% in Vietnam and is thought to have resulted in hospital mortality of 2.5% in Korea to 2.6% in Vietnam because more severely wounded arrived alive from the battlefield.[10] Whether evacuation times were substantially different between recent conflicts and Vietnam is difficult to know. However, reduction of time to blood and surgery in Afghanistan and Iraq did contribute to improvement in the CFR and %KIA.

%DOW Higher in Afghanistan/Iraq Compared with Vietnam

Though the absolute value and change is relatively small, this analysis demonstrated the %DOW in Afghanistan and Iraq was significantly higher than the %DOW in Vietnam ($p < 0.001$).[1,4] It is difficult to determine the cause of this change without ISS from Vietnam; however, this finding deserves further analysis and is certainly hypothesis generating. A comparative analysis of individual MTF outcomes as well as wound burden may further elucidate this observation.

Hospital Outcomes: Vietnam

Arnold et al. performed the largest Vietnam study of hospital outcomes of 132,996 admissions to 19 hospitals in South Vietnam from January 1969 to December 1969.[15] There were 1,162 (1.97%) deaths in combat-related surgical patients. Hemorrhage accounted for 23.9% of all deaths and 61% of those deaths occurred with 24 hours. Head injuries were responsible for 42.5% of all deaths after admission (Table 4).

TABLE 4. Causes of In-Hospital Deaths (DOW)

Author	N	Head (%)	Hemorrhage (%)	Burn (%)	Sepsis/ MOF (%)	Other (%)
OIF/OEF						
Nessen et al. (2009)	16	37	25	13.0	13.0	12.0*
Eastridge et al. (2011)	558	45	49**	0.0	4.0	2.0
Martin et al. (2009)	151	45	32	9.0	7.0	7.0
Vietnam						
Arnold et al. (1978)	1,162	42.5	23.9	3.1	11.7	6.1
Feltis et al. (1970)	121	***	53.6	0.0	19.7	26.7

DOW, died of wounds; OEF, Afghanistan, Operation Enduring Freedom; OIF, Iraq, Operation Iraqi Freedom; MOF, multisystem organ failure.

*Hemorrhage from multiple sources.

**Hemorrhage in this study was defined as truncal, junctional, and extremity.

***Traumatic brain injured patients not treated at this hospital.

Feltis et al. reported the outcomes of 6,927 patients admitted to a single Evacuation Hospital from January 1966 to June 1968.[16] Interestingly, this hospital did not receive patients with neurological injuries who were sent to a specialty hospital. Of 121 deaths reported (1.8%), hemorrhage was the cause of death in 53.6% overall with 86.8% of those patients succumbing within 24 hours (Table 4). Wound distribution was 11.3% head/neck, 10.1% thorax, 14.0% abdomen, and 64.6% extremity (Table 5).

Heaton evaluated outcomes of 7,896 hospitalized patients from October 1965 to January 1966.[16] Of 214 deaths (2.72%), 60% died within 24 hours of admission. Wound distribution was head and neck 12%, thorax 7.2%, abdomen 7.1%, and extremity 63% (Table 5). Body regions involved were head/neck 8.5%, thorax 7.9%, abdomen 9.3%, and extremities 1.7%; 49.6% suffered fragmentation injury and 42.7% suffered gunshot wounds.[17]

Hospital Outcomes: Afghanistan and Iraq

Zouris reporting on 279 wounded Sailors and Marines in Iraq (2003) found intracranial head injury 3.9%, head/neck/face injury 14.7%, chest injury 5.0%, abdomen/pelvis injury 3.6%, and extremity injury 68.4% (Table 5). Fragmentation wounds was the most prevalent wounding mechanism (32%) followed by gunshot wounds (25.1%).[18]

In Afghanistan, Nessen reported the outcomes of a forward surgical team's treatment of 761 patients treated at two locations.[19] This study removed RTD patients and included wounded local nationals and reported a %DOW of 2.36% among all casualties and 1.45% for U.S. Service Members. The average ISS among those who died of wounds was 47.1. The distribution of wounds for Service Members was head/neck 13.9%, thorax 3.7%, abdomen 2.6%, and extremities 54.3% (Table 5). The causes of death were head (37%), thorax (1%), burns (13%), and abdominal hemorrhage (25%) (Table 4). Explosive devices were responsible for injury in 57.3% of Service Members with gunshot wounds accounting for 16.9% of injuries in this study.[19] Owens reported on the 1,566 combat wounded Service Members in Afghanistan from October 2001 to January 2005.[20] This study excluded RTD patients and reported a %DOW of 3.4%. Fragmentation injuries from improvised explosive devices caused 79% of wounds whereas GSW accounted for 19%. The distribution of wounds was head/neck in 29.4%, thorax in 5.6%, abdomen in 10.7%, and extremities in 54.1% (Table 5). This paper did not report the causes of death in DOW casualties.[20]

Belmont reporting on 7,877 combat casualties in Afghanistan/Iraq from 2005 to 2009 found head/face/neck injury 28.1%, chest 9.9%, abdomen 10.1%, and extremity injury 51.9% (Table 5). Wounding mechanism was explosive 74.4% and gunshot wounds 19.9%. The %DOW was reported 8.98% for Iraq and 7.70% for Afghanistan.[21]

In an autopsy study, Eastridge reported on 558 Afghanistan/Iraq Service Members who died of wounds from October 2001 to June 2009.[21] They categorized patients as having potentially survivable (PS) (51.4%) or non-survivable wounds (NS) (48.6%). Wounding mechanisms were explosive (72%) and gunshot (25%). The predominant cause of death in NS patients was head injury (83%) and hemorrhage (80%) for PS. Interestingly, 51%

TABLE 5. Patterns of Wounding

Author	N	Head (%)	Head/neck/face (%)	Chest (%)	Abs/pelvis (%)	Extremity (%)	Other + (%)
OIF/OEF							
Nessen et al. (2009)	761	6.1	13.9	3.9	2.6	54.3	19.2
Owen et al. (2008)	1,566	8.0	22.0	6.0	11.0	54.0	0.0
Belmont et al. (2012)	7,896	0.0*	28.1	9.9	10.1	51.9	0.0
Vietnam							
Heaton et al. (1966)	6,927	0.0*	12.0	7.2	7.1	63.0	10.7
Feltis et al. (1970)	6,927	0.0*	11.3	10.1	14.0	64.6	0.0
Neel (1973)	**	0.0*	14.0	7.0	5.0	54.0	20.0

Abs, abdominal cavity; OEF, Afghanistan, Operation Enduring Freedom; OIF, Iraq, Operation Iraqi Freedom.
+ Other: vascular, uro/gyn, spine, soft tissue, multiple wounds, or not defined by author.
*Head, neck, facial wounds not distinguished from intracranial injury by authors.
**Source: Statistical Data on Army Troops Wounded in Vietnam, January 1965–June 1970, Medical Statistics Agency, Office of the Surgeon General, U.S. Army.

of patients categorized PS arrived with cardiopulmonary resuscitation in progress, which suggests that their survival required more effective pre-hospital care as opposed to surgical care. The regions of PS hemorrhage were listed as truncal (48%), peripheral extremity (31%), and junctional (21%).

Martin reviewed 151 deaths (including local nationals) for opportunities for improvement at a single combat support hospital in Iraq from January 2007 to January 2008.[22] Cause of death was head injury in 45% and hemorrhage in 32% (Table 4). Interestingly, in this study, gunshots were responsible for 47%, and explosion injuries for 42% of wounds, which demonstrates theater trends may vary over time at the regional level; and as noted earlier, gunshot wounds are relatively deadlier than fragmentation weapons. Their study found that high preventability scores were related to hemorrhage control pre-hospital and during the early hospital resuscitation phase; preventability of death could be attributed to the individual provider level in 70% of cases; and opportunities for improvement were found in 78% of non-expectant deaths. The authors concluded that imperfect trauma care and hemorrhage control early in the process contributed to later deaths in the operating room and recovery. They also concluded that opportunities for improvement existed at all levels of the trauma system. The authors concluded, "Process improvement efforts should focus on both fully supporting the needed training and supplies, but also on policies that remove barriers or delays and make critical aspects of trauma care as automated a process as possible."[23]

This limited review of the available literature on patients surviving to hospital admission in Afghanistan, Iraq, and Vietnam demonstrated predominate causes of mortality continue to be head injury and hemorrhage. Previous studies have shown thoracic injuries and abdominal injuries were more common in hospitalized patients in Vietnam compared with Afghanistan/Iraq.[12] Extremity injures were prevalent in both periods (Table 5). Wounded surviving to admission were also more likely to have a fragmentation mechanisms of injury. Although mechanism and cause of death seem similar, it is not possible to precisely explain the increase in %DOW in Afghanistan/Iraq without patient specific wound severity data, particularly as it relates to traumatic brain injury and anatomical site of hemorrhage.

Died of Wounds Trends in Afghanistan and Iraq

The %DOW trended downward in Afghanistan. Figure 3 shows the most improvement from 2005 to 2008, after which %DOW increases. In Iraq, the trend is upward starting in 2005 with relative stabilization after 2006. Understanding these trends will be important to effective battlefield performance improvement and future studies should be focused in this area.

Injury Severity Stable Over time in Operation Enduring Freedom/Operation Iraqi Freedom

Injury Severity Scores did not significantly change over time in Afghanistan and Iraq. However, it is possible regional and local increases in injury severity affected %DOW as mortality rates are associated with injury severity. Langan studied casualties who received a massive transfusion and died of wounds before and after damage control resuscitation guidelines were established, and found mean ISS had increased from 22.5 to 26.7.[24] Patel demonstrated %DOW in Afghanistan/Iraq was correlated to injury severity, and significant regional variation occurred within units and hospitals, which may not be apparent at the theater level, especially considering 83% of wounded received minor or moderate injuries.[25]

Limitations

This study has limitations intrinsic to the retrospective nature of the analysis, those associated with large data repositories and historical aggregated reports from Vietnam including misclassification bias, observer bias, survivor bias, and data integrity. These problems are likely exacerbated when combining databases. Difficulty in obtaining data before a casualty arriving at a combat support hospital in the recent conflict may have resulted in survivor bias in the DODTR and could specifically affect ISS, CFR, %KIA, and %DOW by excluding patients who died at forward surgical teams and were not included in the database.

CONCLUSION

The CFR and %KIA achieved during Afghanistan and Iraq were improved compared with Vietnam and improved during the recent conflicts. The %DOW in Iraq and Afghanistan is higher than in Vietnam. Although summary statistics are dependent on multiple medical and non-medical confounders, the increase of %DOW compared with Vietnam as well as the increase in %DOW over time in Iraq is concerning and warrants further investigation. A vital component of any trauma system is continuous performance improvement in order to improve survivability from injury.[26] This analysis indicates that systems should be implemented supporting rapid battlefield performance improvement measures capable of detecting changes in outcome measures like %DOW, %KIA, or CFR to enable responsive performance improvement measures. Developing sustainable, robust, accurate, and timely performance improvement mechanisms has the potential to not only improve the battlefield trauma system but also the civilian trauma system. These findings should prompt study of the effectiveness and capabilities of the current DOD battlefield trauma system, including individual pre-hospital and surgical units. Understanding the causal factors of both increases and improvement of the %DOW over time will be critical to effective and sustainable battlefield performance improvement of surgical units.

AUTHORSHIP

S.C.N., J.G., A.P.C., E.M.-S., T.D.L., S.S., T.E.R., and J.B.H. contributed to study design, data acquisition, analysis and interpretation and were actively involved in the drafting and critical revision of the manuscript and who provided final approval of the version to be published.
K.N.R., K.A., B.E., D.J., Z.S., C.K.M., K.G., J.S., and R.M. contributed significantly to study analysis and interpretation of data and were actively involved in the drafting and critical revision of the manuscript and have provided final approval of the version to be published.

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Analysis of Pediatric Trauma in Combat Zone to Inform High-Fidelity Simulation Predeployment Training

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Objectives: The military uses "just-in-time" training to refresh deploying medical personnel on skills necessary for medical and surgical care in the theater of operations. The burden of pediatric care at Role 2 facilities has yet to be characterized; pediatric predeployment training has been extremely limited and primarily informed by anecdotal experience. The goal of this analysis was to describe pediatric care at Role 2 facilities to enable data-driven development of high-fidelity simulation training and core knowledge concepts specific to the combat zone.

Setting and Patients: A retrospective review of the Role 2 Database was conducted on all pediatric patients (< 18 yr) admitted to Role 2 in Afghanistan from 2008-2014.

Interventions: Three cohorts were determined based on commercially available simulation models: Group 1: less than 1 year, Group 2: 1-8 years, Group 3: more than 8 years. The groups were sub-stratified by point of injury care, pre-hospital management, and Role 2 facility medical/surgical management.

Measurements and Main Results: Appropriate descriptive statistics (chi square and Student t test) were utilized to define demographic and epidemiologic characteristics of this population. Of 15,404 patients in the Role 2 Database, 1,318 pediatric subjects (8.5%) were identified. The majority of patients were male (80.0%) with a mean age of 9.5 years (± SD, 4.5). Injury types included: penetrating (56%), blunt (33%), and burns (7%). Mean transport time from point of injury to Role 2 was 198 minutes (±24.5 min). Mean Glasgow Coma Scale and Revised Trauma Score were 14 (± 0.1) and 7.0 (± 1.4), respectively. Role 2 surgical procedures occurred for 424 patients (32%). Overall mortality was 4% ($n = 58$).

Conclusions: We have described the epidemiology of pediatric trauma admitted to Role 2 facilities, characterizing the spectrum of pediatric injuries that deploying providers should be equipped to manage. This analysis will function as a needs assessment to facilitate high-fidelity simulation training and the development of "pediatric trauma core knowledge concepts" for deploying providers. (*Pediatr Crit Care Med* 2018; XX:00–00)

Key Words: military; pediatric; simulation; trauma

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The modern battlespace presents many unique challenges to military medical providers due to an ever-changing and evolving combat environment. Military medical treatment facilities (MTFs) are positioned in a manner designed to mitigate potential risk to combatants as well as to treat anticipated casualties. Given the shift to asymmetrical combat actions, the "Role 2" (R2) MTF, which typically has modest inpatient management and holding capability and limited surgical capability (e.g., Forward Surgical Teams [FSTs]), has become the most widely used medical asset on the modern battlefield. Compared to the Role 1 aid station which provides basic first aid and emergency care with a single medical provider with very limited resources, R2 boasts a greater capacity for acute resuscitation, limited inpatient management, and the augmented ability to perform initial surgical procedures. R2 MTFs with FSTs are capable of damage control resuscitation (with blood products) and surgery, as well as other life and limb-saving procedures, prior to transfer to R3 MTFs which are the highest level of care on the battlefield. Role 3 facilities have longer holding capacity with some specialty care and ancillary support but are limited by their logistical needs and lack of mobility. By comparison, the need to put emergency surgical services close to the point of injury in a very large area of operations, most surgical care is performed at the smaller and more mobile R2 facilities (1, 2). However, both R2 and R3 facilities can provide compassionate nonsurgical, nontrauma care based on the medical rules of engagement, available resources, and tactical situation.

One of the missions for medical teams at the R2 is to support the local national population including injured children who are frequently the unintended victims of war. The management of these children involves initial stabilization, resuscitation, and transport to a role of care or host nation facility with the necessary capabilities. R2 MTFs provide life-saving interventions in order to bridge the gap between wounding and definitive care. Reports on the epidemiology of pediatric care at Role 3 (R3) Combat Support Hospitals (CSHs) have noted that 10% of bed-days are for children (3–5). To date, the description of care provided to children at R2 has been limited to small case series.

To prepare medical providers for deployments, the military frequently employs "just-in-time" training to refresh certain skills necessary to optimize medical and surgical care in the theaters of operation (6). The challenge with current predeployment training is fitting a variety of important modules into a limited amount of time (7). Additionally, pediatric training has been essentially nonexistent and relies on anecdotal sharing of lessons learned rather than a comprehensive analysis of actual patient data and translation into a training paradigm (6, 8, 9). In spite of the documented need to provide pediatric care, predeployment training inclusive of this concept is neither standardized nor required prior to deployment. The goal of this qualitative and quantitative analysis of pediatric care provided at R2 MTFs is to provide a comprehensive "needs assessment" to inform future training and educational objectives. Using Kern's six-step approach to curriculum development, the descriptive analysis provided in this study will serve as the "problem identification and needs assessment." (10) This will facilitate a targeted needs assessment of providers which will be the basis for developing goals and objectives. Our hypothesis is that this methodology will enable the design of a data-driven, high-fidelity simulation training curriculum focusing on the management of pediatric patients in the combat zone.

METHODS

This is a retrospective cohort analysis of data compiled from the Joint Trauma System (JTS) R2 Database (R2DB) on pediatric patients (< 18 yr) admitted to R2 facilities in Afghanistan from 2008 to 2014. Patients age greater than 18 years, those without age documentation, and those with "estimated ages" assigned by providers were excluded from this review. Previously described in whole by Mann-Salinas et al (11), the R2DB is an electronic database containing demographic, epidemiologic, and clinical data collected as a voluntary sample of R2 locations ($n = 28$) from traumatically wounded patients. This database contains information beginning at point of injury through discharge from a R2 MTF (11). We defined "prehospital" as the time interval from point of injury to initial arrival and entry at a R2 MTF. Nontrauma care was not recorded. Data queried included demographic data (age, gender), injury characteristics (mechanism and type of injury, admission diagnoses, Revised Trauma Score [RTS], Pediatric Trauma BIG Score [base deficit + (2.5 × international normalized ratio) + (15 − Glasgow Coma Scale [GCS])]), vital signs, laboratory values (hematocrit, hemoglobin, international normalized ratio, base deficit), prehospital management (crystalloids administered, assisted respiratory rate, tourniquet use, c-collar placement, reintubation), R2 medical management (surgery, massive transfusion protocol activation, IV fluids and blood/blood product administration), and complications (12). Traumatic brain injury (TBI) was defined as those with a head injury with any documented altered mental status. Life-saving surgery was defined as any procedure that, if not performed, the patient would have died. Anemia was defined as stabilized blood loss with hemoglobin less than 8 g/dL. See the R2R study and R2DB user guide for all clinical definitions (11, 13).

Three study groups based on age were determined in order to correspond to commercially available simulation models and existing civilian courses such as Pediatric Advanced Life Support: group 1: less than 1 year, group 2: 1–8 years, group 3: greater than 8 years. The groups were analyzed according to demographic data and were further substratified based on point of injury care, prehospital management, and medical/surgical management at the R2 MTF. Descriptive statistics were employed to define demographic and epidemiologic characteristics of the cohort. A p value of less than 0.05 was considered statistically significant. This study was approved by the U.S. Army Institute of Surgical Research Regulatory Compliance Division.

RESULTS

Of 15,404 patients included in the R2DB, 1,318 pediatric subjects (8.5%) were identified (**Fig. 1**). Four hundred seventy-eight patients cared for at a R2 MTF were not included in this R2DB query due to a lack of age documentation.

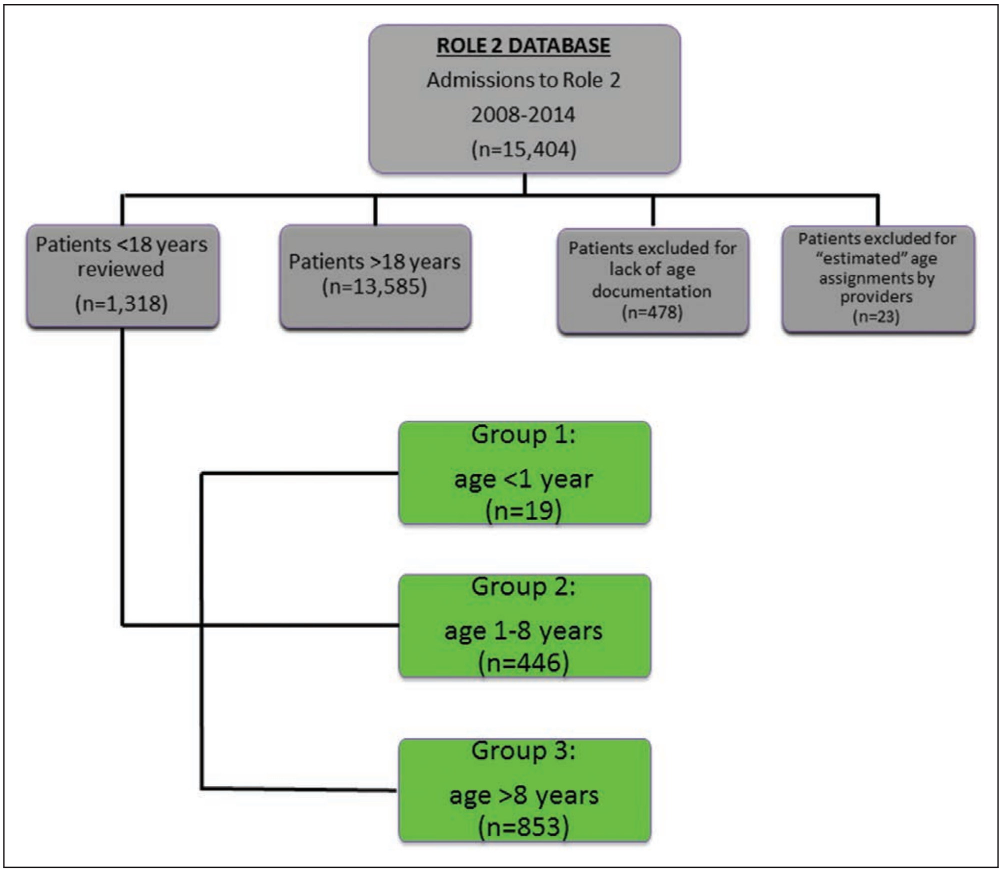

Figure 1. Study flowchart.

Twenty-three additional subjects in the R2DB were excluded from our study due to receiving "estimated age" assignments by providers in the field as opposed to cataloguing a stated age by the patient or caregiver. Patients' demographic and injury characteristics are outlined in **Table 1**. The majority of patients in this cohort were male (80.0%) with a mean age of 9.5 years (± SD, 4.5). The leading primary type of injury was penetrating (56%), followed by blunt (33%), and burn (7%). No difference in transport time from point of injury to R2 MTF (combining both aeromedical or ground resource utilization) for the three groups was found with an overall mean of 198 minutes (± 24.5 min) (p = 0.67). The lapsed aeromedical time from point of injury to arrival at a R2 MTF was a mean of 202 minutes (± 431 min), median 117 minutes (interquartile range [IQR], 60–219 min) (n = 317 patients). The ground transport times were mean 134 minutes (±119 min), median 88 minutes (IQR, 47–178 min) (n = 177 patients). Only 15% (n = 12) were transported in under 60 minutes. The mean GCS and RTS were 14 (± 0.1) and 7.0 (± 1.4), respectively. Prehospital management of patients is displayed in **Table 2**. Medical management and surgical interventions are catalogued in **Table 3**. The mean BIG Score calculated was 10.8 (n = 325 complete data). RTS calculated was 7.0 (n = 823 complete data). Overall mortality was 4% (n = 58). Clinical complications identified during the course of the R2 MTF care are illustrated in **Table 4**.

Group 1 (n = 19) formed only 1.4% of the study population. Of these subjects, 68% were male with mean (± SD) age of 0.4 years (± 0.08 yr). Demographic and prehospital information is displayed in Tables 1 and 2, respectively. With concern to mechanism of injury, group 1 demonstrated a significantly greater percentage of burns compared with the other groups (15.8%; $p < 0.01$) (Table 1). This group was also most likely to receive colloid infusions (10.5%; $p < 0.01$) (Table 2). Mortality in this group was 10.5% (n = 2). Both subjects who died suffered from gunshot/penetrating wounds (Table 1).

Group 2 accounted for 446 patients (33.8% of the study population). Sixty six percent were male. The mean age was 4.8 years (± 0.1 yr). Demographic and prehospital information is displayed in Tables 1 and 2, respectively. Group 2 showed a greater percentage of blunt trauma victims ($p < 0.05$) compared with the remainder population. Correspondingly, group 2 subjects demonstrated a significant trend for either TBI ($p < 0.01$) or skull fracture ($p < 0.01$) compared with the other groups. Mortality was 4.7% (n = 21). Of those who died in this group, the initial diagnoses were TBI (n = 9, 43%), penetrating injury (n = 6, 29%) (gunshot wound), burn (n = 5, 24%), and respiratory failure (n = 1, 5%) (not significant).

Group 3 was the largest group and accounted for 64.7% of the population. Male gender was predominant (86.6%), and the mean age was 12.1 years (±0.1 yr). Demographic and prehospital information is displayed in Tables 1 and 2, respectively. The members of group 3 were most likely to be treated for battle injury ($p < 0.01$) and suffered from a significantly greater percentage of penetrating wounds ($p < 0.01$) compared with the rest of cohort. In addition to penetrating traumas or battle injuries, group 3 subjects were significantly more likely to require in-field tourniquet placement ($p < 0.01$). A significantly greater percentage of group 3 members required resuscitation including crystalloids ($p < 0.01$), packed RBCs ($p < 0.01$), or plasma ($p < 0.01$). There was no significant difference among the groups receiving fresh whole blood or facility massive transfusion protocol activation. Group 3 subjects required both a greater percentage of orthopedic procedures ($p < 0.01$) and life-saving surgical interventions ($p < 0.01$). Group 3 subjects also exhibited a significantly greater

TABLE 1. Patient Demographics Including Diagnoses Associated With Mortality for the Entire Cohort With Subcohorts Analyzed by Age

Variable	Overall	Study Group < 1 yr	Study Group 1–8 yr	Study Group > 8 yr	p
Number of patients, *n* (%)	1,318 (100.0)	19 (1.4)	446 (33.8)	853 (64.7)	
Age, mean (SD), yr	9.5 (4.5)	0.4 (0.5)	4.9 (2.2)	12.2 (2.9)	
Gender, male, *n* (%)	1,050 (80.0)	13 (68.4)	298 (66.8)	739 (86.6)	0.0001
Primary type of injury, *n* (%)					
Penetrating	739 (56.0)	7 (36.8)	178 (39.9)	554 (64.9)	< 0.0001
Blunt	432 (33.0)	7 (36.8)	170 (38.1)	255 (29.9)	0.01
Burn	87 (7.0)	3 (15.8)	53 (11.9)	31 (3.6)	< 0.0001
Other/unknown	60 (4.6)	2 (10.5)	45 (10.1)	13 (1.5)	NS
Time, mean (SD), min					
Injury to arrival *n* (SD), *n* = 494	198 (24.5)	116.8 (30.8)	184.3 (23.3)	207.5 (23.9)	NS
Battle injury, *n* (%)	638 (48.0)	9 (47.4)	155 (34.8)	474 (55.6)	< 0.0001
BIG Score, mean (SD), *n* = 325	10.8 (7.3)	17.3 (5.2)	11.5 (0.8)	10.4 (0.5)	NS
Revised Trauma Score, mean (SD), *n* = 823	7.0 (1.4)	7.3 (0.7)	7.1 (1.3)	7.0 (1.5)	NS
Glasgow Coma Scale, mean (SD)	14 (3.2)	12 (1.3)	13 (0.2)	14 (0.1)	NS
Final disposition, *n* (%)					
Deceased, overall	58 (4.0)	2 (10.5)	21 (4.7)	35 (4.1)	NS
Primary diagnoses of mortality, *n* (% of deceased by group)					
Burn	11 (18.9)	2 (10.5)	5 (23.8)	4 (11.4)	NS
Traumatic brain injury	17 (29.3)	0 (0.0)	9 (42.8)	8 (22.8)	NS
Penetrating injury (gunshot)	20 (34.4)	0 (0.0)	6 (28.5)	14 (40.0)	NS
Respiratory failure	1 (1.7)	0 (0.0)	1 (4.7)	0 (0.0)	NS
Blunt injury	5 (8.6)	0 (0.0)	0 (0.0)	5 (14.2)	NS
Improvised explosive devices	2 (3.4)	0 (0.0)	0 (0.0)	2 (5.7)	NS
Drowning	1 (1.7)	0 (0.0)	0 (0.0)	1 (2.8)	NS
Snakebite	1 (1.7)	0 (0.0)	0 (0.0)	1 (2.8)	NS

NS = not significant.

BIG Score was calculated as using base deficit, international normalized ratio and Glasgow Coma Scale. The *p* values were calculated with the use of a chi-square or Fisher exact test where appropriate. Note: “23 patients were excluded from the Role 2 Database due to receiving” estimated age assignments by providers in the field.

percentage of patients developing with anemia compared with the other groups ($p < 0.01$). Finally, overall mortality in this group was 4% ($n = 35$) (Table 1). Of those who died in this study group, initial diagnoses included penetrating injury (40%, $n = 14$), TBI (23%, $n = 8$), blunt injury (14%, $n = 5$), burns (11%, $n = 4$), improvised explosive devices (IEDs) (6%, $n = 2$), drowning (3%, $n = 1$), and snakebite (3%, $n = 1$) (not significant).

DISCUSSION

This is the first multicenter review of pediatric combat casualty care provided at R2 facilities collated into a single database. Injuries were significant for a higher proportion of burns in infants, TBI in children 1–8 years, and penetrating injuries in older children. These epidemiologic data “identify the problem” and serve as a general needs assessment for training needs for deploying providers at these facilities. Previously, there have been several analyses of pediatric care at individual R2 facilities which were also limited because the comparatively short time period of the analysis (19–28). Our investigation stands apart due to its larger sample size and longer duration of examination, thus producing a more robust dataset to help inform training.

In the oldest subpopulation, group 3, a significant majority of pediatric injuries were due to battle ($p < 0.05$). Furthermore, group 3 suffered a higher rate of injury due to penetrating

TABLE 2. Prehospital Management of Pediatric Patients in the Combat Zone Prior to Admission at Role 2

Variable	Overall	Study Group < 1 yr	1–8 yr	> 8 yr	p
Number of patients, *n* (%)	1,318 (100.0)	19 (1.4)	446 (33.8)	853 (64.7)	
Prehospital procedures, *n* (%)					
Assisted respirations	86 (6.5)	4 (21.1)	33 (7.4)	49 (5.7)	0.018
Tourniquet	101 (7.7)	1 (5.3)	12 (2.7)	88 (10.3)	< 0.0001
C-collar placed	276 (20.9)	1 (5.3)	88 (19.7)	187 (21.9)	Not significant
Crystalloids	52 (3.9)	2 (10.5)	10 (2.2)	40 (4.7)	0.03

The *p* values were calculated with the use of a chi-square test.

TABLE 3. Medical and Surgical Care Employed for the Study Patients by Type and Frequencies

Variable	Overall	Study Group < 1 yr	1–8 yr	> 8 yr	p
Number of patients, *n* (%)	1,318 (100.0)	19 (1.4)	446 (33.8)	853 (64.7)	
Interventions in first 24 hr, *n* (%)					
Reintubation 24 hr	3 (0.2)	0 (0)	1 (0.2)	2 (0.2)	NS
Crystalloid	928 (70.4)	9 (47.4)	278 (62.3)	641 (75)	< 0.0001
Colloid	37 (2.8)	1 (5.3)	3 (0.7)	33 (4)	0.003
Packed RBCs	245 (18.6)	2 (10.5)	57 (12.8)	186 (22)	0.0003
Plasma	95 (7.2)	1 (5.3)	9 (2.0)	85 (10)	< 0.0001
Whole blood	21 (1.6)	0 (0)	3 (0.7)	18 (2)	NS
Massive transfusion	15 (1.1)	0 (0)	2 (0.4)	13 (2)	NS
Surgical procedures, *n* (%)					
Laparotomy	161 (12.2)	0 (0)	47 (10.5)	114 (14)	NS
Neurosurgery	8 (0.6)	1 (5.3)	4 (0.9)	3 (0.3)	0.02
Orthopedic	211 (16.0)	0 (0)	54 (12.1)	157 (19)	0.004
Life-saving surgery	221 (16.8)	3 (15.8)	52 (11.7)	166 (19)	0.002
Patients requiring surgery	424 (32.1)	4(21.1)	117 (26.2)	303 (36)	0.002

24 hr = provided within the first 24 hr of hospital stay, NS = not significant.
The *p* values were calculated with the use of a chi-square or Fisher exact test.

mechanisms than the rest of the study population ($p < 0.05$). Similar to Role 3 populations studied separately by Coppola and Edwards (14–16), penetrating traumas as a result of IEDs comprised the greatest type of injuries at the R2 MTF. Children have previously been described as being at greater risk of falling victim to landmines or IEDs, and our study demonstrates that children admitted to R2 MTFs require a similar type of care (17, 18).

Twenty percent of R2 pediatric patients suffered from TBI. In group 2, of the 5% of patients who suffered from TBI, 18% were due to motor vehicle crash. This is likely multifactorial and potentially secondary to poor condition of third-world roadways and lack of basic child motor vehicle safety restraints (19, 20). Notably, 43% ($n = 9$) of group 2 fatalities were related to TBI. Of these group 2 subjects with TBI who died, the average GCS was 6 (range, 3–12), demonstrating the severity of these injuries presenting at austere surgical facilities which has been previously described (21).

In recent military literature, burns comprise a large percentage of pediatric admissions (22). We also found that burns are more common in younger patients (age, 0–8 years), though this was a small group.

TABLE 4. Clinical Complications Identified During the Course of the Role 2 Medical Treatment Facilities Care

Variable	Overall	Study Group < 1 yr	1–8 yr	> 8 yr	p
Number of patients, *n* (%)	1,318 (100.0)	19 (1.4)	446 (33.8)	853 (64.7)	
Clinical problem, *n* (%)					
Anemia	60 (4.5)	1 (5.3)	9 (2.0)	50 (5.9)	0.007
Extremity compartment syndrome	10 (0.7)	0 (0)	2 (0.4)	8 (0.9)	NS
Abdomen compartment syndrome	1 (0.1)	0 (0)	1 (0.2)	0 (0)	NS
Cellulitis	1 (0.1)	0 (0)	0 (0)	1 (0.1)	NS
Hemothorax	4 (0.3)	0 (0)	0 (0)	4 (0.5)	NS
Hypothermia	98 (7.4)	3 (15.8)	27 (6.1)	68 (8.0)	NS
Hypovolemia	31 (2.3)	0 (0)	6 (1.3)	25 (2.9)	NS
Pleural effusion	1 (0.1)	0 (0)	0 (0)	1 (0.1)	NS
Acute neurologic change	22 (1.7)	0 (0)	11 (2.5)	11 (1.3)	NS
Seizure	4 (0.3)	1 (5.3)	2 (0.4)	1 (0.1)	0.0002
Shock	22 (1.7)	0 (0)	9 (2.0)	13 (1.5)	NS
Acute respiratory distress syndrome	3 (0.2)	0 (0)	2 (0.4)	1 (0.1)	NS
Cardiopulmonary resuscitation	16 (1.2)	2 (10.5)	3(0.7)	11 (1.3)	0.0006
Arrhythmia	3 (0.2)	0 (0)	2 (0.4)	1 (0.1)	NS
Respiratory failure	11 (0.8)	0 (0)	4 (0.9)	7 (0.8)	NS
None	1,075 (81.6)	14 (73.7)	364 (81.6)	697 (81.7)	NS

NS = not significant.

The *p* values were calculated with the use of a chi-square or Fisher exact test.

Due to the asymmetric nature of modern warfare, villages and civilian populations tend to run parallel to lines of battle (23, 24). The average transport time of a pediatric patient from point of injury to R2 MTF is longer when compared with transport durations of active service members. Kotwal et al (25) previously described the prehospital helicopter transport time to definitive surgical care (either R2 FST or R3 CSH) for U.S. military casualties in Afghanistan: mean = 66 ± 103.6 minutes, median = 43 minutes (IQR, 29–57 min). By comparison, the R2DB demonstrated that the lapsed aeromedical time from point of injury to arrival at a R2 MTF was much greater for pediatric patients. This further highlights the importance of pediatric predeployment training for evacuation personnel, specifically to cover en route pediatric care. Factors that contribute to longer transport time required for aeromedical transport of local pediatric casualties include evolving tactical situations that determine the flow of patient care and may preclude the transport of civilians, lack of adequate, safe transportation by victims' families, absence of dedicated evacuation assets, delaying of care by parents and families following an injury, and initiating of treatment of these pediatric patients at civilian facilities prior to transport. In comparison, the documented pediatric lapsed ground time from point of injury to R2 MTF for casualties calculated was less than the aeromedical duration. Prolonged pediatric transport times have the potential to delay definitive care for traumatic injuries and may require further point of care management by on-site providers. This may indirectly indicate the need for further predeployment training of medical providers in the care and transport of the traumatically wounded child.

The pediatric mortality observed upon discharge at R2 was 4% ($n = 58$). Of those, the predominant injury associated with mortality was TBI, 29% ($n = 17$). We were unable to examine the severity of injury for the entire database. While Injury Severity Score was not recorded in our population, the mean BIG Score for 325 patients with all data elements was 10.8 (Table 1). Of those who had BIG Score calculated, the mortality was 4.9% ($n = 16$) compared with the BIG Score predicted mortality of 4.5% ($n = 60$); however, this comparison cannot be extrapolated to the overall cohort given the potential nonrandom nature of the missing data elements (12). For the patients with a calculated RTS, the overall mortality was 1.0% ($n = 12$), slightly higher than the predicted mortality for an RTS of 7.0 of approximately 3.1% (26). Again, given the missing data elements, no overall conclusions should be made based off of these numbers. As a point of reference, pediatric mortality rates of Role 3 facilities listed by Borgman et al (5, 27) were 5.8% and 6.9%, respectively. As a reference, pediatric civilian trauma centers in the United States have reported mortality around 2.7% (28).

Management of older children was more likely to include tourniquet use as well as fluid resuscitation, demonstrated by higher use of crystalloids, plasma, and packed RBCs within the first 24 hours of admission ($p < 0.05$). Group 3 also required the largest percentage of MTF massive transfusion activations (2%, $n = 13$). This reflects injuries from blast and penetrating trauma and is similar to what is seen in the adult combat casualty literature (8, 29).

Unlike the broader capabilities of a Role 3 MTF, R2 embedded forward surgical elements are significantly smaller and may consist of one to three general surgeons, zero to two orthopedic surgeons, one to two nurse anesthetists, zero to two operating room nurses, and zero to three operating room technicians, and sometimes a primary care or emergency department physician, along with a variable number of emergency medical technician-trained medics or corpsman (30-32). Frequently, these FSTs are split into smaller elements in order to have surgical capabilities as close to the point of injury as possible. In our 4-year study, 32% ($n = 424$) of children treated underwent a surgical procedure at a R2 MTF. Of these, older subjects were more likely to require surgery ($p < 0.01$). This does not take into account the unknown number of patients transferred to R3 for surgical intervention due to R2 limitations (e.g., provider or equipment). These results can inform the future preparedness for the surgical care of children in the combat zone.

There were significant variations by age regarding nonsurgical care. Older children were more likely to exhibit anemia during care compared with the rest of the population in the study ($p < 0.01$). It is noteworthy to state that infants were more likely to have in-facility seizures ($p < 0.01$) and require cardiopulmonary resuscitation ($p < 0.05$) during admission. This underscores the importance of pediatric advanced life support at R2 facilities.

This analysis demonstrates the continued need for predeployment training and knowledge of the JTS Clinical Practice Guidelines. In particular, knowledge, skills, and attributes concerning the management of pediatric head injuries, burns, penetrating injury, and damage control resuscitation principles appear critical to providers at the R2 location (33–37). This R2 study will allow our team to develop predeployment simulations and core knowledge topics with the intent to improve our medical practices for current and future engagements. We would suggest that these simulations and concepts would inform a course for providers in the predeployment phase for those that may encounter pediatric casualties. While concepts are similar for adult and pediatric trauma victims, immersive simulation training could significantly improve confidence for those without pediatric experience. Additionally, for psychomotor skills that are unique in small children (e.g., chest tubes, venous access, airways), a rotation in a pediatric trauma center would be ideal. This training model would also be appropriate for providers caring for children in a noncombat environment but who still occasionally encounter pediatric victims, such as adult trauma centers or those going on mission to care for pediatric trauma in humanitarian settings in austere environments. We would also suggest that immersive simulations should closely approximate scenarios that providers will encounter based on epidemiologic reviews to maximize training effectiveness. Although it may be helpful to have these concepts or courses integrated into graduate medical training programs, these skills and confidence degrade over time so a "just-in-time" or "predeployment" training model, if feasible, would be ideal.

There were several limitations in this study. Foremost among this study's limitations is the fact that the R2DB has not been validated through systematic review with comparison to patient records. In addition, the voluntary nature of the R2DB data entry served as a multifactorial limitation including: data entry was performed by clinical staff who were not trained in data abstraction, injury coding or registry management, and data entry was voluntary and self-reported. There was potentially a reporting bias of diagnoses, so the true frequencies cannot be known. By extension, the R2DB was designed to describe adult casualties, and unfortunately does not include patient weights. Although this would have enhanced our analysis of pediatric trauma and would have allowed us to capture more patients with missing ages, it was not the primary purpose of the R2DB to provide description of pediatric injuries and the care rendered. The R2DB only contains information concerning traumatic injuries. The primary injury mechanism was not recorded in 4.6% of patients. Additionally, cause of death was not captured in this database. Furthermore, the inherent, demonstrable difference between the R2DB and Department of Defense Trauma Registry in terms of validation should compel readers to interpret any conclusions drawn from R2DB with caution (11, 23). The small sample size of group 1 ($n = 19$) limited making conclusions on this younger group. Selection bias is a final, significant limitation of this study. Not all injured children in Afghanistan were cared for at R2 MTFs due to Medical Rules of Engagement and a limited access to care. Thus, our R2DB analysis should not be interpreted as a true cross sectional analysis of all injuries in this population. Despite the limitations of the R2DB, these broad generalizations of age stratifications were vital to inform our dedicated simulations for real-world application. In the future, the study results will be linked with data describing Role 3 pediatric casualty care in order to better elucidate training needs.

CONCLUSIONS

U.S. military operations in Afghanistan since 2008 demonstrate the volume and significance of pediatric trauma care in the combat zone. We have described the spectrum of pediatric injuries admitted to R2 facilities. Given this analysis, we have concluded that predeployment training should include concepts unique to the pediatric trauma patient (e.g., anatomic and physiologic variations from adults), skills related to pediatric trauma (e.g., pediatric/infant intubation, intraosseous line placement, chest tube insertion), and attitudes (e.g., confidence in managing the care of traumatically injured children). This study has functioned primarily as a needs assessment to fulfill the initial steps integral to the Kern Model for curriculum building. Further implementation will focus on the creation of high-fidelity human patient simulation scenarios and didactics to enhance core concepts for the traumatic care of pediatric casualties. These scenarios can both aid in targeted needs assessment for individuals and serve as part of an overall educational strategy. Finally, this use of retrospective analysis as a needs assessment to inform and develop high-fidelity models for medical training represents a model that can be applied elsewhere in expeditionary and austere military medicine.

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En Route Critical Care Transfer From a Role 2 to a Role 3 Medical Treatment Facility in Afghanistan

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Background En route care is the transfer of patients requiring combat casualty care within the US military evacuation system. No reports have been published about en route care of patients during transfer from a forward surgical facility (role 2) to a combat support hospital (role 3) for comprehensive care.

Objective To describe patients transferred from a role 2 to a role 3 US military treatment facility in Afghanistan.

Methods A retrospective review of data from the Joint Trauma System Role 2 Database was conducted. Patient characteristics were described by en route care medical attendants.

Results More than one-fourth of patients were intubated at transfer (26.9%), although at transfer fewer than 10% of patients had a base deficit of more than 5 (3.5%), a pH of less than 7.3 (5.2%), an international normalized ratio of more than 2 (0.8%), or temporary abdominal or chest closure (7.4%). The en route care medical attendant was most often a nurse (35.5%), followed by technicians (14.1%) and physicians (10.0%). Most patients (75.3%) were transported by medical evacuation (on rotary-wing aircraft).

Conclusion This is the first comprehensive review of patients transported from a forward surgical facility to a more robust combat support hospital in Afghanistan. Understanding the epidemiology of these patients will inform provider training and the appropriate skill mix for the transfer of postsurgical patients within a combat setting. (*Critical Care Nurse*. 2018;38[2]:e7-e15)

Since the early 19th century, war fighters have recognized the benefit of early stabilization and rapid transport of people injured on the battlefield. However, the extensive use of forward surgical teams and support hospitals in the theater of war has evolved only recently during the conflicts in Iraq and Afghanistan.[1,2] Combat casualty care occurs across a continuum within the US military evacuation system, from point of injury to initial resuscitation and surgery, in and between military medical treatment facilities (MTFs), and ultimately to US-based facilities for definitive care and rehabilitation. The continuum of care consists of roles of care that are typically defined by capability: Role 1 is on-scene

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care and includes basic and advanced first aid (eg, tourniquet application, fracture stabilization, and application of sterile dressings); role 1 may also include a battalion aid station, where a physician assistant or physician may initiate resuscitation, airway management, or other nonsurgical lifesaving interventions before transfer; role 2 MTFs may be fixed or mobile facilities used for immediate resuscitation and surgical stabilization; role 3 combat support hospitals have multiple surgical specialties and intensive care; role 4 MTFs provide the full spectrum of trauma care at fixed facilities outside of the United States, and include definitive care hospitals in the United States.[3,4] Prehospital care of the injured also continues during transport from point to point on the continuum of care; ideally the care during transport will maintain the same level of care as the sending facility when moving to higher levels of care.

Of patients transported from role 2 to role 3, most patients were attended by a nurse.

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Transport platforms in the US combat theater in Afghanistan included ground and air evacuation. The 2 primary US rotary-wing (helicopter) medical evacuation platforms included the Army air ambulance and the Air Force pararescue squadron. The fixed-wing (airplane) platform was used by US Air Force Critical Care Air Transport Teams (CCATTs) and medical evacuation teams, who transported patients within the theater of war from role 2 to role 3 MTFs, as well as out of the theater to role 4 facilities. In the CCATT, physicians and nurses are assigned to this evacuation platform, whereas traditional Army rotary-wing medical evacuation does not have assigned physicians or nurses. However, in 2010, critical care nurses were assigned routinely to the US Army's medical evacuation companies to provide transport of critically ill and postoperative patients. Air Force medical evacuation (fixed-wing) teams include registered nurses; from 2010 through 2012, dedicated critical care transport was available through Air Force medical evacuation (fixed-wing) teams that included critical care flight paramedics. From 2011 through 2013, the Air Force rotary-wing tactical combat en route transportation teams were also deployed with critical care capabilities to support transfer patients from role 2 to role 3 MTFs. The level of provider varied depending on the platform and personnel availability, from basic emergency medical technician (EMT) to critical care flight paramedic to a team with physicians and critical care nurses.[5]

Rapid evacuation is essential in a combat environment after damage control resuscitation and damage control surgery in an austere role 2 surgical facility.[3] The goal of damage control efforts is to control hemorrhage and prevent or correct hypothermia, acidosis, and coagulopathy. Treatments may include advanced hemorrhage control, decompression of pneumothorax, advanced airway management, and surgery. The goal is to transport these patients to a role 3 or higher level of care as soon as they are clinically stable, ideally within 4 to 8 hours, but patients may be held at the role 2 facility as long as 72 hours. Patients may or may not be stable and may require en route critical care, presenting a unique challenge to the en route care provider.[3] The benefits of tactical combat casualty care focusing on treatment at the point of injury and during tactical evacuation have been well described.[6-10] A similar emphasis on improvements in en route care after initial care at a role 2 MTF also may promote survival.

Research has been conducted on many aspects of combat casualty care, but information is limited about the role 2 patient population and the transport of patients from a role 2 to a role 3 facility. No reports have been published about en route care of patients from a role 2 to a role 3 MTF. The purpose of this study was to describe patients transferred from a role 2 MTF to a US role 3 MTF in Afghanistan, as a first step in understanding this patient population and the skill level of medical attendants, with the goal of gaining data about best practices for en route care.

Methods

Approval for this exempt research study was received from the US Army Institute of Surgical Research Regulatory Department. This study consisted of a retrospective review of data from the Joint Trauma System Role 2 Database. The database included prehospital data, arrival and discharge status, diagnoses, interventions, blood administration, and complications data.[11] In the Role 2 Database, 15310 patient records were available. Of those records, 4534 patients were eligible (ie, these patients had transportation data available from a role 2 to a role 3 facility) for the study.

Study Inclusion Criteria

To be included in the study, patients had to have (1) been injured in Afghanistan; (2) been at least 18 years of age; (3) sustained trauma (ie, battle or nonbattle injury); (4) been injured between February 2008 and September 2014; and (5) received treatment at a role 2 MTF and been transferred to a US role 3 MTF.

Definitions

In this study, the term *en route medical attendant* was defined as the medical attendant (ie, physician, registered nurse, medical technician) with the highest clinical capability. *Medical technician* refers to an EMT or a paramedic. Patient affiliation was classified as (1) military, US (US Army, US Air Force, US Marine Corps, and US Navy); (2) military, non-US (Afghanistan police, Afghanistan military, NATO (North Atlantic Treaty Organization) coalition, combatants, and non-NATO coalition); and (3) civilian or unknown (Afghanistan civilian, contractor, non-US civilian, US civilian, and other). Mode of transfer out of a role 2 to a role 3 included medical evacuation by fixed wing, rotary wing, and ground transportation; and nonmedical evacuation by rotary-wing and ground transportation.

Injury and Intervention Categories

Using the methods of a previous study by Ingalls and colleagues,[12] patient diagnoses were categorized as orthopedic injuries, soft tissue trauma, penetrating extremity injuries, brain injuries, penetrating injuries, gastrointestinal/abdominal injuries, ears/nose/mouth/teeth/throat injuries, pulmonary/thoracic injuries, vascular injuries, genitourinary/renal injuries, burns, or other injuries. In addition, orthopedic injuries were divided into more specific categories: fracture, amputation, and other injuries. Penetrating injuries were classified according to body region: extremity or other. *Battle injury* included patients who were injured during hostile actions or battle-related activities, whereas *nonbattle injury* included nonbattle-related activities or hostile action and unintentional or self-inflicted injuries.

Blood transfusion at a role 2 MTF was defined as receiving any blood product (ie, whole blood, packed red blood cells, platelets, cryoprecipitate, or plasma/fresh frozen plasma), whereas massive transfusion at a role 2 MTF was defined as receiving more than 10 U of packed red blood cells within 24 hours. Surgery at a role 2 facility was identified by categorizing procedure descriptions into surgical (eg, bowel surgery, amputation) or nonsurgical procedures (eg, computed tomography scan, radiograph). Shock index (ie, heart rate divided by systolic blood pressure) was used to demonstrate trauma injury severity among study patients; a shock index of ≥0.9 indicated a patient with severe to critical injuries.[13] Injury types were categorized by all burn injuries, penetrating injury, blunt injury, or penetrating and blunt injury. Mechanism of injury was categorized by all explosions, gunshot wound, motor vehicle crash, fall, and other. Patient characteristics and interventions (eg, intubation, vasopressor use, shock index) were described by the en route care medical attendant.

Deployment of much smaller teams into more austere settings results in limited resources for definitive care, longer holding times, and extended evacuation times.

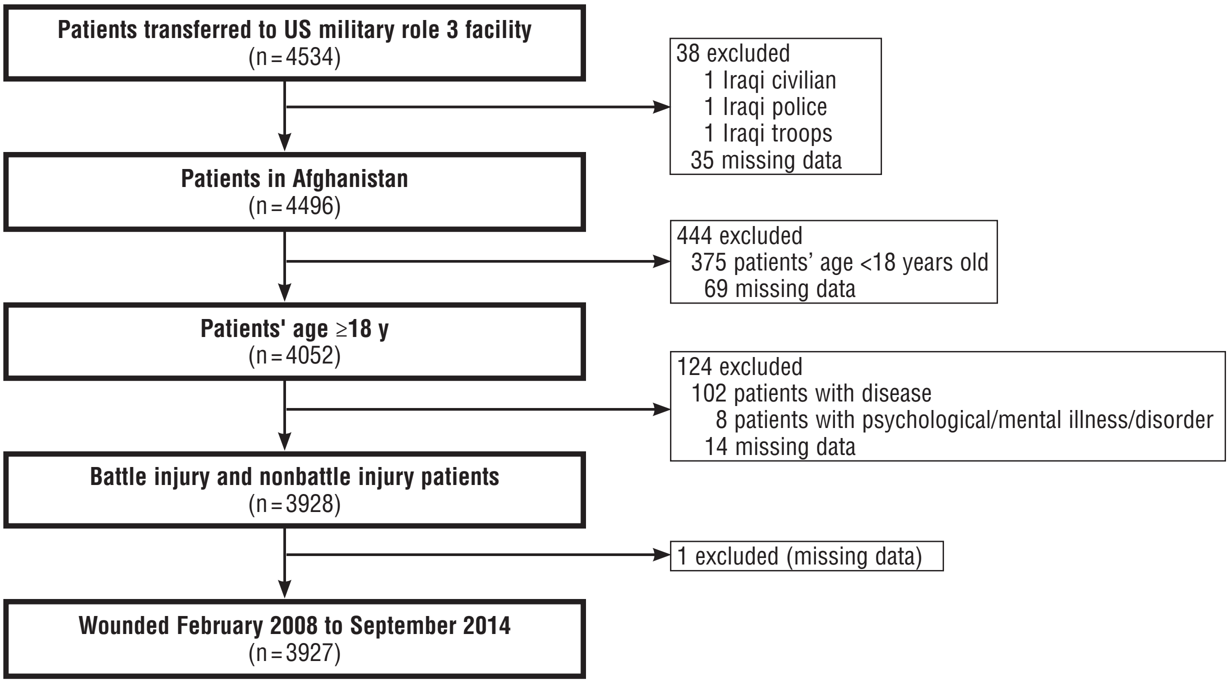

Figure Sample size of study participants (N = 3927) by inclusion/exclusion criteria, February 2008 to September 2014.

Statistical Analysis

Fisher's exact test, χ^2, or analysis of variance tests were used to determine significant differences in patient characteristics where appropriate. For the en route care medical attendant analysis, only physicians, nurses, and technicians were compared, because the unknown category was not mutually exclusive for nurses, physicians, and technicians. Analyses were performed using SAS, version 9.4 (SAS Institute, Inc).

Results

Based on the inclusion criteria, 3927 patients transferred to a US role 3 MTF were included in the study (see Figure). Study patients had a median (interquartile range) age of 25 (22-30) years; about half of the study population was US military (49.6%; n = 1949) (Table 1). Most patients were male (96.5%; n = 3791), had a battle injury (81.8%; n = 3214), were injured by an explosion (51.5%; n = 2023), had a penetrating injury (52.5%; n = 2060), or had a shock index less than 0.9 (75.8%; n = 2978). Among the study patients, 37.9% (n = 1489) had surgery at a role 2 MTF, and 24.5% (n = 963) received a blood transfusion and 4.7% (n = 183) received a massive transfusion at a role 2 MTF.

Injury diagnoses are described in Table 2 according to highest level of transport medical attendant. Orthopedic injuries made up the largest number of diagnoses (38.6%; n = 1517) for trauma-eligible adult patients treated and transferred from role 2 MTFs, followed by soft tissue trauma (23.9%; n = 938), penetrating extremity injuries (13.8%; n = 543), and brain injuries (13.3%; n = 521). After stratifying by medical attendant, the top 2 injury diagnoses remained the same (orthopedic injuries and soft tissue trauma) among all attendants, and penetrating injury and brain injuries remained in the top 5 diagnoses.

Many records (40.4%; n = 1588) did not have a defined en route care provider; about one-third of patients transferred from a role 2 to a role 3 facility had en route care provided by a nurse (35.5%; n = 1394), followed by technicians (14.1%; n = 554) and physicians (10.0%; n = 391; Table 3). More than one-fourth of patients were intubated at transfer (26.9%; n = 1056) and more of these patients were transported by physicians (38.9%; 152 of 391) or nurses (39.7%; 553 of 1394) than by technicians (7.2%; 40 of 554; $P < .001$). Patients transported with vasopressors differed significantly by en route medical attendant capability (physicians, 3.8% [15 of 391];

Table 1 Study characteristics of eligible adult trauma patients (N = 3927)[a] treated and transferred from role 2 medical treatment facilities during Afghanistan conflict from February 2008 to September 2014

Characteristics	No. (%)
Male sex	3791 (96.5)
Battle injury	3214 (81.8)
Mechanism of injury	
Explosion	2023 (51.5)
Gunshot wound	941 (24.0)
Other	324 (8.3)
Motor vehicle crash	303 (7.7)
Fall	151 (3.8)
Type of injury	
Penetrating	2060 (52.5)
Blunt	1232 (31.4)
Penetrating and blunt	341 (8.7)
Burn	78 (2.0)
Shock index upon arrival at role 2 facility	
<0.9	2978 (75.8)
≥0.9	781 (19.9)
Patient affiliation	
US military	1949 (49.6)
Non-US military	1139 (29.0)
Civilian or unknown	839 (21.4)
Surgery at role 2 facility	
Yes	1489 (37.9)
No	838 (21.3)
Blood transfusion at role 2 facility	
Yes	963 (24.5)
No	1140 (29.0)
Massive transfusion at role 2 facility	
Yes	183 (4.7)
No	1874 (47.7)

[a] Median (interquartile range) age was 25 (22-30) years old.

nurses, 2.3% [32 of 1394]; technicians, 0.4% [2 of 554]; $P = .001$). Compared with patients transported by technicians, more patients attended by a physician or nurse had a base deficit of more than 5 at transfer (physicians, 5.1% [20 of 391]; nurses, 5.0% [70 of 1394]; technicians, 1.4% [8 of 554]; $P = .04$), pH less than 7.3 at transfer (physicians, 7.2% [28 of 391]; nurses, 7.2% [101 of 1394]; technicians, 2.7% [15 of 554]; $P = .05$), and an international normalized ratio of more than 2 at transfer (physicians, 2.3% [9 of 391]; nurses, 1.1% [16 of 1394]; technicians, 0%; $P = .03$). Fewer patients transported by technicians (3.1% [17 of 554]) had temporary abdominal or chest closure at transfer compared with physicians (8.7% [34 of 391]) or nurses (11.1% [155 of 1394]; $P < .001$). The distribution of patient mode of transportation differed by medical attendant ($P < .001$), although most patients, regardless of type of en route medical attendant, were transported by rotary-wing medical evacuation. More patients transported by physicians (4.9% [19 of 391]) or nurses (6.7% [94 of 1394]) had a massive transfusion at a role 2 facility, compared with patients transported by technicians (1.3% [7 of 554]). Technicians transported patients with lower mean (SD) pulse at departure (84.0 [16.3]) compared with physicians (92.9 [20.7]) and nurses (92.0 [21.7]; $P < .001$).

Discussion

This study represents the first detailed description of the en route care of trauma-eligible adult patients transferred from a role 2 to a role 3 MTF in Afghanistan. In this study, we compared trauma-eligible adult patients transferred from role 2 MTFs to US role 3 MTFs by en route care medical attendant capability. Of patients with a documented en route care provider, most patients were attended by a nurse. Among study patients, the top 4 diagnoses were orthopedic injury, soft tissue trauma, brain injury, and penetrating extremity injury. In this study, the physiological status of patients differed by medical attendant. Proportionally, patients attended by physicians or nurses were in worse physiological condition at transfer (ie, intubated and receving vasopressors, base deficit >5, pH <7.3, international normalized ratio >2, temporary abdominal or chest closure, or massive transfusion at role 2) than patients transported by technicians. Specifically, more than 25% of patients transferred from a role 2 were intubated, and the highest level of medical attendant at transfer was a technician for 40 of these intubated patients. A traditional EMT is not trained to care for an intubated patient. In addition, nearly 40% of study patients were postoperative patients. Although a combat-trained medic can retrieve a battle casualty from point of injury, a postoperative patient tends to require specialized care that may be outside the scope of an EMT or paramedic, necessitating a higher and specialized provider skill level.

Previous studies have identified outcomes for trauma casualties transported from point of injury to surgical capability and cared for by nonphysician providers with varying levels of training. In the study by Mabry et al,[14] among patients transported from point of injury to first MTF, mortality was lower in patients cared for by critical

Table 2 Diagnoses for eligible adult trauma patients (N = 3927) treated and transferred from role 2 medical treatment facilities during Afghanistan conflict by highest level of en route medical attendant[a] from February 2008 to September 2014

Diagnosis	Total (N = 3927) No. (%)	Physician (n = 391) No. (%)	Nurse (n = 1394) No. (%)	Technician (n = 554) No. (%)	Unknown (n = 1588) No. (%)
Orthopedic injury, total	1517 (38.6)	174 (44.5)	778 (55.8)	182 (32.9)	383 (24.1)
Fracture	1069 (27.2)	144 (36.8)	536 (38.5)	119 (21.5)	270 (17.0)
Amputation	157 (4.0)	14 (3.6)	91 (6.5)	14 (2.5)	38 (2.4)
Other injury	291 (7.4)	16 (4.1)	151 (10.8)	49 (8.8)	75 (4.7)
Soft tissue trauma	938 (23.9)	77 (19.7)	469 (33.6)	129 (23.3)	263 (16.6)
Penetrating injury, extremity	543 (13.8)	36 (9.2)	287 (20.6)	69 (12.5)	151 (9.5)
Brain injury	521 (13.3)	47 (12.0)	196 (14.1)	83 (15.0)	195 (12.3)
Other injury	275 (7.0)	44 (11.3)	135 (9.7)	24 (4.3)	72 (4.5)
Penetrating injury, other regions	221 (5.6)	21 (5.4)	116 (8.3)	23 (4.2)	61 (3.8)
Gastrointestinal/abdominal injury	193 (4.9)	24 (6.1)	109 (7.8)	12 (2.2)	48 (3.0)
Ears/nose/mouth/teeth/throat injury	138 (3.5)	14 (3.6)	77 (5.5)	12 (2.2)	35 (2.2)
Pulmonary/thoracic injury	138 (3.5)	15 (3.8)	81 (5.8)	13 (2.3)	29 (1.8)
Vascular injury	104 (2.6)	10 (2.6)	65 (4.7)	6 (1.1)	23 (1.4)
Genitourinary/renal injury	91 (2.3)	13 (3.3)	50 (3.6)	5 (0.9)	23 (1.4)
Burn injury	45 (1.1)	3 (0.8)	26 (1.9)	4 (0.7)	12 (0.8)

[a] En route medical attendant was defined as the medical attendant with the highest capability.

care flight paramedics than in patients treated by EMTs, who have a lower level of training (mortality, 8% vs 15%, respectively; $P = .011$). Dissimilarly, in a comparison of patient outcomes among EMTs, paramedics, and advanced-level providers from point of injury to first MTF (which includes physicians, physician assistants, and nurses), Maddry and colleagues[5] did not report a difference. These null findings may be due to (1) restrictions of care because of the confined space of the transport platform or (2) a minimization of the need for lifesaving en route interventions due to reduced transport times because of the golden hour policy (ie, the mandate that medical evacuation platforms must deliver causalities from point of injury to surgical capability within 1 hour of request[2]). However, transport of a relatively stable postoperative patient using a regulated system differs from the transport of a patient from the point of injury or role 1 to initial surgical care at the role 2.

Multiple studies have been conducted evaluating the en route care of patients during transport from point of injury to first MTF (role 2 and/or 3)[5,12,14-22] and out of theater to the role 4 medical center in Landstuhl, Germany.[12,19-28] A few published reports have described patients treated by individual forward surgical teams (role 2) during specific deployments, but these studies do not include information related to patient transport. These reports described cases and procedures performed by the surgical teams from data sets collected prospectively by the surgical team. The data elements compiled varied from report to report, limiting the ability to combine data.[29-38] The Joint Trauma System established its Role 2 Database in 2008; however, only 1 preliminary report using this database has described the profiles of patients treated in all role 2 facilities.[11] Ultimately, our study is the first comprehensive description of the types of trauma patients evacuated from a role 2 surgical facility to a higher level of care in a combat setting.

Limitations

Several limitations of our study must be considered along with the interpretation of study results. The data used in this study have not been validated using quality control methods, such as cross-checking the data against the patient's medical records. Another limitation is that we are unable to differentiate critical care flight paramedics, who have a higher level of training, from traditional combat flight medics, as these attendants are grouped

Table 3 Study characteristics by en route medical attendant[a] of trauma-eligible adult patients (N = 3927) treated and transferred from role 2 medical treatment facilities during Afghanistan conflict from February 2008 to September 2014

Characteristics	Total No. (%)	Physicians No. (%)	Nurses No. (%)	Technicians No. (%)	Unknown No. (%)	P[b]
Patients	3927 (100.0)	391 (10.0)	1394 (35.5)	554 (14.1)	1588 (40.4)	
Intubated at transfer						<.001
Yes	1056 (26.9)	152 (38.9)	553 (39.7)	40 (7.2)	311 (19.6)	
No	2521 (64.2)	235 (60.1)	799 (57.3)	491 (88.6)	996 (62.7)	
Receiving vasopressors at transfer						.001
Yes	64 (1.6)	15 (3.8)	32 (2.3)	2 (0.4)	15 (0.9)	
No	3426 (87.2)	369 (94.4)	1291 (92.6)	523 (94.4)	1243 (78.3)	
Base deficit > 5 at transfer						.049
Yes	138 (3.5)	20 (5.1)	70 (5.0)	8 (1.4)	40 (2.5)	
No	2467 (62.8)	299 (76.5)	1043 (74.8)	297 (53.6)	828 (52.1)	
pH < 7.3 at transfer						.05
Yes	203 (5.2)	28 (7.2)	101 (7.2)	15 (2.7)	59 (3.7)	
No	2414 (61.5)	292 (74.7)	1015 (72.8)	298 (53.8)	809 (50.9)	
INR > 2 at transfer						.03
Yes	32 (0.8)	9 (2.3)	16 (1.1)	0 (0.0)	7 (0.4)	
No	2011 (51.2)	261 (66.8)	818 (58.7)	209 (37.7)	723 (45.5)	
Temporary abdominal or chest closure at transfer						<.001
Yes	292 (7.4)	34 (8.7)	155 (11.1)	17 (3.1)	86 (5.4)	
No	2745 (69.9)	319 (81.6)	1055 (75.7)	413 (74.5)	958 (60.3)	
Mode of transfer						<.001
Medical evacuation (fixed wing)	183 (4.7)	60 (15.3)	46 (3.3)	8 (1.4)	69 (4.3)	
Critical care air transport team	80 (2.0)	39 (10.0)	15 (1.1)	1 (0.2)	25 (1.6)	
Medical evacuation (rotary wing)	2956 (75.3)	259 (66.2)	1197 (85.9)	495 (89.4)	1005 (63.3)	
Medical evacuation (ground)	34 (0.9)	1 (0.3)	5 (0.4)	11 (2.0)	17 (1.1)	
Nonmedical evacuation (air)	74 (1.9)	2 (0.5)	32 (2.3)	16 (2.9)	24 (1.5)	
Nonmedical evacuation (ground)	15 (0.4)	1 (0.3)	3 (0.2)	1 (0.2)	10 (0.6)	
Other	165 (4.2)	29 (7.4)	84 (6.0)	19 (3.4)	33 (2.1)	
Massive transfusion						<.001
Yes	183 (4.7)	19 (4.9)	94 (6.7)	7 (1.3)	63 (4)	
No	1874 (47.7)	196 (50.1)	753 (54.0)	242 (43.7)	683 (43)	
	Total Mean (SD)	**Physicians Mean (SD)**	**Nurses Mean (SD)**	**Technicians Mean (SD)**	**Unknown Mean (SD)**	P[b]
Pulse at departure, beats/min	89.1 (20.4)	92.9 (20.7)	92.0 (21.7)	84.0 (16.3)	86.9 (19.6)	<.001
Respiratory rate at departure, breaths/min	16.9 (4.1)	16.5 (3.9)	16.9 (4.3)	17.3 (4.0)	16.8 (3.9)	.17
Systolic blood pressure at departure, mm Hg	125.3 (17.9)	123.9 (19.4)	124.2 (19.0)	124.2 (15.4)	127.5 (17.0)	.98
Oxygen saturation at departure, %	98.1 (4.0)	97.5 (7.9)	98.4 (4.1)	97.8 (3.3)	98.0 (3.2)	.06

Abbreviation: INR, international normalized ratio.
[a] En route medical attendant was defined as the medical attendant with the highest capability.
[b] *P* value is a comparison between physician, nurse, and technician.

together. In addition, given that data are recorded voluntarily by health care professionals with limited training on data entry, we are unsure of the proportion of role 2 workload that has been captured. Therefore, selection bias is a possibility in this study. Finally, because of the high proportion of missing data (eg, en route care interventions, physiological status, patient outcomes), this analysis serves as only an initial evaluation of patients evacuated from role 2 to higher level of care.

Implications for Future Practice

The model of role 2 MTFs has been successful in recent conflicts in demonstrating outcomes comparable to a combat support hospital and in establishing the use of fresh whole blood in an austere setting.[39-41] However, we are reaching limits of effectiveness in terms of how much farther "forward" we can place teams or units with surgical capability.[42] Deployment of much smaller teams into more austere settings results in limited resources for definitive care, longer holding times, and extended evacuation times. This limit is important, because delays in the application or performance of definitive lifesaving interventions lead to more critically ill patients with worse outcomes.[43] Moreover, even if resources are available for placing teams and units farther forward, the geography of the combat theater may be a limiting factor, as was the case in Afghanistan compared with Iraq.[44] Consequently, in the future, improved outcomes are not only going to come from physicians, but from other health care providers who also have significant training and experience (ie, flight paramedics, critical care nurses).[42] Given our study results, we must specifically train medical attendants to care for postoperative patients, train flight paramedics in critical care, and individually assign critical care nurses to transport patients to ensure standardization of an appropriate skill level for critical care transport; these teams could be augmented by a physician assistant or physician as needed.

In addition, the traditional role 2 facility is located in an austere setting, often without an airfield capable of accommodating a fixed-wing aircraft, which may make the routine use of medical evacuation (fixed wing) or CCATTs impractical for future combat scenarios. Therefore, in future conflicts, the advantage of more highly trained providers may become more apparent if shorter patient transport times are not possible.[5]

The time frame for this study was from 2008 through 2014, and multiple changes in capabilities and resource allocation occurred during that time. Future studies may be more meaningful if they focus on a later, shorter time period when practices are more consistent. In addition, future studies need to examine the actual care provided during transport from role 2 to role 3 MTFs and include an analysis of short- and long-term outcomes based on provider skill level. The results of these studies can provide valuable information about en route care training requirements, clinical practice guidelines, and the use of resources. In addition, understanding the care needs of patients closest to the battlefield in recent conflicts may help shed light on prolonged field care scenarios.

Finally, approximately half of the study population was a non-US military member or civilian or unknown. Documentation of care provided at the role 2 and during transportation of these patients within the austere environment of the US military evacuation system is challenging but critical, because providers need to know what interventions occurred before arrival at the next level of care. Innovations in the transfer of medical information and records to host-nation treatment facilities are needed.

Conclusion

This study is the first comprehensive review of patients transported from a forward surgical facility to a more robust combat support hospital in Afghanistan. Understanding the epidemiology of these patients will inform provider training and appropriate skill mix for the transfer of postsurgical patients within a combat setting. CCN

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See also

To learn more about transfer of patient care, read "Role of Transitional Care Measures in the Prevention of Readmission After Critical Illness" by Peters in *Critical Care Nurse*, February 2017 37:e10-e17. Available at **www.ccnonline.org.**

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En Route Critical Care Transfer From a Role 2 to a Role 3 Medical Treatment Facility in Afghanistan

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Factors associated with trauma patients' length of stay at Role 2 facilities in Afghanistan, October 2009 to September 2014

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BACKGROUND: Understanding patients' length of stay at far-forward Role 2 surgical units may help to determine support needs, stabilization requirements, predeployment training, and necessity of increased care capability before or during transport to a higher level of care. The objectives of this study were to (1) evaluate the amount of time patients spent at Role 2 and (2) determine the factors associated with trauma patients' length of stay at Role 2.

METHODS: We conducted a secondary data analysis of the Joint Trauma System Role 2 Database. Logistic regression was used to determine factors associated with extended length of stay at Role 2.

RESULTS: There were 7,912 study patients, and the overall median (interquartile range) amount of time patients spent at Role 2 was 2.5 (1.2–5.5) hours. The adjusted odds ratio (aOR) of extended stay for civilian/other forces and non–US military patients were 1.2 (95% confidence interval [CI], 1.0–1.4) and 1.4 (95% CI, 1.2–1.7) times higher as compared with US military patients, respectively. The aOR of extended stay were higher for patients who received blood transfusions (aOR, 1.4; 95% CI, 1.2–1.6), surgical procedures (aOR, 1.6; 95% CI, 1.4–1.8), or did not use a tourniquet (aOR, 1.2; 95% CI, 1.0–1.5). As compared with those injured by an explosion, the adjusted odds of extended stay were 1.2 (95% CI, 1.0–1.4) times higher for patients injured by another mechanism. The odds of extended stay were lower (aOR, 0.3; 95% CI, 0.2–0.5) for patients who died and higher (aOR, 1.4; 95% CI, 1.2–1.6) for transferred patients as compared with patients who returned to duty.

CONCLUSION: In this study, interventions, patient affiliation, discharge status, and injury mechanism were associated with length of stay at Role 2. Our study results will help inform training and current Role 2 logistic and personnel support needs. (*J Trauma Acute Care Surg.* 2018;85: S140–S144. Copyright © 2018 Wolters Kluwer Health, Inc. All rights reserved.)

LEVEL OF EVIDENCE: Prognostic, level III.

KEY WORDS: Combat casualty care; time; battlefield; length of stay; role 2.

Extended length of stay (LOS) in civilian hospitals is associated with poor health outcomes, congestion in the continuum of care, and increased medical attendant workload.[1–3] The effects of extended LOS at differing roles of care on the battlefield are not known, but may also be associated with poor outcomes. On the battlefield, reasons for extended length of patient stay are inherently different from those in civilian hospitals and may include patients who are too unstable to move, limited or unavailable medical evacuation assets, inability of higher capability facilities to receive patients due to high census or shortages of medical personnel, equipment, and supplies. Therefore, results from studies on LOS in civilian hospitals are generally not applicable to the Role 2 combat casualty care setting as postoperative casualties are generally immediately transferred to the appropriate level of care after surgical stabilization.

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The primary purpose of Role 2 surgical units is to provide damage control resuscitation (DCR) and damage control resuscitation (DCS) close to the point of injury to provide stabilization before the patient transporting to definitive care. Given the limited resources and holding capacity at these small surgical units, rapid evacuation to more capable hospitals is imperative. Understanding the factors associated with extended LOS at Role 2 may help determine perioperative support needs, pretransport stabilization requirements, and required predeployment training for medical providers to positively affect outcomes; additionally, it may also identify additional capability requirements of Role 2 surgical units operating in austere environments remote from more capable Role 3 hospitals. The objectives of this study were to (1) evaluate the amount of time patients spent at Role 2 surgical units and (2) determine factors associated with trauma patients' LOS at Role 2.

PATIENTS AND METHODS

We conducted a retrospective study that analyzed patients treated in Afghanistan at Role 2s. Role 2 surgical teams are fixed or mobile facilities used to provide resuscitation and surgical stabilization (i.e., DCR, DCS, general surgery, orthopedic stabilization) of combat causalities before transfer to a higher level of medical care.[4] These units have limited bed capacity and limited capabilities beyond DCR/DCS and blood transfusion.[5,6] Once the patient is stabilized at a Role 2 surgical unit, the patient is discharged or transferred to the next higher level of care.

We used deidentified data from the Joint Trauma System Role 2 Database, which includes prehospital data, arrival/discharge status, diagnosis, interventions, blood administration, and complications data.[4] The Role 2 Database is a convenience sample of patients cared for by Role 2 surgical teams. Data are entered by clinical personnel; this differs from the Department of Defense Trauma Registry which is populated from verified source documents by trained personnel. Adult patients who were battle or non–battle-injured in Afghanistan between February 2008 and September 2014 were eligible for this study. Additional details on the eligible study population can be found in the study by Kotwal et al.[7] We included patients who stayed at Role 2s for up to 72 hours as Role 2s were designed to hold patients for this amount of time. Patients were excluded if they had missing covariate data or if they were dead on arrival at Role 2. Patients were classified as dead on arrival if they were not resuscitated or did not receive any other treatment beyond cardiopulmonary resuscitation, endotracheal tube or central line placement, focused abdominal sonography for trauma, or abdominal wound exploration in the emergency room. The dependent variable, LOS, was defined as time interval in hours from admission to discharge. LOS was categorized as standard (i.e., ≤8 hours) or extended stay (i.e., >8 hours). This time cut point was chosen because Role 2 surgical teams were designed with the intended capability of providing postoperative intensive care for critically injured patients for 6 hours[8] and the estimated mean time for surgery at Role 2 facilities was 2 hours. Role 2 emergency department times were presumed to be minimal for this analysis.

Independent variables included: blood transfusion, surgical procedures, prehospital tourniquet, patient affiliation (US military, non–US military, civilian/other), injury mechanism (explosion, gunshot, other), and discharge status (returned to duty, dead, transferred). Blood transfusion included whole blood, packed red blood cells, platelets, cryoprecipitate, or plasma received at Role 2s or prehospital. Surgical procedures were identified by reviewing the patient's record. Tourniquet use was indicated in the prehospital data elements. Patient affiliation was categorized as US Military, non–US military (including Afghan National Army and Afghanistan Police Forces) and civilians, including contractors. Injury mechanism was defined as explosion (improvised explosive devices, aerial bombs, landmines, hand grenades, explosively formed penetrator, rocket propelled grenades, improvised rocket assisted munitions, mortar rockets, or other explosives). At discharge, patients were classified as dead, transferred (e.g., Afghanistan hospital or another military facility), or returned to duty from a Role 2 (i.e., discharged, admitted for observation or follow-up, had a minor injury, or patient hold). Civilians were considered returned to duty if they were discharged home.

Median (interquartile range [IQR]) time was calculated for the study patient population overall and then by study covariates. Logistic regression was used to determine which factors were associated with the amount of time patients spent at a Role 2. The final multivariate regression model was as follows:

$$\begin{aligned}&Logit(P_{extended\ stay})\\&= b_0 + b_1\,discharge\ status + b_2\,prehospital\ tourniquet\\&+ b_3\,blood\ transfusion + b_4\,patient\ affiliation + b_5\,injury\ mechanism\\&+ {}_{b6}\,surgical\ procedure,\end{aligned}$$

where $p_{\text{extended stay}}$ equals the probability of extended stay at a Role 2. The intercept is denoted by b_0, and (b_1, b_2, …, b_6) are the beta coefficients of all linear factors. Covariates were identified using model selection. Using model selection, we identified the best fit model. Initially, we ran a full model, which included covariates used in the final model plus complications (yes, no), volume of patients (<5 patient/hour, ≥5 patients/hour), age (years), sex (male, female), injury type (penetrating, nonpenetrating), admission temperature (<97 °F, ≥97 °F), and shock index (i.e., admission heart rate/systolic blood pressure) (<0.9, ≥0.9). All covariates from the full model which were found to be significant ($p < 0.05$) were included in the reduced model. Then, nonsignificant covariates from the full model were added individually to the reduced model to check for significance.

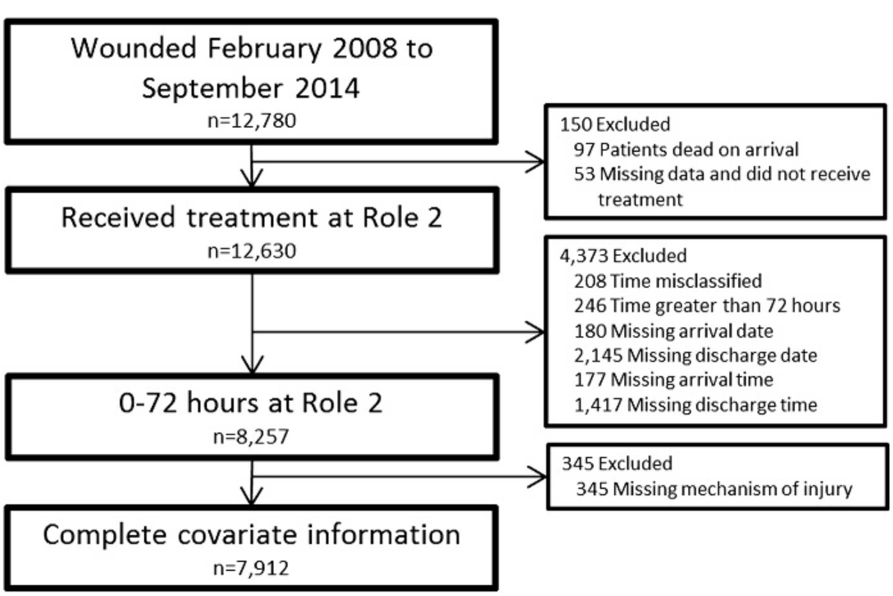

Figure 1. Flow diagram of study patients (n = 7,912) by inclusion/exclusion criteria, October 2009 to September 2014.

TABLE 1. Number and Percentage of Study Patients Treated at Role 2 Facilities in Afghanistan, October 2009 to September 2014

Variables	n	%
Total	7,912	100.0
Age: (median, IQR), y	25.0	21.0–30.0
Temperature: (median, IQR), °F	98.2	97.6–98.9
Shock index (median, IQR)	0.7	0.6–0.8
Sex		
Male	7,675	97.0
Female	177	2.2
Affiliation		
Military, US	3,023	38.2
Military, non-US	1,841	23.3
Civilian/other	3,048	38.5
Injury mechanism		
Explosion	3,972	50.2
Gunshot	1,991	25.2
Other	1,949	24.6
Injury type		
Penetrating	4,873	61.6
Nonpenetrating	2,691	34.0

None of the nonsignificant covariates became significant; therefore, these variables were not included in the final model. Besides significance testing, model fit was also determined using Hosmer-Lemeshow's goodness of fit test, Akaike information criterion value, and the pseudo R^2 value. All analyses were completed using Stata (StataCorp. 2015. Stata Statistical Software: Release 14; StataCorp LP, College Station, TX).

RESULTS

There were 12,780 patients eligible for our study. A total of 7,912 (61.9%) patients were included in the study (Fig. 1). Role 2 admission dates for these patients ranged from October 2009 to September 2014. The median age of patients was 25.0 years (IQR, 21.0–30.0), and the majority of patients were male (97.0%, n = 7,675) and members of the armed forces (US Military 38.2%, n = 3,023; non–US Military = 23.3%, n = 1,841). Most patients had a penetrating injury (61.6%, n = 4,873) and/or were injured by an explosion (50.2%, n = 3,972) (Table 1). The majority of patients stayed at Role 2 ≤ 8 hours (83.1%, n = 6,578), while 16.9% (n = 1,334) of patients had an extended stay.

Table 2 shows the difference in the amount of time spent at Role 2 by study variables. The overall median amount of time patients spent at Role 2 was 2.5 hours (IQR, 1.2–5.5 hours). US Military (median, 1.9 hours; IQR, 0.9–4.4 hours) patients spent less time at Role 2 as compared with non–US military (median, 3.1 hours; IQR, 1.5–6.4 hours) and civilian/other (median, 2.9 hours; IQR, 1.3–5.9) patients. Patients with gunshot wounds (median, 3.2 hours; IQR, 1.5–6.3) stayed at Role 2s longer than those injured by an explosion (median, 2.5 hours; IQR, 1.2–5.3). Patients who died at Role 2 spent less time (median, 0.9 hours; IQR, 0.3–2.2) at these facilities as compared with those who were transferred (median, 3.6 hours; IQR, 1.9–6.5) or returned to duty (median, 1.4; IQR, 0.8–2.9).

The relationship between patient characteristics and the odds of extended stay is shown in Table 3. After controlling for injury mechanism, interventions (i.e., procedures, tourniquet use, and blood transfusion), and discharge status, the odds ratio of extended stay for civilian/other forces and non–US military patients were 1.2 (95% confidence interval [CI], 1.0–1.4; $p = 0.018$) and 1.4 (95% CI, 1.2–1.7; $p < 0.001$) times higher as compared with US military patients, respectively. As compared with those injured by an explosion, the adjusted odds of extended stay were similar (1.0; 95% CI, 0.9–1.2; $p = 0.899$) among those with gunshot wounds and 1.2 (95% CI, 1.0–1.4; $p = 0.010$) times higher for patients injured by another mechanism of injury. The odds of extended stay varied by intervention. The adjusted odds (aOR) of extended stay were higher for patients who had surgical procedures (aOR, 1.6; 95% CI, 1.4–1.8; $p < 0.001$) or a blood transfusion (aOR, 1.4; 95% CI, 1.2–1.6; $p < 0.001$) and lower for patients who used a tourniquet (aOR, 0.8; 95% CI, 0.7–1.0; $p = 0.029$) as compared with patients who did not. As compared with patients who returned to duty, the odds of extended stay were lower (aOR, 0.3; 95% CI, 0.2–0.5; $p < 0.001$) for patients who died and higher (aOR, 1.4; 95% CI, 1.2–1.6; $p < 0.001$) for transferred patients.

DISCUSSION

The overall median LOS at Role 2 was 2.5 hours, and extended LOS longer than 8 hours was associated with interventions, patient affiliation, injury mechanism, and final patient disposition. While interventions, such as blood transfusion and surgical procedures, were associated with extended LOS, patients who did not use tourniquets had reduced odds of extended stay. This may be due to tourniquet patients

TABLE 2. Median and IQR Time Study Patients Were Treated at Role 2 Facilities in Afghanistan, October 2009 to September 2014

		Hours	
Variables	n	Median	IQR
Total	7,912	2.5	1.2–5.5
Affiliation			
Military, US	3,023	1.9	0.9–4.4
Military, non-US	1,841	3.1	1.5–6.4
Civilian/other	3,048	2.9	1.3–5.9
Injury mechanism			
Explosion	3,972	2.5	1.2–5.3
Gunshot	1,991	3.2	1.5–6.3
Other	1,949	2.0	1.0–4.8
Procedure			
No	5,081	1.8	0.9–4.1
Yes	2,831	4.0	2.3–7.2
Tourniquet use			
No	6,807	2.4	1.1–5.3
Yes	1,105	3.6	1.9–6.3
Blood transfusion			
No	6,427	2.2	1.1–4.7
Yes	1,485	4.5	2.5–7.6
Discharge status			
Returned to duty	2,852	1.4	0.8–2.9
Dead	341	0.9	0.3–2.2
Transferred	4,719	3.6	1.9–6.5

TABLE 3. OR and Corresponding 95% CI for Extended Stay in Study Patients (n = 7,912) Treated at Role 2 Facilities in Afghanistan, October 2009 to September 2014

	Unadjusted			Adjusted		
Variables	**OR**	**95% CI**	***p***	**OR**	**95% CI**	***p***
Affiliation						
Military, US	1.0	Reference		1.0	Reference	
Military, non-US	1.7	1.4–2.0	<0.001	1.4	1.2–1.7	<0.001
Civilian/other	1.4	1.2–1.6	<0.001	1.2	1.0–1.4	0.018
Injury mechanism						
Explosion	1.0	Reference		1.0	Reference	
Gunshot	1.2	1.1–1.4	0.008	1.0	0.9–1.2	0.899
Other	1.1	1.0–1.3	0.065	1.2	1.0–1.4	0.010
Procedure						
No	1.0	Reference		1.0	Reference	
Yes	1.8	1.6–2.1	<0.001	1.6	1.4–1.8	<0.001
Tourniquet use						
No	1.0	Reference		1.0	Reference	
Yes	1.1	0.9–1.3	0.354	0.8	0.7–1.0	0.029
Blood transfusion						
No	1.0	Reference		1.0	Reference	
Yes	1.7	1.5–1.9	<0.001	1.4	1.2–1.6	<0.001
Discharge status						
Returned to duty	1.0	Reference		1.0	Reference	
Dead	0.4	0.3–0.7	<0.001	0.3	0.2–0.5	<0.001
Transferred	1.7	1.5–1.9	<0.001	1.4	1.2–1.6	<0.001

having a different injury pattern (i.e., extremity injuries and no abdominal injuries) as compared with non-tourniquet patients. When compared with other patient affiliations, US military patients stayed at Role 2s for less time versus other patients. We posit a potential reason for the difference in LOS in US military versus non–US military may be limited use of body armor in host nation military members, which may have led to worse initial patient injuries. In addition, as compared with patients injured by an explosion, patients with gunshot wounds had similar odds of extended LOS, while those injured by another mechanism had greater odds of staying at Role 2s longer. Lastly, LOS varied by final patient disposition. Generally, patients, those who died at Role 2, died shortly after arriving, which supports the need for having Role 2s dispersed as close to the point of injury as possible. Among patients who lived, patients who were transferred spent more time at Role 2s as opposed to patients who returned to duty.

There is limited published literature available on the LOS for combat casualties at Role 2 and Role 3 facilities. A study by Stankorb et al.[9] set at a combat support hospital (i.e., Role 3) in Iraq reported early enteral nutrition was associated with reduced LOS. Likewise, Riha et al.[10] identified the impact of length of patient stay in combat causalities from point of injury to transfer to a US facility and found the incident rate of abdominal procedures at a regional evacuation hub (i.e., Role 4) increased 1.1 times for every day increase in pre-US LOS. Of the studies including data on patient LOS at far-forward Role 2 or similar units,[11,12] there are no comprehensive reports describing factors associated with length of patient stay at Role 2s.

This study represents the first detailed description of casualties' LOS at Role 2s in Afghanistan. At forward mobile surgical facilities located in Kuwait and Iraq in 2003, Walker et al.[11] reported 33.3% (428/1,286) of patients were discharged in 1 hour or less, while 29.4%, 10.3%, and 15.7% were discharged at 1 hour to 6 hours, 6 hours to 12 hours, and 12 hours to 24 hours, respectively. These results were similar to the time frame reported in our study, but the difference in location between the studies, as well as injury demographics given the period of the conflict, makes the comparison difficult. Conversely, in a case series of 30 patients treated in Iraq in 2003 by the Navy's forward-deployed echelon II medical unit, Bohman et al.[12] found the median LOS was 7.8 (IQR, 5.8–14.1) hours. The location, treatment facility, and immaturity of the operational environment and trauma/evacuation system differed from our study. The longer LOS reported by Bohman et al. may be related to the dynamic nature (e.g., inconsistency of available medical assets) of the invasion of Iraq in 2003. Our study occurred several years after initial entry into Afghanistan, which presumably means that the theater was more stable and medical evacuation assets were more consistently available. Lastly, previous studies have captured LOS at higher levels of care.[10,13,14] However, comparisons between these studies are difficult due to the differences in strategic functions of Role 2 and facilities providing higher levels of care. Moreover, given that Role 2s have limited patient holding capabilities, it is more appropriate to measure LOS in hours, whereas facilities with the ability to manage patients for extended durations may measure LOS in days. Doctrinally, Role 2 surgical teams are not intended to be placed without the larger Role 2 medical support elements that offer a holding capability. It is notable that during this study period, virtually all Role 2 teams conducted split operations and were oftentimes not supported by the doctrinal model.

As compared with our study, other studies reported similar factors associated with extended LOS at various medical treatment facilities. Our results reflect the association between LOS and blood transfusion, which was also reported in other studies.[15,16] Research also shows a decreased LOS for US forces as compared with other forces.[14,17,18] Spinella et al.[18] posited the shorter LOS for US forces might be due to rapid evacuation of these patients. Similar to our study, Riha et al.[10] found that LOS was associated with abdominal procedures. Dissimilar to our results, Bograd et al.[16] reported that abdominal complications were associated with total hospital LOS at Role 3 facilities in Iraq and Afghanistan ($p = 0.035$). Our results did not show a significant association between complications at Role 2 and LOS, but this difference may be due to the relatively short amount of time patients spent at Role 2. Furthermore, Bograd et al.[16] also reported injury severity score was associated with total intensive care unit and hospital LOS ($p = 0.017$, $p = 0.006$, respectively). We did not have data on anatomic injury severity in our database; therefore, we could not control for this potential confounder.

This study has several limitations. The Role 2 database was voluntarily recorded by health care professionals with limited training on data entry; therefore, we are unsure of the proportion of the Role 2 workload captured within the database and the database lacks data entry standardization. In addition, these data have not been validated against medical records, which make it difficult to corroborate the accuracy of the information in the database. The Role 2 Database lacks specific injury severity data, injury type and mechanisms were ranked according to injury severity in general. Misclassification of primary injury type or mechanism is possible in patients with multiple injuries. Furthermore, the database lacks calculated injury severity scores and patient outcomes after discharge from the Role 2 facility. Lastly, the Role 2 Database has missing data concerns. The database does not include data on nonmedical delays in patient transfer (i.e., mission, enemy, terrain, troops, or time) or anatomic injury severity. The database does not have information on Role 2 unit size and availability of supporting capabilities, such as medical company support; consequently, residual confounding may exist in our study results. Furthermore, a large proportion of potential study patients were excluded because they had misclassified or missing time and date data. However, we believe any potential differences in the excluded patients and the study patients were not due to the Role 2 LOS, and, therefore, that the data were missing at random (i.e., the analytical response was ignorable). Despite the important limitations of the Role 2 Database, it is the largest source of data available on patient medical care at Role 2.

Understanding the LOS at Role 2 is important, as civilian studies have shown LOS could impact patient outcomes.[1] Shorter LOS at Role 2 may be better for some casualties, because they would arrive at facilities with greater care capabilities sooner. Furthermore, faster evacuation out of Role 2 would minimize congestion along the combat casualty continuum of care.[2] However, these potential benefits may not be realized if patients were evacuated too quickly and did not receive adequate resuscitation and stabilization at Role 2. This would place these patients at risk for adverse outcomes during transport and at Role 3. Consequently, more research is needed on optimal timing for patient transfer, because this likely depends on several patient and tactical factors. From this analysis, it appears that utilization of the Role 2 surgical teams was adequate with regard to relatively rapid transfer. However, a higher-intensity and higher-volume scenario may overwhelm the current system. Military planners must adjust risk assessments to reflect the limited capacity and throughput of the Role 2 surgical teams as they have been employed in Afghanistan and Iraq.

Interventions, patient affiliation, discharge status, and injury mechanism were associated with LOS at Role 2. Understanding LOS at Role 2 may provide insight for future conflicts in different scenarios, but these results may not be generalizable to all combat environments, based on mission, enemy, terrain, troops, or time. Our study results will help guide training and current Role 2 support needs, particularly with regard to postoperative nursing care associated with delays in transfer to higher levels of medical care. More research is needed in this area, and future studies should focus on defining optimal timing of patient transfer based on injury type and stability, identifying the patient population that would gain the most outcome benefit from Role 2 interventions, and determining the association of LOS at Role 2 with long-term patient outcomes.

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DISCLOSURES

The authors declare no conflicts of interest.
Opinions, interpretations, conclusions and recommendations are those of the author and are not necessarily endorsed by the Department of Defense. A.S., J.G., T.L., and E.M.S. contributed to study design. A.S. contributed to data analysis. A.S., J.G., J.S., S.N., and E.M.S. contributed to data interpretation. A.S. wrote the manuscript and A.S., J.G., K.V.D., M.S., J.T., T.L., S.S., S.N., and E.M.S. critically revised the manuscript.

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- On the battlefield, Tri-Service nurses work side-by-side to care for the same casualties, yet each branch of service uses a different pre-deployment competency criteria (Figure 1)
- The Tri-Service Clinical Readiness “Knowledge, Skills and Attributes (KSA) Project” team, directed by the Deputy Secretary of Health Affairs, defined the KSAs specific to the combat environment for deployed medical teams, but with a focus on surgical and physician-based competencies (Figure 2)

This TriService team works and deploys together, so why do they all train differently and to inconsistent standards?

Figure 1: Triservice Predeployment standard variability

Objectives

This project aimed to use the evidence-based Clinical Transition Framework (CTF) to identify nursing competencies which are specific to the deployed environment and align with the Military Health System KSA Project domains

Methods

- The Vermont Nurses in Partnership (VNIP) CTF served as the foundation for the development of universal CCC nursing Competency Assessment Tools (CAT) (Figure 3)
- The competency tools directly align with the 8 KSA expeditionary domains:
  - wound/amputation/fracture management
  - head and spine injury
  - torso trauma
  - transfusion and resuscitation
  - airway and breathing
  - critical care/prevention
  - other military
  - universal domains (Figure 2)
- These tools were cross-walked with available pre-deployment tools (Navy and Air Force) and expert recommendations (Army) to promote consensus
- Nurse subject matter experts reviewed the developed competency statements for applicability, clarity, and comprehensiveness

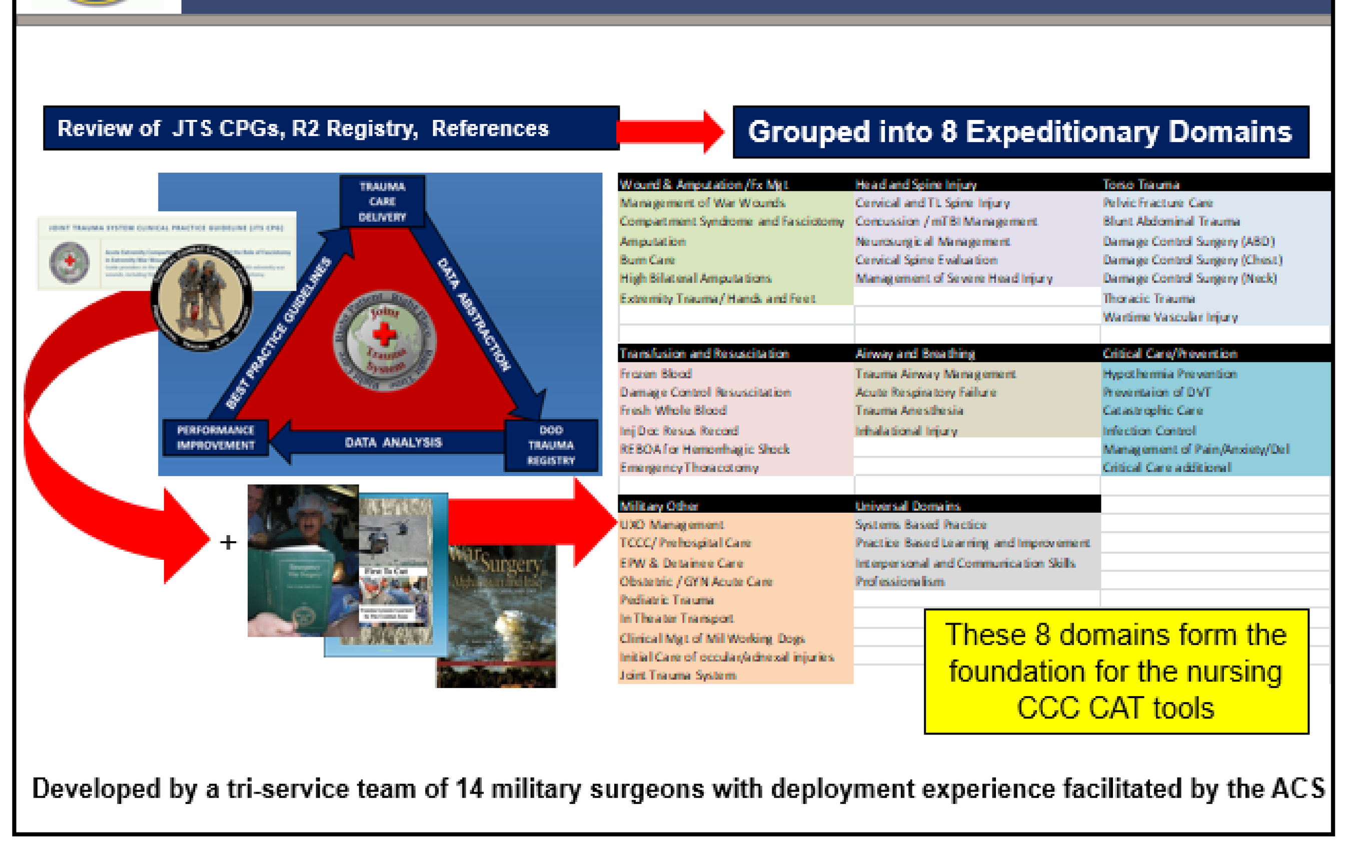


Figure 2: KSA domains of combat casualty care

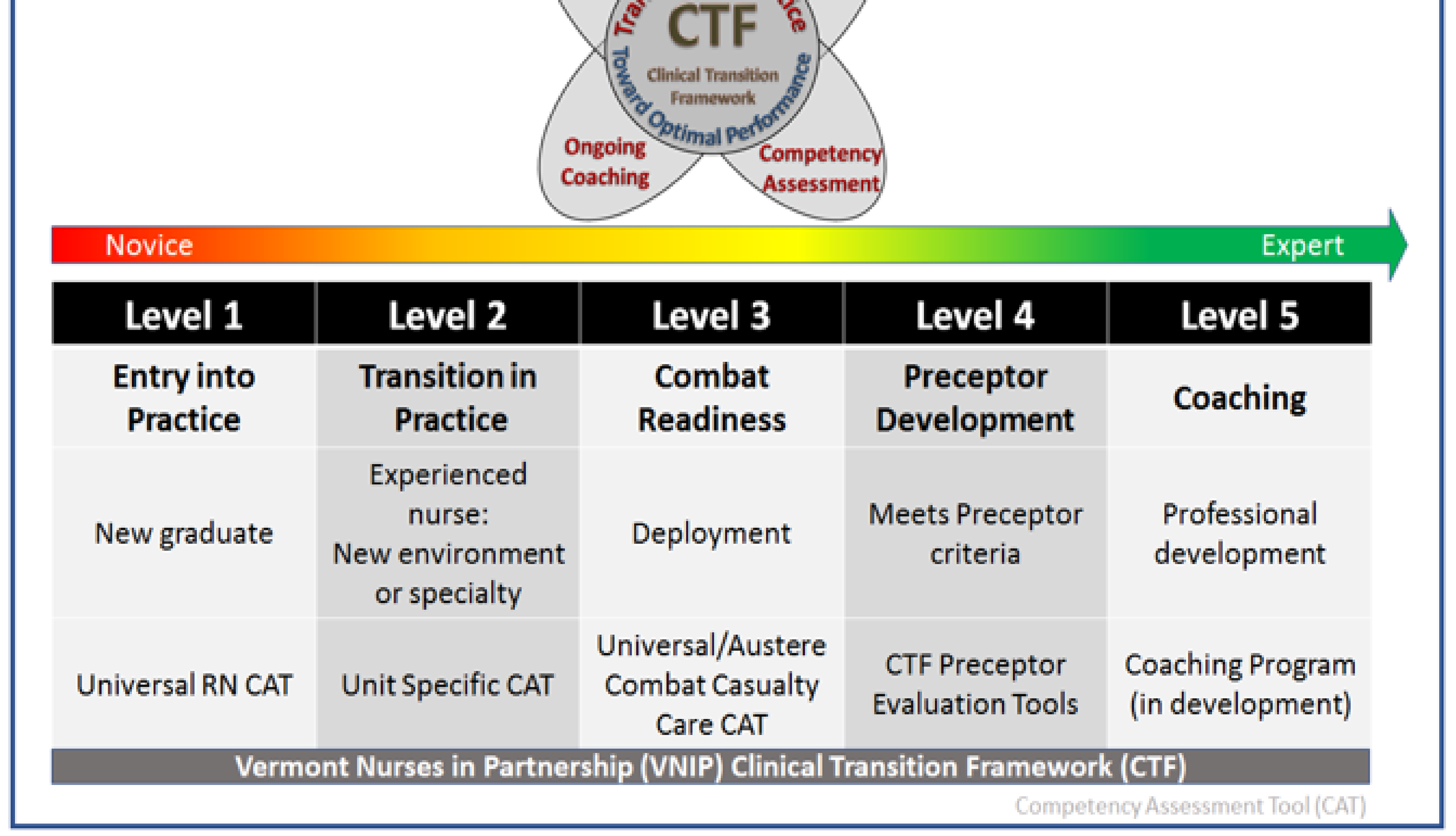


Figure 3: Clinical Transition Framework (CTF)

Results

- Two CATs were created: Role 3 CCC CAT, and Austere CAT (for Role 2 and en-route teams) (Figures 4a-d)
- The CCC CAT covers the 8 domains of expeditionary KSAs and includes 180 specific competency statements
- The Austere CAT includes 36 additional competency statements; focus is on the domains of expeditionary care within a resource-constrained environment and covers operational elements associated with small teams

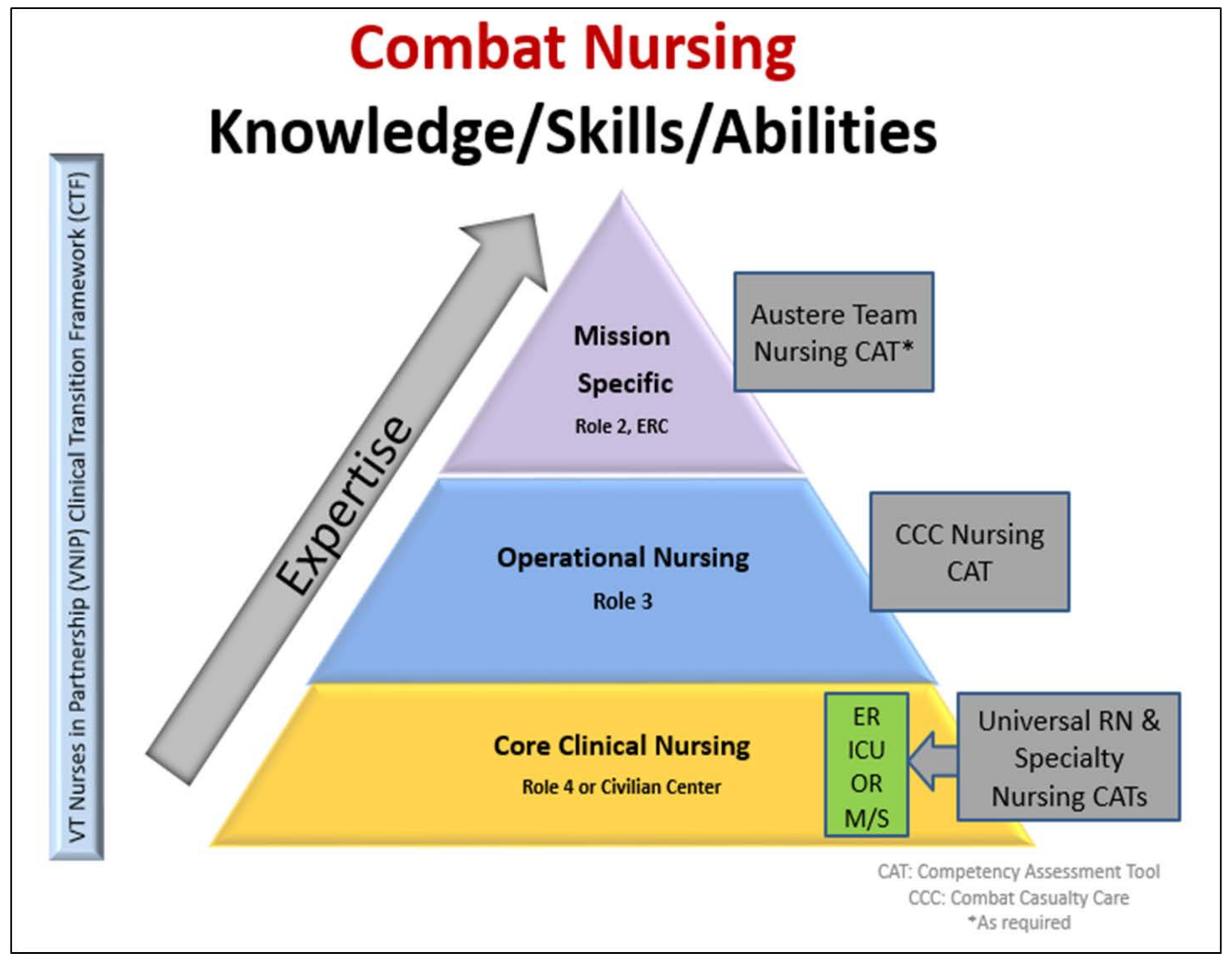


Figure 4a: Combat Nursing KSAs

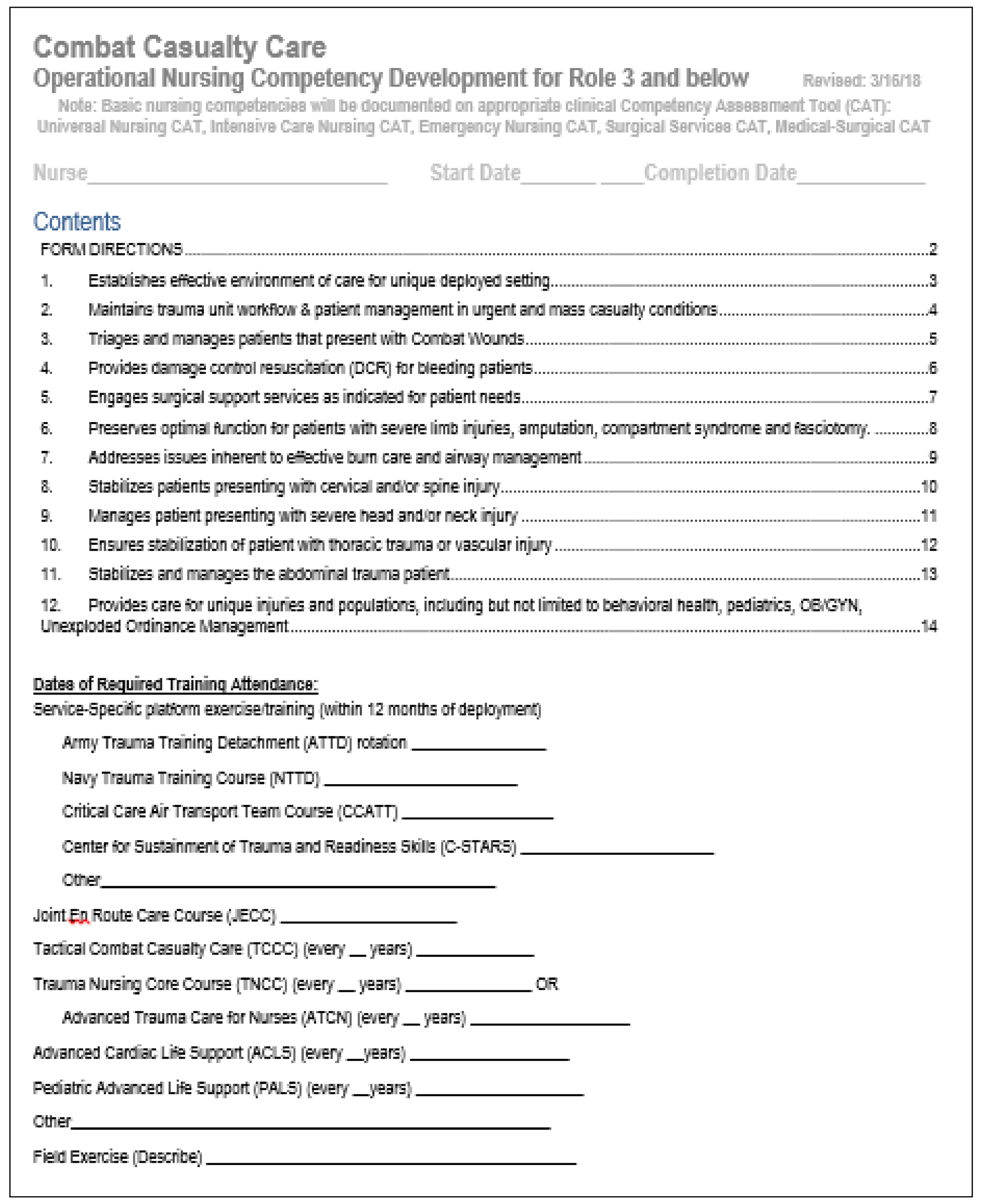
Pre-Deployment Competency Progression Model

Nursing Competency Assessment Tool Progression

Competency Assessment Tool (CAT)	Med-Surg	ICU	ED	OR
Core Clinical Competency Environment: Role 4/5 Competency Level: Competent				
Universal Foundational Nursing	x	x	x	x
Universal Trauma ICU		x		
Universal Trauma ED			x	
Universal Trauma OR				x
Operational Nursing Skills Environment: Role 3 Competency Level: Proficient				
Universal Combat Casualty Care	x	x	x	x*
Mission Specific Skills Environment: Austere (Role 2)/Special Operations/En-route Care Competency Level: Expert Trauma Nurse (Cross-Trained in ICU, ED, & OR)				
Universal Trauma ICU	Not applicable: Med-Surg Nurses do not deploy to a R2		x*	x*
Universal Trauma ED		x*		x*
Universal Trauma OR		x*	x*	
Austere Team		x	x	x

*Orientation/cross training

Figure 4b: Nursing Competency Tools for each Role of Care

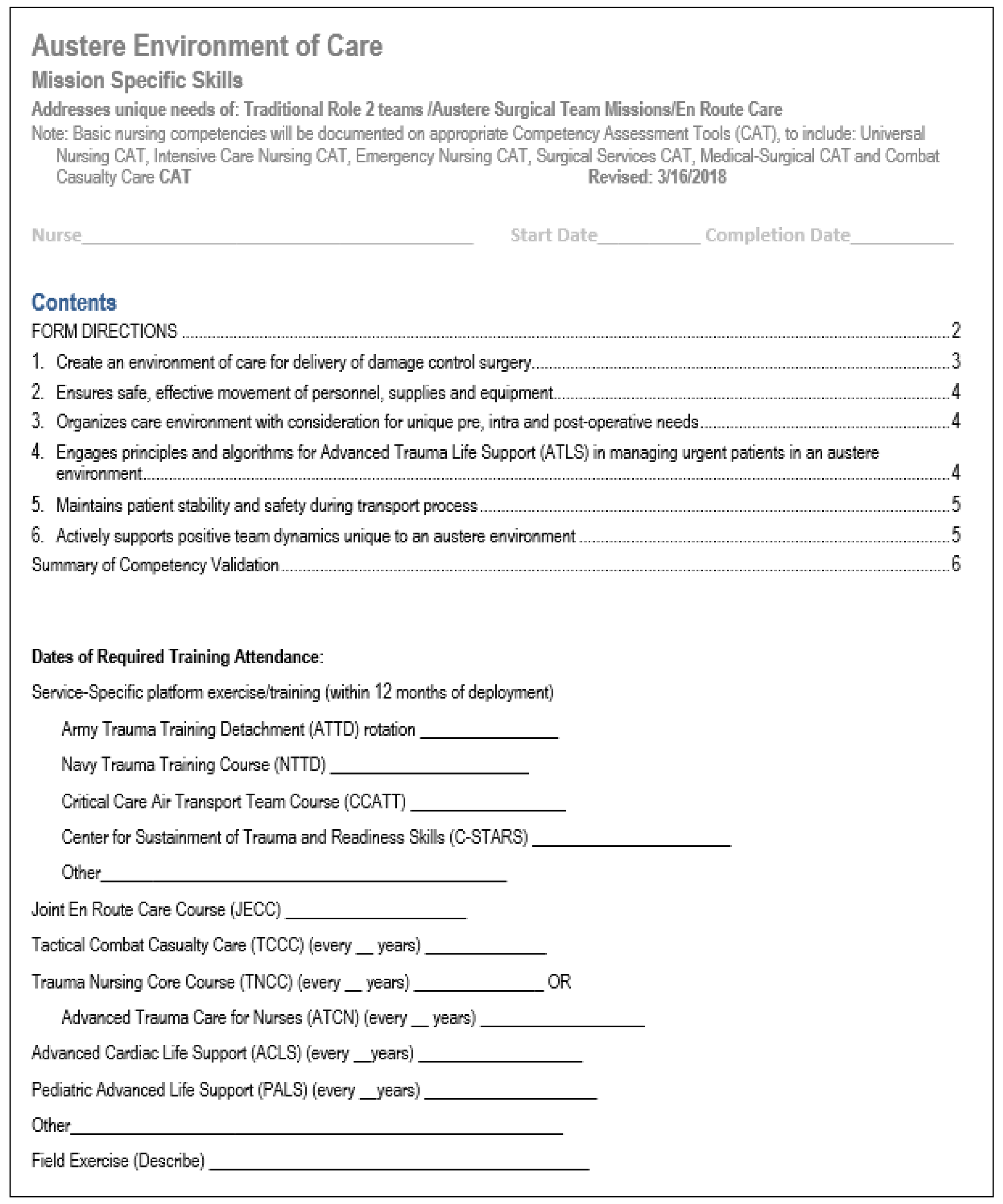

Combat Casualty Care
Operational Nursing Competency Development for Role 3 and below Revised: 3/16/18
Note: Basic nursing competencies will be documented on appropriate clinical Competency Assessment Tool (CAT): Universal Nursing CAT, Intensive Care Nursing CAT, Emergency Nursing CAT, Surgical Services CAT, Medical-Surgical CAT

Nurse ________ Start Date ________ Completion Date ________

Contents
FORM DIRECTIONS 2
1. Establishes effective environment of care for unique deployed setting 3
2. Maintains trauma unit workflow & patient management in urgent and mass casualty conditions 4
3. Triages and manages patients that present with Combat Wounds 5
4. Provides damage control resuscitation (DCR) for bleeding patients 6
5. Engages surgical support services as indicated for patient needs 7
6. Preserves optimal function for patients with severe limb injuries, amputation, compartment syndrome and fasciotomy 8
7. Addresses issues inherent to effective burn care and airway management 9
8. Stabilizes patients presenting with cervical and/or spine injury 10
9. Manages patient presenting with severe head and/or neck injury 11
10. Ensures stabilization of patient with thoracic trauma or vascular injury 12
11. Stabilizes and manages the abdominal trauma patient 13
12. Provides care for unique injuries and populations, including but not limited to behavioral health, pediatrics, OB/GYN, Unexploded Ordinance Management 14

Dates of Required Training Attendance:
Service-Specific platform exercise/training (within 12 months of deployment)
Army Trauma Training Detachment (ATTD) rotation ________
Navy Trauma Training Course (NTTD) ________
Critical Care Air Transport Team Course (CCATT) ________
Center for Sustainment of Trauma and Readiness Skills (C-STARS) ________
Other ________
Joint En Route Care Course (JECC) ________
Tactical Combat Casualty Care (TCCC) (every __ years) ________
Trauma Nursing Core Course (TNCC) (every __ years) ________ OR
Advanced Trauma Care for Nurses (ATCN) (every __ years) ________
Advanced Cardiac Life Support (ACLS) (every __ years) ________
Pediatric Advanced Life Support (PALS) (every __ years) ________
Other ________
Field Exercise (Describe) ________

Figure 4c: Combat Casualty Care Tool


Austere Environment of Care
Mission Specific Skills
Addresses unique needs of: Traditional Role 2 teams /Austere Surgical Team Missions/En Route Care
Note: Basic nursing competencies will be documented on appropriate Competency Assessment Tools (CAT), to include: Universal Nursing CAT, Intensive Care Nursing CAT, Emergency Nursing CAT, Surgical Services CAT, Medical-Surgical CAT and Combat Casualty Care CAT Revised: 3/16/2018

Nurse ________ Start Date ________ Completion Date ________

Contents
FORM DIRECTIONS 2
1. Create an environment of care for delivery of damage control surgery 3
2. Ensures safe, effective movement of personnel, supplies and equipment 4
3. Organizes care environment with consideration for unique pre, intra and post-operative needs 4
4. Engages principles and algorithms for Advanced Trauma Life Support (ATLS) in managing urgent patients in an austere environment 4
5. Maintains patient stability and safety during transport process 5
6. Actively supports positive team dynamics unique to an austere environment 5
Summary of Competency Validation 6

Dates of Required Training Attendance:
Service-Specific platform exercise/training (within 12 months of deployment)
Army Trauma Training Detachment (ATTD) rotation ________
Navy Trauma Training Course (NTTD) ________
Critical Care Air Transport Team Course (CCATT) ________
Center for Sustainment of Trauma and Readiness Skills (C-STARS) ________
Other ________
Joint En Route Care Course (JECC) ________
Tactical Combat Casualty Care (TCCC) (every __ years) ________
Trauma Nursing Core Course (TNCC) (every __ years) ________ OR
Advanced Trauma Care for Nurses (ATCN) (every __ years) ________
Advanced Cardiac Life Support (ACLS) (every __ years) ________
Pediatric Advanced Life Support (PALS) (every __ years) ________
Other ________
Field Exercise (Describe) ________

Figure 4d: Austere Environment of Care Tool

- Competency eva… evidence-based, … deployers, regar… theater of operati…
- Readiness may t… documented for e… Periodic Evaluati…
- Efforts are curren… during clinical pre…

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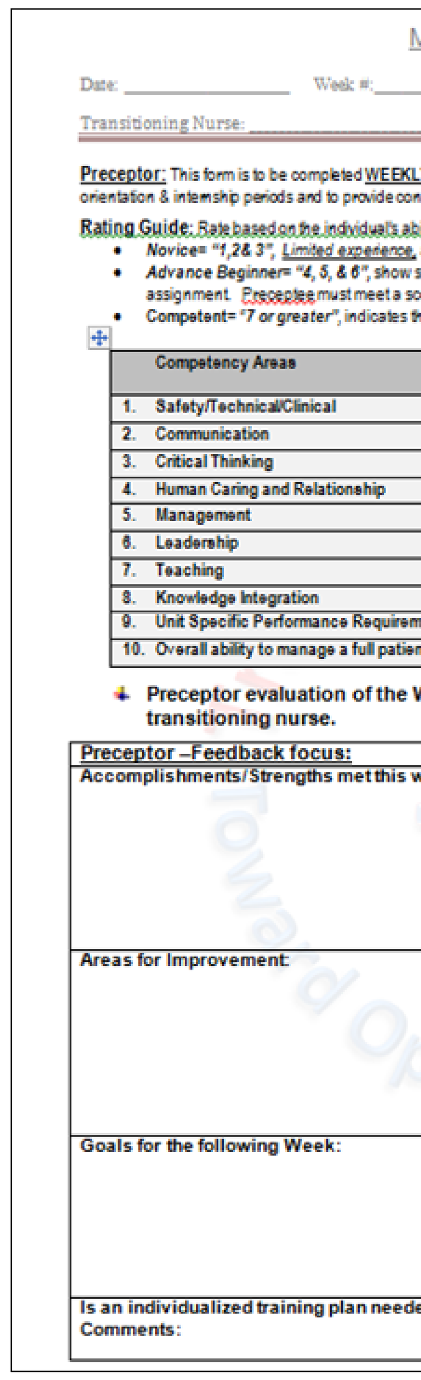


Figure 5: P…

- Combat casualty care occurs across a continuum from the point-of-injury to definitive care and rehabilitation at medical treatment facilities (MTFs) of increasing capability and capacity[1].
- This continuum occurs over thousands of miles and consists of several levels of care, with increased capabilities and resources at each level[2].
- Role 3 MTFs provide the highest level of care in the combat theater[3]. These MTFs accept patients directly from the point-of-injury or as a transfer from another MTF.
- Typical capabilities at Role 3 MTFs include advanced surgical interventions, imaging modalities, blood banks, and intensive care units[4].
- During the recent military conflict in Afghanistan, Role 3 MTFs were managed by different branches of the US military and the UK Defence Medical Services. Unique capabilities such as neurosurgery were generally centrally located (e.g., at Kandahar Air Field) and patients were transferred directly to that facility.
- Understanding the demographics, injury characteristics, and outcomes of the patients treated at these MTFs is essential in order to make future improvements to the delivery of care in the combat theater[5].

Objective

The purpose of this study was to describe patients that received initial treatment at Role 3 MTFs in Afghanistan following transfer from the point-of-injury.

Methods

- This was a retrospective review of data from the Department of Defense Trauma Registry (DoDTR).
- The inclusion criteria for this study were as follows:
  - Age ≥ 18 years
  - Casualty due to battle-related or non-battle-related injuries
  - Injured in Afghanistan between January 2007 and December 2015
  - Received treatment at either Bagram Air Field, Camp Bastion, Camp Dwyer, or Kandahar Air Field, and specifically identified as a Role 3 MTF in DoDTR
  - No documentation or records of prior treatment at a MTF before arrival at Bagram, Bastion, Dwyer, or Kandahar (received initial treatment from the point-of-injury at Role 3 MTFs)
- Descriptive statistics were used to evaluate patient characteristics, injury type and mechanism, injury severity, affected body regions, and outcomes.

Table 1: Demographics	Overall	Bagram	Bastion	Dwyer	Kandahar	*p*-value
Number of Patients						
	12,342	1,627 (13.2)	6,452 (52.3)	830 (6.7)	3,433 (27.8)	
Gender, n (%)						**<0.0001**
Male	12,096 (98.0)	1,544 (94.9)	6,376 (98.8)	817 (98.4)	3,359 (97.8)	
Age, mean (SD) years						**<0.0001**
	26.4 (7.7)	31.0 (10.3)	24.8 (6.1)	26.2 (9.0)	27.2 (7.5)	
Category of Injury, n (%)						**<0.0001**
Battle Injury	9,372 (75.9)	943 (58.0)	5,196 (80.5)	573 (69.0)	2,660 (77.5)	
Non-Battle Injury	2,970 (24.1)	684 (42.0)	1,256 (19.5)	257 (31.0)	773 (22.5)	
Type of Injury, n (%)						**<0.0001**
Blunt	4,698 (38.1)	725 (44.6)	2,227 (34.6)	372 (44.8)	1,374 (40.0)	
Burn	246 (2.0)	49 (3.0)	108 (1.7)	13 (1.6)	76 (2.2)	
Penetrating	7,904 (59.7)	853 (52.4)	4,107 (63.7)	444 (53.5)	1,972 (57.4)	
Unknown	22 (0.2)	0 (0.0)	10 (0.2)	1 (0.1)	11 (0.3)	
Mechanism of Injury, n (%)						**<0.0001**
Explosion	6,637 (53.8)	594 (36.5)	3,505 (54.3)	387 (46.6)	2,151 (62.7)	
Gun Shot Wound	2,782 (22.5)	362 (22.2)	1,684 (26.1)	215 (25.9)	521 (15.2)	
Motor Vehicle Crash	823 (6.7)	168 (10.3)	320 (5.0)	92 (11.1)	243 (7.1)	
Fall	666 (5.4)	190 (11.7)	278 (4.3)	41 (4.9)	157 (4.6)	
Other	1,425 (11.5)	312 (19.2)	659 (10.2)	95 (11.4)	359 (10.5)	
Unknown	9 (0.1)	1 (0.1)	6 (0.1)	0 (0.0)	2 (0.1)	
Injury Severity Score (ISS), n (%)						**<0.0001**
Mild (1-9)	8,513 (69.0)	1,159 (71.2)	4,568 (70.8)	613 (73.9)	2,173 (63.3)	
Moderate (10-15)	1,589 (12.9)	219 (13.5)	827 (12.8)	87 (10.5)	456 (13.3)	
Severe (16-24)	1,222 (9.9)	142 (8.7)	577 (8.9)	72 (8.7)	431 (12.6)	
Critical (>24)	1,009 (8.2)	106 (6.5)	476 (7.4)	58 (7.0)	369 (10.7)	
Unknown	9 (0.1)	1 (0.1)	4 (0.1)	0 (0.0)	4 (0.1)	
Dominant Injured Body Region, n (%)*						
Head/neck	3,276 (26.5)	433 (26.6)	1,442 (22.3)	268 (32.3)	1,133 (33.0)	**<0.0001**
Face	1,061 (8.6)	150 (9.2)	536 (8.3)	64 (7.7)	311 (9.1)	0.35
Thorax	1,138 (9.2)	176 (10.8)	559 (8.7)	70 (8.4)	333 (9.7)	**0.03**
Abdomen	1,061 (8.6)	140 (8.6)	574 (8.9)	61 (7.3)	286 (8.3)	0.44
Extremities	4,824 (39.1)	631 (38.8)	2,561 (39.7)	283 (34.1)	1,349 (39.3)	**0.02**
External	3,685 (29.9)	459 (28.2)	2,023 (31.4)	254 (30.6)	949 (27.6)	**0.001**
Discharge Status, n (%)						**0.10**
Dead	389 (3.2)	47 (2.9)	193 (3.0)	20 (2.4)	129 (3.8)	
Alive	11,953 (96.8)	1,580 (97.1)	6,259 (97.0)	810 (97.6)	3,304 (96.2)	

*** Abbreviated Injury Scale 2005 body regions; patients could have more than one dominant injured body region.**

Figure 1: Mortality by ISS Categories

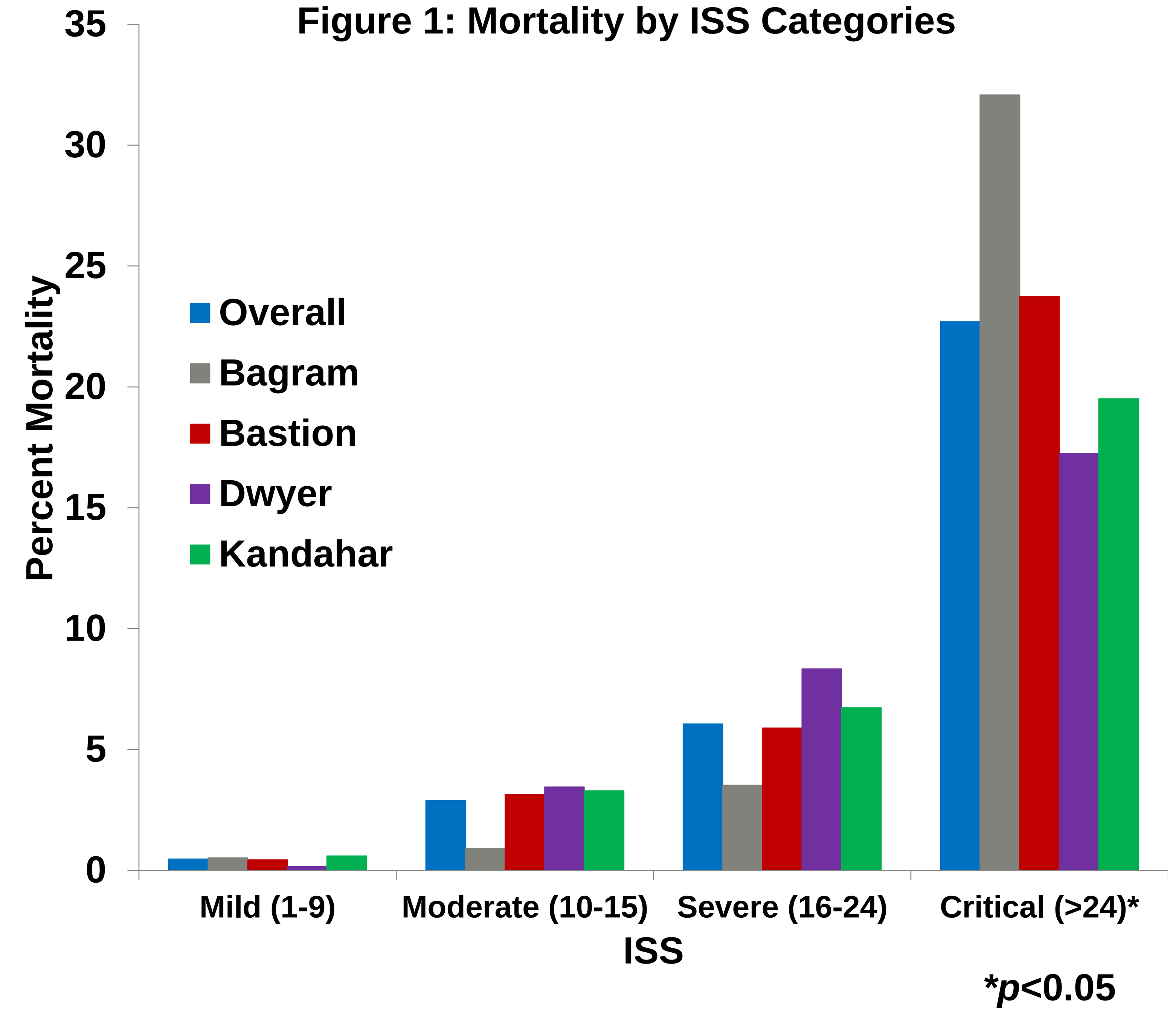
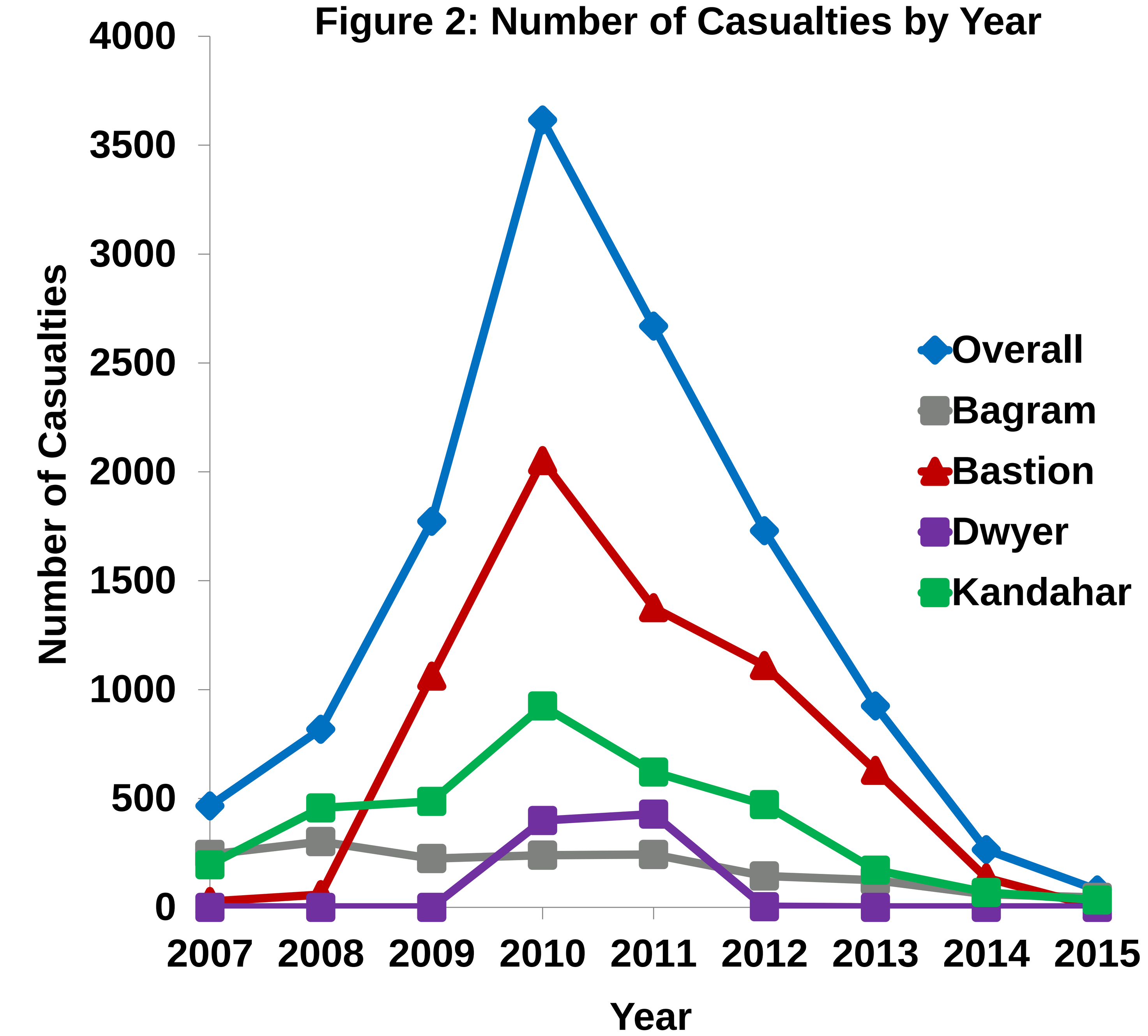


Figure 2: Number of Casualties by Year



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- During the recent military conflict in Afghanistan (AFG), U.S. Army Role 2 (R2) Forward Surgical Teams doctrinally deployed three general surgeons and one orthopaedic surgeon, leaving an imbalance of surgeons when the teams are split in support of dispersed operations.
- The newly redesigned U.S. Army Forward Resuscitative Surgical Team (FRST) requires two general surgeons and two orthopaedic surgeons for each team.
- Describing orthopaedic injuries and procedures found at R2 Medical Treatment Facilities (MTFs) may improve pre-deployment preparation of future teams and further inform military planners on how to efficiently plan for personnel, equipment, and supply requirements at these facilities.

Objective

The purpose of this study was to perform the first epidemiologic review of orthopaedic injuries and procedures performed at R2 MTFs in AFG.

Methods

- Retrospective data extracted from the Joint Trauma System R2 Database was used for this analysis.

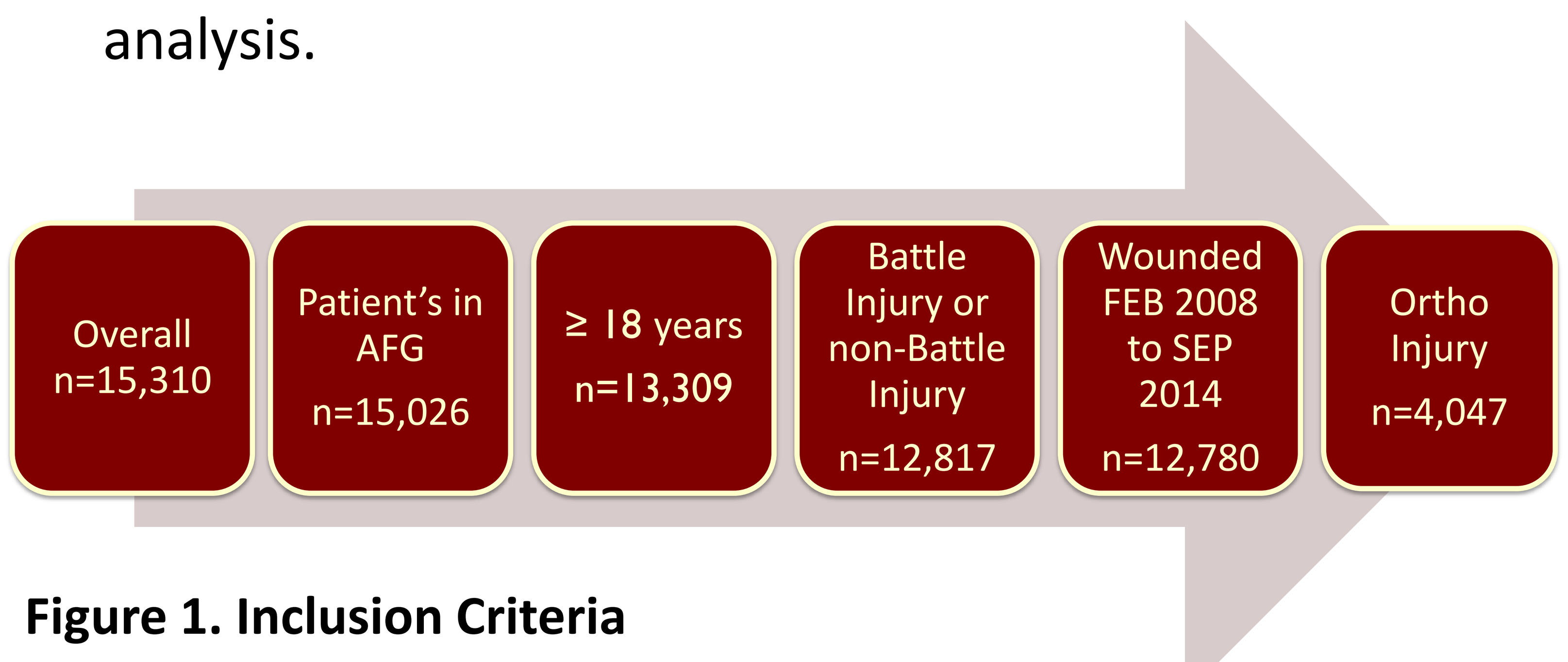

Figure 1. Inclusion Criteria

- Inclusion Criteria: at least one musculoskeletal injury to the shoulder girdle, extremities, spine, or hip/pelvis.
- Descriptive statistics were used to evaluate patient characteristics by demographics, body region of injury, type of injury, and interventions.

Table 1. Demographics

Variable	n	%
Total Participants	4,047	100.0
Age, year, median (IQR)	25	22, 30
Male	3,933	97.2
Battle Injured	3,208	79.3
Patient Affiliation		
U.S. Military	1,326	32.8
non U.S. Military (e.g. AFG/NATO Forces)	1,768	43.7
Civilian or Unknown	953	23.5
Mechanism of Injury		
Explosion	1,976	48.8
Gunshot Wound	1,133	28
Motor Vehicle Crash	402	9.9
Other	309	7.6
Fall	153	3.8
Type of Injury		
Penetrating	2,387	59
Blunt	1,154	28.5
Penetrating and Blunt	305	7.5
Burn	50	1.2
***Combat Mortality Index- Prehospital**		
Mild	2,222	54.9
Moderate	974	24.1
Severe	247	6.1
Critical	152	3.8
Admission Vital Signs, mean (SD)		
Pulse, beats per minute	92.3	23.5
Respiratory rate, breaths per minute	19.6	6.0
Systolic blood pressure, mm Hg	128.7	20.4
Oxygen saturation, %	97.1	5.4
Temperature, °F	98.1	1.3

*Combat mortality index (CMI) was used as a surrogate metric for Injury Severity; CMI uses systolic blood pressure, heart rate, and Glasgow Coma Score.

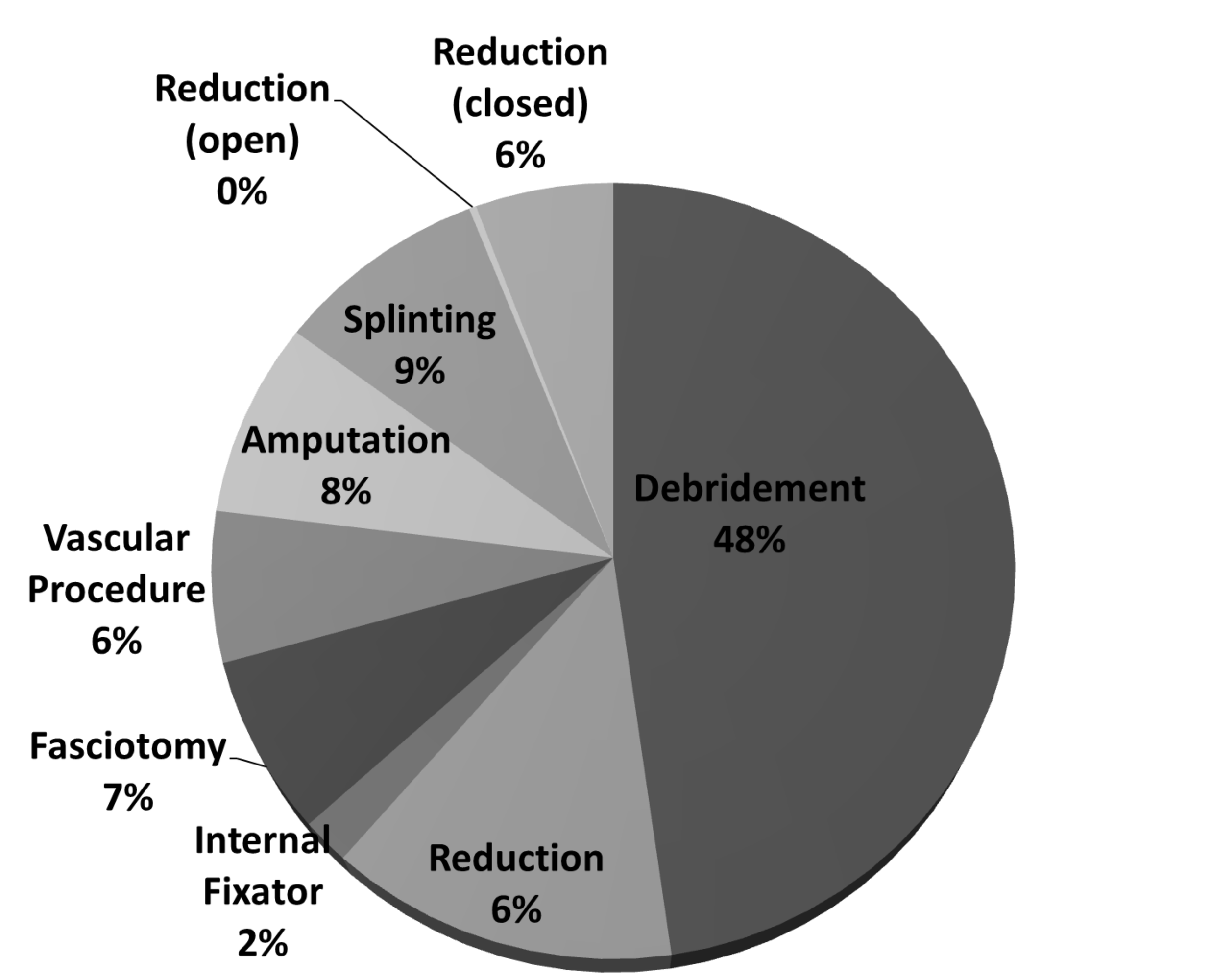

Figure 2. Orthopaedic Procedures Performed (n=3,283)

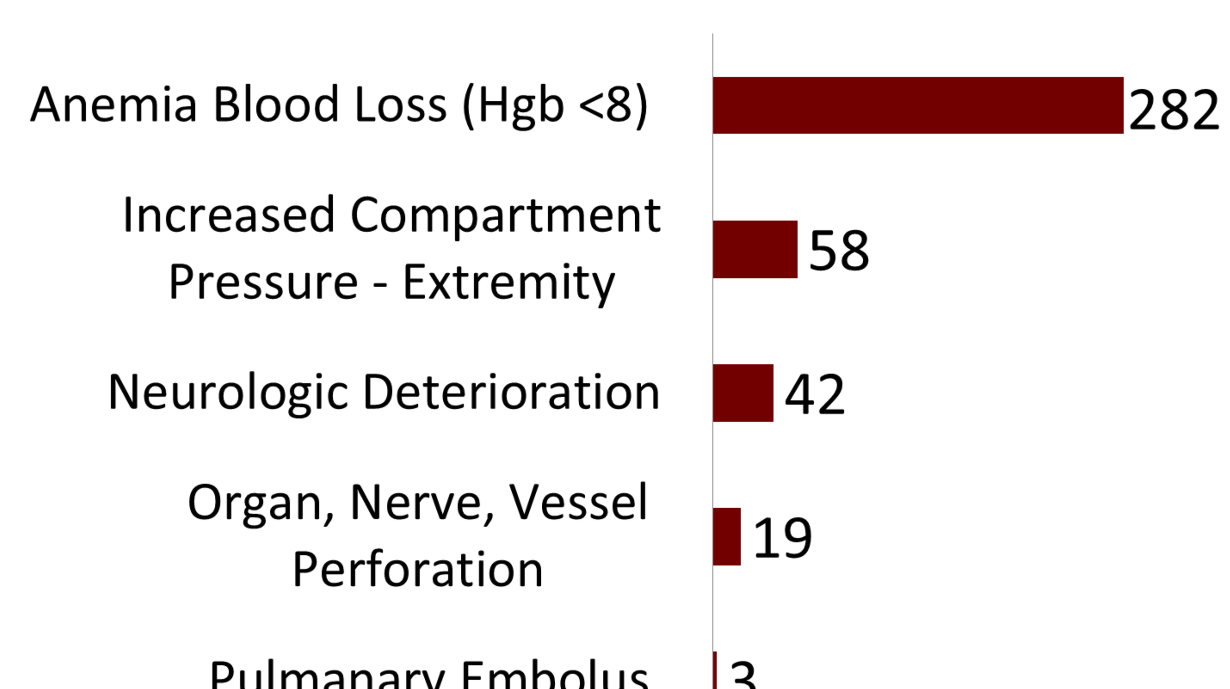

Figure 3. Complications (n=404)

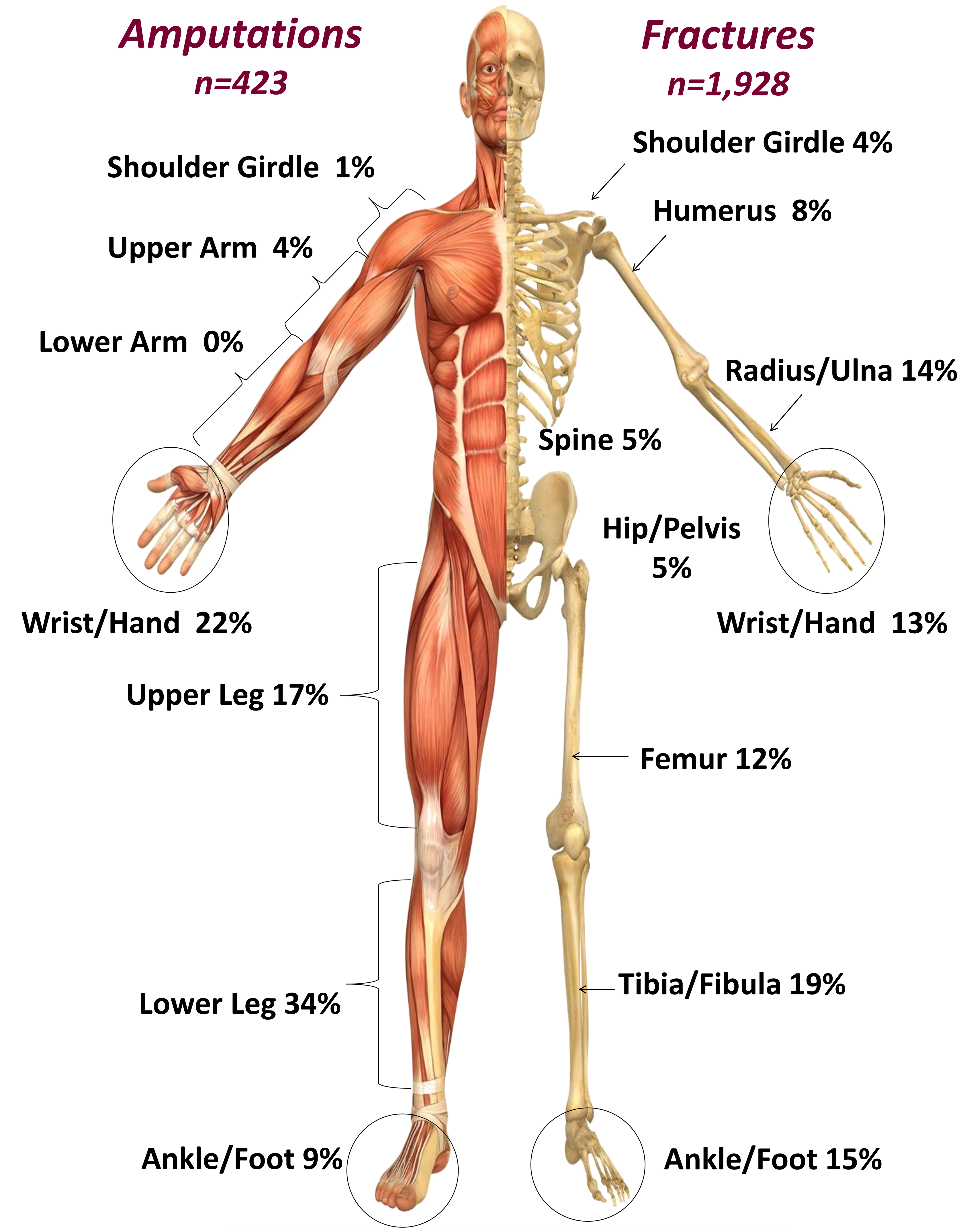

Figure 4. Diagnosed Amputations and Fractures

Table 2. Additional Diagnosed Orthopaedic Injuries

Variables	Total	*Unspecified	Fractures	Amputations	Joint	Muscle	Nerve/ Vascular
Total	**5,288**	**2,095**	**1,928**	**423**	**399**	**263**	**180**
Upper Extremity	**1,977**	**820**	**778**	**137**	**154**	**7**	**81**
Shoulder Girdle	149	7	80	3	59	0	0
Upper Arm	568	362	153	16	0	0	37
Elbow	34	0	1	0	33	0	0
Lower Arm	478	203	267	0	0	0	8
Wrist/Hand	602	202	243	94	62	0	1
Other UE	146	46	34	24	0	7	35
Lower Extremity	**2,692**	**1,158**	**947**	**272**	**210**	**6**	**99**
Upper Leg	765	431	231	72	0	0	31
Knee	120	0	3	0	88	0	29
Lower Leg	1145	627	371	145	1	0	1
Ankle/Foot	542	94	291	36	121	0	0
Other LE	120	6	51	19	0	6	38
Spine	**342**	**0**	**97**	**0**	**0**	**245**	**0**
Cervical	157	0	32	0	0	125	0
Thoracic	66	0	30	0	0	36	0
Lumbar	119	0	35	0	0	84	0
Hip/Pelvis	**226**	**93**	**99**	**7**	**27**	**0**	**0**
Unknown	**51**	**24**	**7**	**7**	**8**	**5**	**0**

*Unspecified injuries included penetrating wounds and other unknown injuries.

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- Airway compromise is the second leading cause of death on the battlefield after hemorrhage[1]
- Prehospital airway management is a controversial topic in the civilian world[2]
- Established in 2008, the Role 2 Database (R2D) is the largest body of modern prehospital information[3,4]
- Previous studies have been from Role 3 perspective or limited in scope[5,6]
- Few studies have utilized the R2D, which includes thousands of casualties injured between 2008 and 2014

Objectives

- Explore the hypothesis that those requiring airway intervention were more severely injured and less likely to survive
- Substratify these casualties for hypothesis-generating patterns

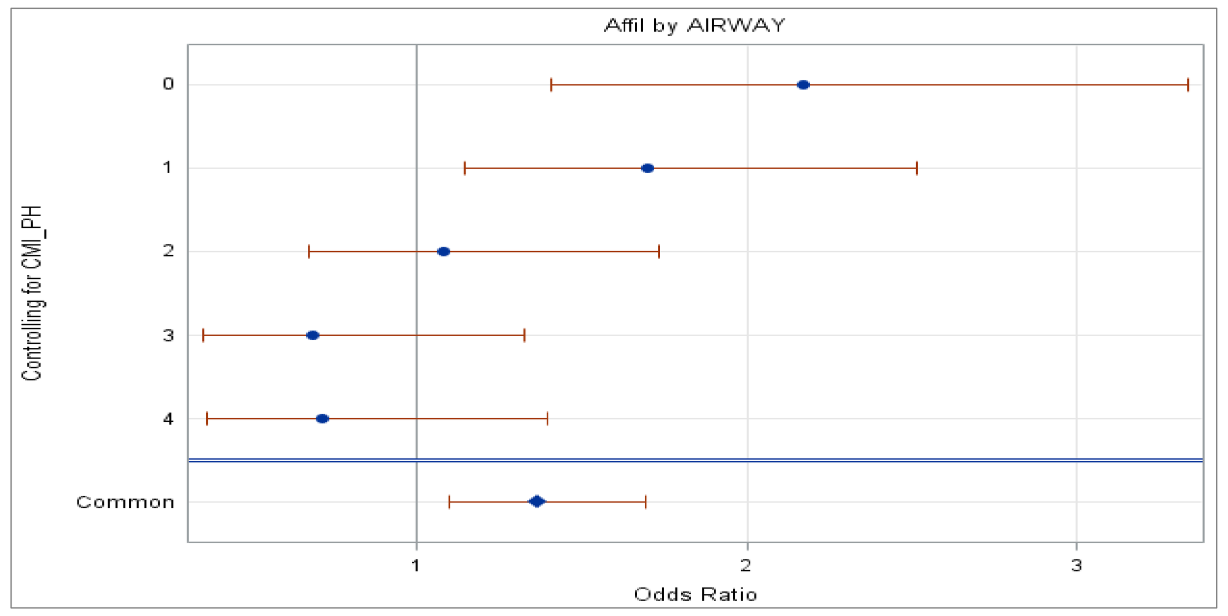
Methods

- Retrospective review of R2D
  - Inclusion: adult patients injured in Afghanistan who were treated at a Role 2 facility between February 2008 and September 2014
  - Exclusion: patients who sustained isolated disease or mental health/psychiatric diagnoses
- Primary interests were mortality and airway interventions
  - Cricothyrotomy
  - Endotracheal intubation
  - Airway not otherwise specified (NOS) (e.g. bag-valve mask, nasopharyngeal airway, supraglottic airway)
- Other variables as available in the dataset were included for analysis
  - Demographics e.g. age, nationality
  - Combat mortality index – Prehospital
  - Injuries, interventions, and complications
  - Vital signs
  - Transport times
- Data were evaluated using descriptive statistics and XYZ

- Of 12,780 casualties included in this study, 890 (7%) underwent an airway procedure
- Casualties were mostly male (96.6%, 12350/12780) and had a median age of 25 (IQR 21-30)

	Total	Airway (+)	Airway (-)
Number of Patients, n (%)	**12780 (100)**	**890 (7.0)**	**11890 (93.0)**
Patient Affiliation, n (%)			
US Forces	4667 (36.5)	202 (22.7)	4468 (37.6)
Non-US Mil	**4933 (38.6)**	**419 (47.1)**	**4514 (38.0)**
Other	3180 (24.9)	269 (30.3)	2911 (24.5)
Category of Injury			
Battle Injury	9733 (76.2)	747 (84.7)	8986 (75.5)
Non-Battle Injury	**3047 (23.8)**	**134 (15.3)**	**2913 (24.5)**
Prehospital CMI			
Mild	7003 (54.8)	135 (15.2)	6868 (57.8)
Moderate	2941 (23.0)	167 (18.8)	2774 (23.3)
Severe	747 (5.9)	203 (22.8)	544 (4.6)
Critical	537 (4.2)	246 (27.7)	291 (2.5)
Unknown	**1552 (12.1)**	**139 (15.6)**	**1413 (11.9)**
Outcome			
Alive - RTD	4498 (35.2)	78 (8.9)	4420 (37.1)
Alive - Transported	7321 (57.3)	585 (65.7)	6736 (56.7)
Dead	920 (7.2)	225 (25.3)	695 (5.8)
Unknown	41 (0.3)	2 (0.2)	39 (0.3)

Table 1: Patient demographics in casualties that did vs did not undergo an airway procedure. CMI, Combat Mortality Index ; RTD, Returned to Duty



Graph 1: Need help here

	Airway NOS	Intubation	Cric/Trach
Age	25 (21-30)	25 (22-30)	25 (23-30)
SBP (mmHg)	121 (96-137)	119 (95-139)	110 (69-134)
Unassisted Respiratory Rate (bpm) [n]	**20 (16-27) [503]**	**15 (10-20) [98]**	**12 (0-19) [60]**
Pulse (bpm)	**104 (81-126)**	**100 (71-119)**	**87.5 (62.5-116.5)**
O_2 Saturation (%)	**98 (94-100)**	**99 (94-100)**	**94.5 (84.5-99.5)**
Temperature (ºF)	97.7 (96.6-98.6)	97.3 (95.8-98.3)	97.2 (96.8-98.0)

Table 2: Physiological characteristics of casualties who underwent a prehospital airway, definitive airway, intubation, or cric/trach. Values are median (IQR). SBP, systolic blood pressure

	Total Casualties	Casualties who Underwent Airway Management or Breathing Procedure(s)
Other Life-Saving Interventions Received Prior to Arrival to Role 2 Facility, n (%)		
Needle Decompression	91 (0.7)	28 (3.1)
Hemodynamics (hemostatics, TQ, fluid/blood)	4112 (32.2)	439 (49.4)
Medications	**975 (7.6)**	**102 (11.5)**
Mortality Status, n (%)		
Died on Arrival to Role 2 Facility	64 (0.5)	22 (2.5)
Died in Role 2 Facility	797 (6.2)	225 (25.3)
Physiological Status on Arrival to Role 2 Facility, n (%)		
Patients with recorded arrival vital signs, n (%)	11975 (93.7)	800 (90.0)
Hypotensive (SBP < 90)	538 (4.5)	167 (20.9)
Bradycardia (BPM < 60)	453 (3.8)	99 (12.4)
Tachycardia (BPM ≥ 100)	3301 (27.6)	435 (54.4)
Hypoxic (Tissue O2 < 94%)	479 (4.0)	76 (9.5)
Glasgow Coma Scale (≤ 8)	461 (3.8)	387 (48.4)
Medication/Anesthetic, n (%)		
Patients with recorded analgesia, n (%)	958 (7.5)	89 (10.0)
Ketamine	72 (7.5)	12 (13.5)
Morphine	365 (38.1)	7 (7.9)
Fentanyl	261 (27.2)	14 (15.7)
Others		
Elapsed Time from Being Wounded to Arrival at Role 2 Facility		
Patients with available time information, n (%)	6242 (48.8)	335 (5.1)
Elapsed Time, median (IQR)	**78 (44-167)**	**65.0 (41.5-135)**
Patients with Arrival Time < 60 minutes, n (%)	2411 (36.7)	142 (42.3)

Table 3: Comparisons of interventions, status, mortality, and transport times for casualties who underwent airway intervention to the total population.

*** Bolded values have statistical significance of p ≤ 0.05**

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6. An Analysis of Battle
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Deployed Nursing Competencies Utilizing Consensus Combat Casualty Care Doma

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Nicole Caldwell, BA, RN[1]; LTC Christopher VanFosson, PhD, MHA, RN[1]

[1]US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX; [2] VT Nurses in Partnership, Ascutney, VT

Introduction

- On the battlefield, Tri-Service nurses work side-by-side to care for the same casualties, yet each branch of service uses a different pre-deployment competency criteria (Figure 1)
- The Tri-Service Clinical Readiness "Knowledge, Skills and Attributes (KSA) Project" team, directed by the Deputy Secretary of Health Affairs, defined the KSAs specific to the combat environment for deployed medical teams, but with a focus on surgical and physician-based competencies (Figure 2)

This TriService team works and deploys together, so why do they all train differently and to inconsistent standards?

Figure 1: Triservice Predeployment standard variability

Objectives

This project aimed to use the evidence-based Clinical Transition Framework (CTF) to identify nursing competencies which are specific to the deployed environment and align with the Military Health System KSA Project domains

Methods

- The Vermont Nurses in Partnership (VNIP) CTF served as the foundation for the development of universal combat casualty care (CCC) nursing Competency Assessment Tools (CAT) (Figure 3)
- The competency tools directly align with the 8 KSA expeditionary domains:
  - wound/amputation/fracture management
  - head and spine injury
  - torso trauma
  - transfusion and resuscitation
  - airway and breathing

Figure 2: KSA domains of combat casualty care

Figure 3: Clinical Transition Framework (CTF)

Results

- Two CATs were created: Role 3 CCC CAT, and Austere CAT (for Role 2 and en-route teams) (Figures 4a-d)
- The CCC CAT covers the 8 domains of expeditionary KSAs and includes 180 specific competency statements
- The Austere CAT includes 36 additional competency statements; focus is on the domains of expeditionary care within a resource-constrained environment and covers operational elements associated with small teams

Figure 4a: Combat Nursing KSAs

Figure 4b: Nursing Competency Tools for each Role of Care

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A Case Series of U.S. Military Working Dogs Treated by Role 2 Surgical Teams in Afghanistan

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LTC Thomas Edwards, DVM, MS, DACVECC; LTC Jacquelyn Parker, DVM, MS, DACVS; Nicole Caldwell, BA, RN; Tricia Garcia-Choudary, MPH, BSN, RN
COL (Ret.) Elizabeth Mann-Salinas, PhD, RN, FCCM
U.S. Army Institute of Surgical Research, JBSA Fort Sam Houston, TX

Background

- Military working dogs (MWDs) are essential members of the military force, and like humans, may need damage control resuscitation and/or surgery when traumatically injured in theater.
- Veterinary care is ideal, but may be unavailable.
- Several case series have reported MWDs receiving medical treatment by Role 2 (R2) surgical teams; therefore, R2 surgical teams need to be prepared to treat both human and canine casualties.
- R2 surgical units receive pre-deployment instruction and training to prepare them for managing the human casualties they will see in theater. However, there are no standard training processes to prepare teams to care for injured MWDs, and there is relatively little published data on their injuries.
- The Joint Trauma System (JTS) is planning to release the updated MWD Clinical Practice Guideline (CPG) to replace the 2011 CPGs that provided guidance to non-veterinary providers.

Objectives

The purpose of this study was to perform a comprehensive review of injured MWDs in the R2 dataset and to provide awareness to R2 surgical teams that will likely care for MWDs.

Results

- Between 2009 and 2012, the R2 dataset contained eight MWDs with traumatic injuries.
- Five MWDs had known demographics; all were male with a mean age of 4.6±1.3 years.
- Treatment occurred at four facilities in Afghanistan.
- No documentation of prehospital care was present in the R2 dataset.
- Arrival mode included: MEDEVAC-Air (75%, n=6), walked/carried (13%, n=1), and unknown (13%, n=1).
- Seven arrived alive at the R2.
- The majority of MWDs suffered penetrating, battle-related injuries (75%, n=6).
- Primary mechanisms of injury were gunshot wounds (50%, n=4), followed by blast (25%, n=2), and temperature-related (25%, n=2) injuries.
- Injured body regions: face (11%, n=1), thorax (11%, n=1), other (33%, n=3), extremity (45%, n=4).
- 86% (n=6) were evacuated alive from R2 surgical teams.
- According to documented vital signs at discharge from R2, 86% (n=6) survived.

Diagnosis	n (%)
Femur fracture	1 (13%)
Frostbite	1 (13%)
Heat exhaustion	1 (13%)
Pneumothorax	1 (13%)
Humerous fracture	2 (25%)
Soft tissue injury	2 (25%)

Interventions	n (%)
Plasma administration	1 (13%)
Analgesic administration	1 (13%)
Airway placement	1 (13%)
Laparotomy	1 (13%)
Crystalloid administration	6 (75%)

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Traumatic Cardiac Arrest in Role 2 Surgical Units in Afghanistan

Mithun R. Suresh, MD[1]; Amanda M. Staudt, PhD, MPH[1]; Tuan D. Le, MD, DrPH[1]; LTC Christopher A. VanFosson, PhD, RN[1]; Nicole W. Caldwell, RN[1];
COL Kevin K. Chung, MD[2,3]; CPT Ian L. Hudson, DO, MPH[1]; COL Jennifer M. Gurney, MD[1,4]; CAPT Zsolt T. Stockinger, MD[4]; Col Stacy A. Shackelford, MD[4];
COL Shawn C. Nessen, DO[1]; COL (Ret.) Elizabeth A. Mann-Salinas, PhD, RN[1]
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Introduction

- Role 2 (R2) surgical units are positioned in far-forward and austere locations with limited resources and patient holding capabilities
- Consequently, casualties treated at R2 are frequently evacuated to higher levels of care, generally in under three hours [1]
- Casualties that experience traumatic cardiac arrest (TCA) consume large amounts of resources, such as massive blood transfusions and require emergent surgical interventions, to include resuscitative thoracotomy and damage control surgery
- Historical survival percentages for TCA patients in the setting of Role 3 combat support MTFs were reported as 8%,11%, and 21.5% [2-4]

Objectives

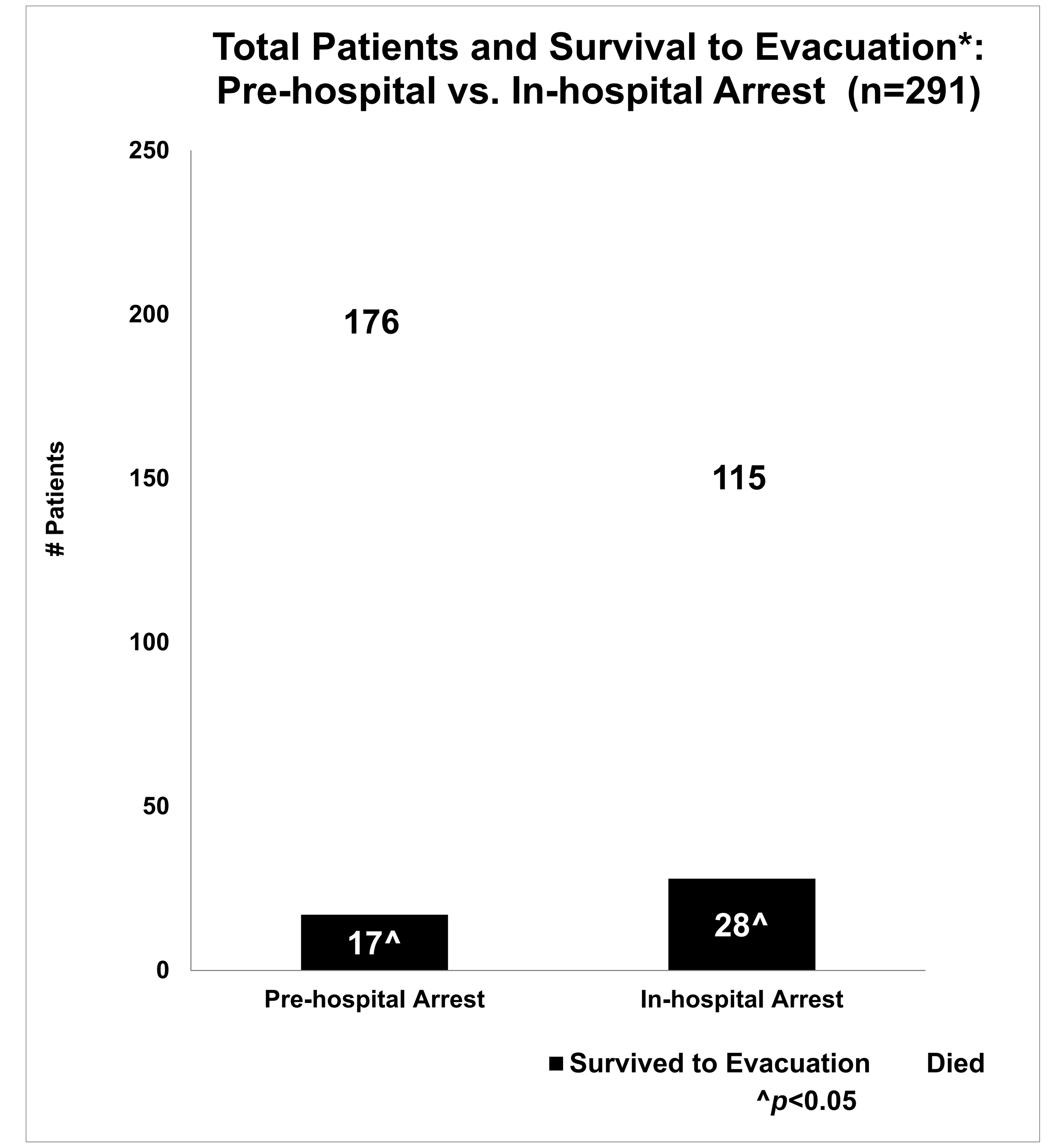
The purpose of this study was to perform an analysis of TCA casualties treated by R2 surgical units in order to maximize their ability to care for these casualties in the future

Methods

- Data were obtained from the Joint Trauma System R2 Database

Results

	Survival to Evacuation (n=45, 15%)	Died (n=246, 85%)	*p*-value
Age, median (IQR)			0.56
	25 (22-30)	25 (21-30)	
Gender, n (%)			0.85
Male	44 (97.8)	237 (96.3)	
Affiliation, n (%)			0.66
Non-US Military	18 (40.0)	115 (46.8)	
US Military	17 (37.8)	78 (31.7)	
Other	10 (22.2)	53 (21.5)	
Mechanism of Injury, n (%)			0.86
Explosion	20 (44.4)	116 (47.1)	
Gunshot Wound	17 (37.8)	97 (39.4)	
Crash	4 (8.9)	11 (4.5)	
Fall	0 (0.0)	2 (0.8)	
Other	3 (6.7)	13 (5.3)	
Unknown	1 (2.2)	7 (2.9)	
Type of Injury, n (%)			0.02
Penetrating	26 (57.8)	185 (75.2)	
Blunt	6 (13.3)	30 (12.2)	
Penetrating and Blunt	5 (11.1)	19 (7.7)	
Burn	2 (4.4)	5 (2.0)	
Unknown	6 (13.3)	7 (2.9)	
Interventions			
Resuscitative Thoracotomy, n (%)	14 (31.1)	65 (26.4)	0.52
Blood Products Transfused, median (IQR)	16 (5-29)	1 (0-9)	<0.01



*Patients are evacuated from R2 median of 2.5 (IQR 1.2 – 5.5) hours [1]

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Forward Surgical Care
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Role 2 - Trauma Bay

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Evaluation of Pre-deployment Training for Army Nurses and Medics

LTC Christopher VanFosson, PhD, MHA, RN; Jennifer Trevino, MBA; Krystal Valdez-Delgado, BSN, RN; Nicole Caldwell, BA, RN
Amanda Staudt, PhD, MPH; Tricia Garcia-Choudary, MPH, BSN, RN; COL (Ret.) Elizabeth Mann-Salinas, PhD, RN
U.S. Army Institute of Surgical Research, Fort Sam Houston, TX

Introduction

- Clinicians face several challenges when caring for trauma patients on the battlefield. Combat casualty care may include:
  - Treating patients while under attack
  - Resource constraints
  - Periods of limited visibility/darkness
  - Rugged terrain
  - Extreme temperatures
- Therefore, optimal preparation for clinicians includes exposure to as many combat trauma situations as possible prior to deployment
- Army nurses and combat medics undergo a wide variety of pre-deployment training events
- The literature contains no evaluation of Army nurse or combat medic pre-deployment training

Objective

The purpose of this study was to survey trauma care-oriented Army nurses and combat medics to describe the range of pre-deployment trainings they experienced in order to provide guidance on future pre-deployment training requirements

Methods

- Survey link sent to military email accounts provided by US Army Human Resource Command
  - Army nurses from active (n=2,344) and reserve (n=2,458) components
  - Active duty combat medics (n=17,535)
- Inclusion criteria:
  - Deployed to a combat theater since 2001
  - Registered nurse (medical-surgical, emergency, critical care), certified registered nurse anesthetist (CRNA), or medic (technician or licensed vocational nurse)
- Intelink.gov survey platform

Results

- Of 22,337 emails sent, there were 1,181 respondents (5.3% response rate); 696 (58.9% of respondents) met inclusion criteria

Characteristics of the Participants

	n	%
Total Participants	696	100.0
Male	517	74.3
Age		
18 - 24 years	95	13.6
25 - 34 years	329	47.3
35 - 44 years	204	29.3
45 - 54 years	64	9.2
55 - 64 years	4	0.6
Rank		
E-1 to E-4	137	19.7
E-5 to E-6	264	37.9
E-7 to E-9	66	9.5
O-1 to O-3	140	20.1
O-4 to O-6	89	12.8
Active Duty	644	92.5
Area of Concentration or Military Operational Specialty		
Combat Medic	382	54.9
Critical Care Nurse	62	8.9
Emergency Nurse	37	5.3
Flight Medic	33	4.7
License Vocational Nurse	26	3.7
Medical/Surgical Nurse	66	9.5
Nurse Anesthetist	55	7.9
Other	35	5.0
Number of Deployments		
1	269	38.6
2	212	30.5
3	115	16.5
4	58	8.3
5 or more	42	6.0
Location of Most Recent Deployment		
Afghanistan	364	52.3
Africa	13	1.9
Iraq	198	28.4
Kosovo	7	1.0
Kuwait	59	8.5
Syria	17	2.4
Other area (Middle East)	18	2.6
Other area (global)	20	2.9

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Air Force	Air Force Expeditionary Medical Skills Institute (AFEMSI)	Center for Sustainment of Trauma and Readiness (C-STARS)	University of Cincinnati Medical Center, Cinncinati, OH
Air Force		Center for Sustainment of Trauma and Readiness (C-STARS)	University of Cincinnati Medical Center, Cinncinati, OH
Air Force	Air Force Expeditionary Medical Skills Institute (AFEMSI)	Center for Sustainment of Trauma and Readiness (C-STARS)	University of Baltimore R. Adams Cowley Shock Trauma Center, Baltimore, MD
Air Force	Air Force Expeditionary Medical Skills Institute (AFEMSI)	Center for Sustainment of Trauma and Readiness (C-STARS)	St. Louis University Medical Center, St. Louis, MO
Air Force		United States Air Force School of Aerospace Medicine (USAFSAM)	Wright Patterson AFB, OH
Army	Army Trauma Training Center	Ryder Trauma Center	Miami, FL

Army	AMEDD Center and School	Defense Medical Readiness Training Institute	Joint Base San Antonio, Camp Bullis, TX
Army	AMEDD Center and School	Defense Medical Readiness Training Institute	Joint Base San Antonio, Camp Bullis, TX
Army	AMEDD Center and School	Defense Medical Readiness Training Institute	Joint Base San Antonio, Camp Bullis, TX
Army	AMEDD Center and School	Defense Medical Readiness Training Institute	Joint Base San Antonio, Camp Bullis, TX
All	AMEDD Center and School	Defense Medical Readiness Training Institute	Joint Base San Antonio, Camp Bullis, TX- Wilfor Hall SAMMC South, also Navy Medical Center, San Diego, CA
Civilian/ Military	RUSH University		Chicago, IL
NATO-UK Airforce			University of Surrey, Surrey, UK

Navy	Navy Special Operations Medical Instititute	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
Navy	Navy Medicine Operation Training Center (NMOTC) Detachment	Navel Expeditionary Medical Training Institute (NEMTI)	Marine Corps Base Camp Pendelton, CA
Navy	Navy Trauma Training Center		Los Angeles, CA
Navy	Navy Medicine Operation Training Center (NMOTC) Detachment	Navel Expeditionary Medical Training Institute (NEMTI)	Marine Corps Base Camp Pendelton, CA
Army	AMEDD Center and School	Ft. Sam Houston	Ft. Sam Houston, TX
NATO/Army	Joint Warfighter Center	DMRTI	Camp Bullis, TX

NATO/Army	Joint Warfighter Center	DMRTI	Camp Bullis, TX
Civilian	National Association of Emergency Medical Technicians (NAEMT)	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	National Association of Emergency Medical Technicians (NAEMT)	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Army	National Association of Emergency Medical Technicians (NAEMT)	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Army	AMEDD Center and School	US Army School of Aviation Medicine (USASAM)	Ft. Rucker, AL

Army	AMEDD Center and School	US Army School of Aviation Medicine (USASAM)	Ft. Rucker, AL
Army		Joint Readiness Training Center (JRTC)	Fort Polk, LA
Civilian	AMEDD Center and School	Ft. Sam Houston	Ft. Sam Houston, TX

Civilian	Society of Trauma Nurses in cooperation with the American College of Surgeons committee on Trauma	Various universities	Various
Army	American Burn Association	Various universities	Various
Army	AMEDD Center and School	Ft. Sam Houston	Ft. Sam Houston, TX
Civilian	AMEDD Center and School	Ft. Sam Houston	Ft. Sam Houston, TX

All	American College of Surgeons	Multiple (Universities)	Multiple
	AMEDD Center and School	Ryder Trauma Center, AMEDD (varies)	Miami, FL; San Antonio, TX (varies)
Joint	Society of Critical Care Medicine	Multiple (CSTARS, SAMMC, Walter Reed, etc.)	Multiple

		DMRTI	Ft. Sam Houston, TX
Joint	Center for Disaster and Humanitarian Assistance Medicine	USUHS, multiple	Multiple
Joint	Defense for Health Affairs-Force Health Protection and Readiness	DMRTI	Ft. Sam Houston, TX Madigan AMC

Navy		DMRTI	Ft. Sam Houston, TX
Civilian		Strategic Operations	San Diego, CA
Civilian	National Center for Medical Readiness	Calamityville	Fairborn, OH
Civilian	American College of Surgeons	Multiple (Universities)	Multiple
Civilian	American College of Surgeons	Multiple (Universities)	Multiple
Civilian	American College of Surgeons	Multiple (Universities)	Multiple

Civilian	American College of Surgeons	Multiple (Universities)	Multiple
Civilian	National Disaster Life Support Foundation, Inc.	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple
Civilian	American Academy of Pediatrics, and the American College of Emergency Physicians	Multiple (universities, medical facilities, online course available)	Multiple
Civilian	AdventureMed (Endorsed by the Wilderness Medical Society)	Multiple (international, most within an outdoor nature preserve or national park district)	Multiple

Civilian	National Disaster Life Support Foundation, Inc.	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple
Civilian	American Academy of Pediatrics	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple

Civilian	American Academy of Pediatrics	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple
Civilian	National Disaster Life Support Foundation, Inc.	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple
Civilian	International Trauma Life Support	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)

Civilian	International Trauma Life Support	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	International Trauma Life Support	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	International Trauma Life Support	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	International Trauma Life Support	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	American Heart Association	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple

Civilian	National Association of Emergency Medical Technicians (NAEMT) and American College of Surgeons Committee on Trauma (ACS/COT)	Multiple (civilian sites, medical facilities, emergency facilities, universities)	Multiple (international)
Civilian	Wilderness Medical Associates International	Multiple	Multiple
Civilian	National Outdoor Leadership School - Wilderness Medicine Institute	Multiple	Multiple
Civilian	National Outdoor Leadership School - Wilderness Medicine Institute	Multiple	Multiple
Civilian	National Outdoor Leadership School - Wilderness Medicine Institute	NOLS sites	Multiple
Army	Remote Medical International	Various	Lake Diablo, WA or Alanson, MI

Navy	Remote Medical International	North Cascades Environmental Learning Center	Lake Diablo, WA
Navy	Remote Medical International	Custom	Private, on-site team training
Army	Rural Emergency Medical Education	Custom	Private, on-site team training
Army	US Army Special Operations Command (USASOC)	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
Army	Navy Special Operations Medical Inistitute	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
Army		Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC

Army/NATO	US Army Special Operations Command (USASOC)	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
NATO-UK	US Army Special Operations Command (USASOC)	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
Army	US Army Special Operations Command (USASOC)	Joint Special Operations Medical Training Center (JSOMTC)	Ft. Bragg, NC
Army	SOCOM	Joint Special Operations University	MacDill AFB

Army	NATO		Ft. Sam Houston, TX Belgium
Army			
Army	AMEDD CS	Ft. Sam Houston TX and other designated universities/ locations TBD	San Antonio TX and other designated universities/ locations TBD
Army	AMEDD CS	Ft. Sam Houston TX and other designated universities/ locations TBD	San Antonio TX
Army	AMEDD CS	Ft. Sam Houston TX	San Antonio TX
Army	AMEDD CS	Ft. Sam Houston TX	San Antonio TX
Army	AMEDD CS	Ft. Sam Houston TX and other designated locations	San Antonio TX and other designated locations
Air Force	AMEDD CS	SAMMC	San Antonio TX
Air Force	AMEDD CS	SAMMC	San Antonio TX
Navy	AMEDD CS	SAMMC	San Antonio TX

Navy	AMEDD CS	Ft. Sam Houston TX	San Antonio TX
Navy	HQ AFDC/CC		
Navy	Emergency Nursing Association		
Navy		Navy Medicine Operational Training Center (NMOTC)	
Navy			
All			
Navy			
Navy		Navy Trauma Training Center (NTTC)	

Army	Uniform Services University		
Navy	DMRTI		
Navy			
Navy		Navy Medicine East (NME)/Navy Medicine West (NMW) Wounded Ill and Injured (WII)	
Navy			
Navy	Navy Knowledge Online		
Navy	Navy Knowledge Online		
Navy	Navy Knowledge Online		
Army	Parent command or NEMTI		
		1. ATTC, 2. Society of Militayr Orthopedic Surgeons Conference	
Navy			
Navy			
Navy	US Army School of Aviation Medicine	Navy Registration through NMOTC	Ft. Rucker, AL
Navy	US Army School of Aviation Medicine		Ft. Rucker, AL
Navy			

Army			
All			Field Medical Training Battalions at Camp Pendelton and Camp Lejeune
All	US Army Medical Department (AMMED)		
All			
All	AMEDD Center and School	Multiple (AMEDD Phase 1, other Phase 2)	Multiple
All		Tier 1 Group	Memphis, TN
All		Tier 1 Group	Memphis, TN

All		Tier 1 Group	Memphis, TN
All		Tier 1 Group	Memphis, TN
All		Tier 1 Group	Memphis, TN
All		Tier 1 Group	Memphis, TN

All		Tier 1 Group	Memphis, TN
All (Army, Navy, Air Force, Marine)		Tier 1 Group	Memphis, TN
Civilian		Tier 1 Group	Memphis, TN

Civilian		Tier 1 Group	Memphis, TN
Civilian		Tier 1 Group	Memphis, TN
All	U.S. Special Operations Command	Multiple	
#REF!	Board of Certification for Emergency Nursing	Multiple	Multiple

Air Force	University of Maryland Baltimore County	University of Maryland Baltimore County	UMBC, or Augusta University Center of Operational Medicine, or Center for Emergency Medicine of Western Pennsylvania (Pittsburgh)
Air Force	Arizona Emergency Medicine Research Center, University of Arizona College of Medicine, American Academy of Clinical	Multiple	Multiple
Air Force	USSOCOM, Prolonged Field Care Working Group		
Air Force	#REF!	#REF!	#REF!

General Course Information	
Course Name	**Course Description**
Critical Care Air Transport Team Advanced Course (CCATT)	Created to enable Air Force health care providers to refresh their skills by working side-by-side with their civilian colleagues treating trauma and critical care patients.Initiative that places fully trained Active Duty Air Force, Air Force Reserve, and Air National Guard nurses, technicians, and physicians in civilian trauma centers that care for large numbers of trauma and critical care patients.
Tactical Critical Care Evacuation Team Course (TCCET)	The instructional design for the course is Group/Lockstep. The course provides knowledge and skills to perform TCCET UTC specific clinical duties coincident with students' anticipated responsibilities during critical care transports. Focuse on process of stabilization and preparation of critically illed patients in a Level 1 Trauma Center, to apply learning to the TACEVAC environment.
CCATT Course	
CCATT Course	
Critical Care Air Tranport Team (CCATT) Initial Course	Designed to prepare Active Duty (AD), Air National Guard (ANG), or Air Force Reserve Command (AFRC) commissioned officers and enlisted personnel performing CCAT duties to meet the wartime and peacetime missions of caring for critically ill and injured patients in the aeromedical evacuation environment.
Army Trauma Training Course (ATTC)	17-day training rotation for Army Forward Surgical Teams (FSTs) and slice surgical elements of other Table of Organization and Equipment (TO&E) medical units. The primary focus throughout the elements of the ATTC POI is FST clinical team development.

Combat Casualty Care Course (C4)	A tri-service medical readiness training course emphasizing interoperability and joint doctrine concepts. This training is intended as initial and sustainment of TC3 with Prolonged Field Care of casualties. C4 prepares tri-service medical officers with the knowledge critical in conducting Role I & II healthcare operations in an austere, combat environment.
Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	Sponsored by the American College of Surgeons, (ATLS) prepares physicians to identify and respond to life-threatening traumatic injuries. The ATLS-OE course provides students with knowledge of the healthcare environment under military operations.
Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	The PHTLS curriculum covers the pathophysiology and kinematics of injury, providing a basis for rapid assessment and treatment of the trauma patient and a standardized management method for prehospital care of the multisystem trauma patient.
Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	Sponsored by the Emergency Nurses Association, The course enhances the nurse's ability to assess, rapidly and accurately, the patient's responses to trauma. The didactic portion of the course provides information regarding common mechanisms of injury, pathophysiology, assessment, intervention, and reassessment. The clinical portion gives the learner an opportunity to practice assessment skills in a simulated environment. The course offers 14.42 contact hours.
Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	Establishes combat trauma training competencies and coordinates training to develop and sustain DoD trauma surgeons whether located in an operational environment, military MTF or at a Level I trauma treatment facility.
Advanced Trauma Training Program (ATTP)	Courses are available for military and civilian health care personnel, with training conducted at various hospitals in Chicago, instructed by Board Certified Emergency Room Physicians. Courses vary by length (2, 3, 6, 11 day courses) and instruction centers on didactic content, clinical labs, simulation and practical level one trauma experiences.
CCAT Foundational Level	Designed for doctors, nurses and paramedics who act as aeromedical escorts or flight medical crew, and others who work in the field of retrieval and transport of the ill and injured by air.

Special Operations Independent Duty Course	(SOIDC) is to train and qualify selected Petty Officers in the advanced skills and knowledge required to perform duties as a SEAL medic or a Force Reconnaissance Hospital Corpsman.
Expeditionary Medical Unit Training	Pre deployment training for members deploying as an Individual Augmentee (IA) to Role II and Role III assignments in Afghanistan. The curriculum is based on USCENTCOM AOR A-11 and BUMED requirements for personnel deploying in support of Overseas Contingency Operations and meets the pre-deployment trauma training standards set by the DMRTI Combat Trauma Surgery Committee.
Navy Trauma Training Course (NTTC)	To provide an intense 30-day clinical experience in trauma management to Navy medical teams who will be deploying in support of Navy and Marine forces.
Tactical Combat Casualty Care Provider	Designed to provide personnel with the knowledge and skills to provide medical care in a combat environment following the principles of trauma life support and the guidelines and mission of Tactical Combat Casualty Care. Topics place an emphasis on emergency medical care, evacuation and treatment of shock.
Joint Forces Combat Trauma Management Course (JFCTMC)	The curriculum for the Joint Forces Combat Trauma Management Course is based upon the injury patterns of combat casualties and the constraints to deliver medical care on the battlefield and in urban warfare. Students will train on the concepts of combat medical care given realistic scenarios to include equipment, supplies and evacuation capabilities during combat.
Tactical Combat Casualty Care - All Combatants (TC3-AC)	This 1-day course is designed to give non-medical units or MTFs the ability to register for a Mobile Training Team (MTT) TCCC-AC course and receive training in-person. At the completion of the course, training managers at DMRTI can graduate the student and produce a certificate of training demonstrating course completion. The course is taught by NAEMT TCCC affiliate faculty and adheres to the TCCC standard set forth by the Joint Trauma System and the Committee on Tactical Combat Casualty Care.

Tactical Combat Casualty Care - Medical Providers (TC3-MP)	This 3-day course is designed to give medical Service Members the ability to register for a RESIDENT TCCC-MP course and receive training in-person. At the completion of the course, training managers at DMRTI can graduate the student and produce a certificate of training demonstrating course completion. The course is taught by NAEMT TCCC affiliate faculty and adheres to the TCCC standard set forth by the Joint Trauma System and the Committee on Tactical Combat Casualty Care.
Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	The Tactical Combat Casualty Care (TCCC) course introduces evidence-based, life-saving techniques and strategies for providing the best trauma care on the battlefield. The TCCC-AC (TCCC for All Combatants) course is designed for non-medical military personnel and includes first responder skills appropriate for soldiers, sailors, airmen and marines.
TC3-MP	The TCCC-MP (TCCC for Medical Personnel) course is designed for combat EMS/military personnel, including medics, corpsmen, and pararescue personnel deploying in support of combat operations.
Tactical Emergency Casualty Care (TECC)	The TECC course is designed for civilian EMS practitioners who need tactical EMS training allowing them to effectively respond to a mass casualty or active shooter event. The course teaches lessons learned from military experiences and applies them to the civilian world of tactical medicine
Joint Enroute Care Course (JECC)	To provide concise, realistic, relevant and current enroute trauma transport team training to Joint and Coalition Forces Flight Medics, Registered Nurses, Physician Assistants and Physicians conducting aeromedical operations in rotary wing platforms to ensure optimal enroute patient outcomes. Objectives are to provide concise and relevant didactic content, realistic battle-focused lab content, mobile training team short-course, real-time lessons learned, internet-based center for feedback from students and SMEs.

Flight Medic Course (FMC)	The Flight Medic Course (FMC), No. 300-F6, is a 5-week course designed to train enlisted medical personnel in the skills necessary to perform as a Flight Medical Aidman aboard Army air ambulances. To provide qualified combat medics trained to treat, stabilize, and provide in-flight medical care to the critically injured or ill while being transported aboard air ambulances during peacetime and combat operations.
JRTC - Combat Training Center (CTC) Program	Conducts force-on-force and live-fire training in a Joint scenario across the range of conflict using an LVC training model as portrayed by a professional OPFOR and controlled by an expert and experienced OPS GRP. Training occurs under tough, realistic, combat-like conditions across a wide range of likely tactical operations and MREs capable of full integration into higher-level exercises and scenarios. A typical training scenario at JRTC includes a brigade-sized joint task force deploying to the fictional island of Aragon to support the friendly nation of Cortina. In addition to the approximately 3,500 troops supporting the brigade, there are also approximately 1,500 troops supporting echelons above division (EAD) units during a normal rotation. These EAD units usually include a combat hospital as well as a corps support group
Tactical Combat Medical Care (TCMC)	This course is designed to provide the Physician Assistant, Physician, Nurse Practitioner and senior medical NCO a practical working knowledge of how to deal with the injured patient in a combat environment. The course information will be based on known trauma resuscitation methods, lessons learned from past and current combat environments and from newly developed technology. Training will consist of didactic lecture and handson practical training. The topics include the initial assessment of the patient, specific trauma injuries, environmental injuries and emergency surgical procedures as it applies to the combat casualty. The course is centrally funded for all active duty service members. The course is aimed at the care provided at levels I/II. The course will offer new ideas on class VIII options and management during the post-resuscitation period prior to evacuation. Upon successful completion of the program, the Physician /Physician Assistant student will be authorized to claim a maximum of 50 hours of Cat I CME approved by CME Resources.

Advanced Trauma Care for Nurses (ATCN) with ATLS	Compared to TNCC: TNCC is a core information course, foundation for future trauma care education. ATCN is a more advanced program for experienced trauma nurses, involves more critical thinking. Advanced Trauma Care for Nurses (ATCN) is an advanced course designed for the registered nurse interested in increasing his/her knowledge in management of the multiple trauma patient. The ATCN course is taught concurrently with the American College of Surgeons (ACS) Advanced Trauma Life Support® (ATLS). This course was developed to teach established standards on trauma care and practical lifesaving skills. This course is designed for the nurse working in emergency departments, intensive care units, the prehospital setting or any department related to trauma care.
Advanced Burn Life Support (ABLS)	This live, hands-on courese is designed to provide the "how-to" of emergency care of the burn patient through the first 24 hour critical time period. Following a series of lectures, case studies are presented for group discussions. An opportunity to work with a simulated burn patient to reinforce the assessment, stabilization, and the American Burn Association transfer criteria to a Burn Center will be provided. Testing consists of a written exam and a practical assessment.
Brigade Combat Team Trauma Training (BCT3)	The five-day BCT3 is for combat medics assigned to brigade combat teams. The training focuses on tactical combat casualty care, which includes controlling bleeding, treating chest wounds and their associated problems, and clearing airway obstructions.
Military Transition Team Medical Course (MiTT)	The MiTT training is for the team's medical NCO. MiTTs are teams of 12 to 20 Soldiers who are imbedded with Iraqi or Afghan security forces as trainers and advisers. The eight-day training covers tactical combat casualty care as well as working as an independent medical provider. This course provides the NCO an overview of what is necessary to operate as a medic in a remote or isolated hostile environment. The Military Transition Team course reinforces critical skills and knowledge required of the Medical NCO with primary duties that deliver both emergency and routine medical care.

Advanced Surgical Skills for Exposure in Trauma (ASSET)	A course manual is distributed to students prior to taking the course to provide an overview of key surgical exposures in five key anatomic areas: neck, chest, abdomen and pelvis, and upper and lower extremities. The one-day cadaver-based course follows this modular, body region approach. Each section begins with a short case-based overview, followed by a hands-on exposure performed by students under the guidance of faculty.
Combat Extremity Surgery Course (CESC)	AMEDD active duty and reserve component Orthopedic, General, and Vascular surgeons and surgical residents in training are presented a curriculum which details the resuscitation, stabilization, and management of battlefield extremity injuries. During this 2-3 day course, emphasis is placed on initial management and stabilization of patients with extremity war injuries. Focus is surgical care provided at the FST and CSH levels of care and Navy and Air Force equivalents prior to evacuation out of theater. Didactic and hands-on cadaveric laboratory training on extremity fasciotomies, external fixation, revascularization, limb amputation, and limb salvage techniques in the theater of operations is also provided. Emphasis is also directed toward the soft tissue reconstruction (limb-salvage) of host-national patients receiving their definitive surgical care from the US military in the theater of operations.
Pediatric Fundamentals of Critical Care Support (PFCCS)	Updated with the latest knowledge in pediatric critical care, this two-day comprehensive course addresses fundamental management principles for the first 24 hours of post-resuscitation management of the critically ill pediatric patient until transfer or appropriate critical care consultation can be arranged. PFCCS prepares non-intensivists, nurses, and critical care practitioners to deal with acute deterioration of critically ill pediatric patients. The course also assists the non-intensivist in handling the sudden decline of a previously stable patient and prepares house staff for PICU coverage.

Joint Medical Operations Course (JMOC)	JMOC is a five-day course that provides training in joint and combined operational and medical planning that will span the operational environment from point of injury/illness to the appropriate capability of care across the full spectrum of military operations. JMPC familiarizes students to the Joint Operational Planning and medical planning process; policy guidance and information relevant to planning, and Joint Staff publication to include Joint Publication 4-02, Health Services Support, and CJCSM 3122.03C, Joint Operations Planning and Execution (JOPES), Vol II.
Military Medical Humanitarian Assistance Course (MMHAC)	MMHAC was created with the explicit goal of providing training for military primary care providers in preparing for and executing appropriate medical care to civilian populations in the austere health emergency setting. The content of this two day course focuses on understanding the unique health environment, and recognizing and managing those conditions consistently associated with high mortality among the most vulnerable populations (primarily children) in these settings: diarrhea and dehydration, malnutrition, epidemic measles, malaria, and respiratory infections. Course scenarios focus on the role that US military medical assets would likely play as early responders to a humanitarian emergency with limited medical resources.
Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	In 2002, the Joint Staff and the Deputy Assistant Secretary of Defense for Health Affairs-Force Health Protection and Readiness tasked DMRTI to develop Chemical/Biological (CB) medical training requirements and assess the effectiveness of the training with rigorous proficiency metrics and standards. Emergency Preparedness and Response Course (EPRC) meets the training requirement. EPRC consists of four levels (Basic Awareness, Operator/Responder, Clinician's, and Executive/Commander's Course) targeted to a student's profession/job description. Initial training should be completed within 12 months of being assigned to first permanent duty station. Sustainment training is required for all members every three years after completing initial training.

Public Health Emergency Management (PHEM)	The PHEM Training Program will provide PHEOs and MEMs with the knowledge and skills they need to ensure that the DoD is ready to respond to public health emergencies and assist civilian and host nation authorities when called upon. This standardized, joint offered will ensure that PHEOs and MEMs can operate in a variety of environment including other Service's installation and facilities, an issue of increasing concern due to Joint Basing Initiatives. Upon completion of the training, personnel should have the knowledge and/or training to enable them to perform critical tasks needed to meet real-world requirements.
Shipboard Surgical Trauma Training (S2T2)	
*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	The facility offers programs dedicated to improving individual and community-wide readiness, response, and recovery from emergencies and disasters via education, training, modeling, simulation, consulting, management, research, testing and evaluation. NCMR provides unique curricula with an integrated delivery (off-site/on-line distance learning paired with hands-on training in a resident environment, culminating in hands-on practical application training in a tough environment).
Advanced Trauma Life Support (ATLS)	Several formats of the course are available: the student course teaches medical core content in an interactive format with hands-on skills sessions in simulated trauma settings; the refresher course (required every four years) provides updates and changes to protocols with content overview, triage scenarios, along with written and practical tests; an instructor course teaches doctors how to teach the ATLS student course at specific ACS-determined facilities
Advanced Trauma Operative Management (ATOM)	The course offers an effective method of increasing surigical competence and confidence in the operative management of penetrating injuries to the chest and abdomen; students in the course are asked to identify traumatic injuries, develop a plan to surgically repair them and be able to describe proper operative techniques
Rural Trauma Team Development Course (RTTDC)	One-day course emphasizing a team approach to the initial evaluation and resuscitation of the trauma patient at a rural facility and assisting health care professionals in determining the need to transfer the patient to a higher level of care; the course includes interactive lectures on both medical procedures, communication strategies and three team performance scenarios

Disaster Management and Emergency Preparedness (DMEP)	One-day course with didactic and interactive components that addresses core compentencies as outlined by ACS COT Disaster and Mass Casualty Management Committee. Major topics addressed include planning, triage, incident command, injury patterns and pathophysiology, and considerations for special populations
Advanced Disaster Life Support (ADLS)	Intense course focusing on mass casualty management competency through five interactive lectures (Disasters and Public Health Emergencies, Triage, Health System Surge Capacity, Community Health Emergency Operations and Response, and Legal and Ethical Issues in Disasters). Training components include population scenarios discussion, mass casualty triage tabletop and situational training exercises, surge tabletop scenario for health care facilities, personal protective equipment skills performance and decontamination review, casualty management in small groups with simulated scenarios and emergency operations center situational training exercise. This course is the application of the knowledge obtained in the CDLS and BDLS courses
Advanced Pediatric Life Support (APLS)	APLS is the curriculum in pediatric emergency medicine. The certification course is typically presented in one or two (7 hour) days and consists of didactic sessions, small group discussions and skill stations that allow hands-on practice of learned skills under faculty supervision. The participants in the course receive a resource manual to study prior to taking the course (30-days in advance), and the course concludes with a certification examination that must be passed with a minimum score of 80%.
Advanced Wilderness Life Support (AWLS)	An intensive 3-day course designed for healthcare professionals to augment their training and knowledge and allow them to convert their knowledge into a limited resource (wilderness) environment. The goal of the training is that the provider learns the skills to prevent medical problems, reduce suffering, and save lives in a non-traditional medical setting

Basic Disaster Life Support (BDLS)	The BDLS course is designed to engage participants through interactive scenarios and group discussion. The overarching aim of the course is to teach a common lexicon, vocabulary, and knowledge base for the clinical and public health management of all ages and populations affected by disasters and public health emergencies, through a standardized curriculum that is practical and relevent for all health professionals. Knowledge gained in the course can be reinforced and expanded through application in Advanced Disaster Life Support (ADLS) course. This BDLS course is aimed at a broad audience that shares a common likelihood of providing clinical care and assistance to casualties during a disaster or public health emergency, including healthcare, public health and allied health professionals, emergency medical services personnel and other medical first responders and receivers. The competency-based, awareness level course that introduces concepts and principles to prepare health professionals for the management of injuries and illnesses caused by disasters and public health emergencies. The course builds upon, applies and reinforces information presented in the Core Disaster Life Support (CDLS) course. BDLS focuses on the application of core principles and concepts in emergency management and public health as introduces in the CDLS course through the PRE-DISASTER Paradigm and DISASTER Paradigm.The primary focus is the incorporation of an "all-hazards" approach to mass casualty management and population-based care accross a broad range of disasters. Measures to ensure and enhance health workforce readiness are
Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	PEPP curriculum is designed to teach prehospital professionals how to better assess and mange ill or injured children. The course is comprehensive, innovative and highly visual and features case-based lectures, live action video, hands-on skills stations and small group scenarios. The participants learn a portion of the course through self-directed online modules, and then attend a 1-day onsite course for completion of hands-on practice, as well as instructor interaction and the final examination. The course can also be taught completely onsite.

Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	PEPP curriculum is designed to teach prehospital professionals how to better assess and mange ill or injured children. The course is comprehensive, innovative and highly visual and features case-based lectures, live action video, hands-on skills stations and small group scenarios. The participants complete a series of online modules prior to attending a short onsite course for completion of hands-on practice with instructor interaction and the final examination. The course can also be taught completely onsite.
Core Disaster Life Support (CDLS)	Competency-based, awareness-level course that introduces clinical and public health concepts and principles for the management of disasters and public health emergencies. The aim of the course is to provide participants with a common lexicon, vocabulary and knowledge in disaster-related medicine and public health that can be reinforced and expanded in BDLS and ADLS courses.
International Trauma Life Support Basic (ITLS Basic)	A 16-hour course offering both didactic and hands-on skills training covering trauma management protocols, in order to provide participants with the fundamental knowledge and experience necessary to get the trauma patient from scene to surgery in the best possible condition. The course focuses on the skills necessary to recognize mechanisms of injury, perform an organized, time-efficient assessment, prioritize and perform critical interventions and appropriately package and transport the trauma patient. A major focus of the course is the identification of conditions that require immediate transport in order to save the patient. Lifesaving tequniques are taught and provided when possible, to allow the students to become familiar with state-of-the-art techniques and equipment. Participants sit for the certification exam at the conclusion of the course

International Trauma Life Support Advanced (ITLS Advanced)	A 16-hour course offering both didactic and hands-on skills training covering trauma management protocols, in order to provide participants with the fundamental knowledge and experience necessary to get the trauma patient from scene to surgery in the best possible condition. The course focuses on the skills necessary to recognize mechanisms of injury, perform an organized, time-efficient assessment, prioritize and perform critical interventions and appropriately package and transport the trauma patient. A major focus of the course is the identification of conditions that require immediate transport in order to save the patient. Lifesaving tequniques are taught and provided when possible, to allow the students to become familiar with state-of-the-art techniques and equipment. Participants sit for the certification exam at the conclusion of the course
International Trauma Life Support Pediatric (ITLS Pediatric)	This 8 hour course focuses on the special needs of young trauma patients, and covers the principles of proper assessment, management, critical interventions, patient packaging, and rapid transport. Practical skills such as communication techniques with young patients will also be covered.
International Trauma Life Support Access (ITLS Access)	This 8-hour course teaches skills that are critical for EMS crews and first responders at the scene of a motor vehicle collision. Participants learn how to reach, stabilize, and extricate trapped victims, with a special focus on patient care during extrication. The course also covers the proper use of hand tools and items found on the scene or carried in an ambulance or first responder unit, instead of hydraulics. Material covers traditional vehicles, hybrid vehicles, trucks, buses and small aircraft.
International Trauma Life Support Military (ITLS Military)	The 16- hour program combines the fundamentals of ITLS trauma assessment and treatment with recent military innovations utilized in the world's current war zones by adapting proven techniques taught in the civilian ITLS course to the military environment where limited resources are the rule, not the exception.
Pediatric Advanced Life Support (PALS)	Classroom and video-based, instructor-led course that uses as series of simulated pediatric emergencies to reinforce the important concepts of a systemic approach to pediatric assessment, BLS, PALS treatment algorithms, effective resuscitation techniques and team dynamics.

Prehospital Trauma Life Support - Provider (PHTLS)	The course aims to improve the quality of trauma care and decrease mortality. Offered in several levels - basic, advanced, combined and military focused, it can be in a traditional onsite setting, or a hybrid format - didactic material is taken online, and the skill station portion done in person.
Wilderness Advanced Life Support (WALS)	A 36-hour course run over 4-5 days, open to certified or licensed advanced level medical practitioners involved in rescue, mass casualty, and remote outdoor environments or urban areas in disaster or crisis. The constatnly-evolving course is highlighted by discussions of new and innovative ideas and the appropriate application of technologies
Wilderness Medicine for the Professional Practitioner (WMPP)	A two-day, hands-on intensive course that provides an introduction to critical wilderness medicine skills needed to take care of a patient in an extended care environment
Wilderness Upgrade for Medical Professionals (WUMP)	A five-day, hands-on course that provides intensive learning of wilderness medicine curriculum through case studies and practical scenarios with mock patients. Learning takes place in both the classroom and outdoor settings regardless of weather conditions.
Wilderness Medical Expedition (WME)	Experiential learning course that teaches wilderness medicine during a National Outdoor Leadership School (NOLS) wilderness expedition The course begins at one of the NOLS locations with WMPP course, following a foundational day of wilderness medicine skills and scenarios, participants pack rations and equipment and embark on a week-long expedition with intensive wilderness travel and skills-building experiences. By the conclusion of the expedition, participants will be confident in their ability to respond to an emergency and manage a team in a remote environment
Remote Medicine for the Advanced Provider (RMAP)	The course trains Advanced Life Support (ALS) providers sophisticated life-saving techniques developed specifically for use in challenging and remote environments, giving participants the skills necessary to manage a patient for up to 72 hours

Remote Medicine Upgrade and Certification (RMUR)	Fulfills all of the educational requirements to recertify an EMT, Remote EMT or Medical Care Person in Charge (MCPIC) or to upgrade an EMT to include REMT and MCPIC certifications
Tactical Medicine Awareness Training (TMAT)	The course is specifically designed for professionals with previous tactical training and reviews the Tactical Combat Casualty Care (TCCC) and Combat Lifesaver (CLS) concepts
Comprehensive Advanced Life Support (CALS)	An educational program designed specifically for the emergency medical training needs of rural healthcare teams, combining the concepts contained in many of the other advanced life support courses, providing a customizable, team-based training program uniquely suited for resource-constrained environments
Special Operations Combat Medic Course (SOCM)	The Special Operations Combat Medic (SOCM) Course is a 36-week program of instruction that teaches eight 87-student classes per year. The target audience for SOCM is Army and Navy enlisted service members who hold, or are designated for assignment to a special-operations medical position. The course qualifies these enlisted service members as highly-trained combat medics with the necessary skills and abilities to provide initial medical and trauma care and aptitude to increase team survivability. The goal of the program is to produce competent entry-level Paramedics in the cognitive (knowledge), psychomotor (skills), and affective (behavior) learning domains.
Special Operations Combat Medic Course (SOCM)	Goal is to train and qualify selected enlisted members to manage trauma patients, manage patients prior to medical evacuation, and provide basic medical care to team members.
Special Operations Combat Medical Skills Sustainment Course	Navy graduates of the SOCM and SOIDC course are required to maintain their skill sets, certifications in BLS, ACLS, ATP, and clinical skill sets. Special Operations Combat Medical Sergeants Sustainment Course (SOFMSSC) is a two-week course provided which accommodates all recertification training. The Navy SOCM and SOIDC is required to attend this two-week training bi-annually.

Special Forces Medical Sergeant (SFMS, 18D)	The Special Forces Medical Sergeants (SFMS) Course is a 16 week program of instruction that teaches six classes per year. The target audience for this course is a SOCM-qualified enlisted service member who is currently in the Special Forces Qualification Course. The course qualifies 18D and SARIDC Navy students in the advanced skills and knowledge required to perform as supervised providers in CONUS environments and as independent providers when OCONUS and on mission deployments. Independent provider means the 18D or Navy SARIDC is supervised indirectly after a diagnosis has been made and a treatment plan has been determined.
Special Operations Civil Affairs Medical Sergeant Course	The Special Operations Civil Affairs Medical Sergeant (SOCAMS) Course is a challenging eight-week program of instruction with an emphasis on the assessment, planning, collaboration and execution of routine, emergency, veterinary and preventive medicine civil-military operations as a Civil Affairs Team Medic in collaboration with host nation government and security forces, nongovernmental and civil society organizations, and other U.S. Government agencies. This course is designed to foster critical thinking skills, adaptability and teamwork through didactic instruction, virtual interaction, discussion, and hands-on performance based training relevant to Medical Stability Operations.
Special Forces Medical Sergeant Refresher Course	Brand new course. In March 2016, completed the second pilot course, not yet an official course.
Joint Special Operations Medical Orientation Course (JSOMOC)	This is a five-day survey program was designed for military officers, warrant officers, noncommissioned officers, and U.S. government civilian employees in comparable grades, serving the special operations forces (SOF) community or in direct support of the SOF medical community. The course lessons explain the SOF medical operations concepts and fundamentals of the United States Special Operations Command's (USSOCOM) mission, roles, and capabilities with a focus on medical operations in a joint SOF setting. The lessons also examines operations/plans, current lessons learned, medical intelligence, medical force protection, operational risk assessment, health surveillance, and SOF relevant clinical subjects

Joint Medical Planner Course (JMPC)	The aim of this course is to provide fundamental medical support planning knowledge for medical support planner's appointed to NATO-Multinational Headquarters or as national medical support planners that interact with the NATO Command structure.
HOSPEX Training - Validation Events	Designed for military medical teams who will be deployed incl. doctors, nurses,
300-F1 Flight Paramedic	Instruction will be provided and conducted at a local (Fort Sam Houston/San Antonio) college affiliated EMT-Paramedic training facility.
300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	The Critical Care Clinical Skills course consists of students working in coordination with ICU nurses and physicians in the medical ICU, pediatric ICU, surgical ICU, neonatal ICU, coronary care unit, burn unit and operating room/ PACU in selected facilities.
Paramedic (ASI F2) Recertification Course	This course will provide two-weeks of training required for paramedic recertification to include 72 hours of continuing education units accredited by Army EMS. Additionally, students who are FP-C certified through the Board of Critical Care Transport Paramedic Certification (BCCTPC) will qualify for continuing education units.
Operating Room Specialist Course Phase 1	The 68D10, Operating Room Specialist Course is designed to provide the student with a working knowledge of principles of surgical technology practice, and the instruments, supplies, and equipment for surgical procedures.
Operating Room Specialist Course Phase 2	The 68D, Operating Room Specialist course phase 2 clinical practicum is designed to provide the student with clinical experiences in performing entry level surgical technology skills, while enabling the student to apply theories, concepts, and procedural foundations from phase 1.
Critical Care Nursing Course	The Critical Care Nursing course is 18-weeks of resident training that consist of 9-weeks of consolidated training with the Emergency Nursing course.
Emergency Nursing Course	The Emergency Nursing course is 18-weeks of resident training consisting of 9 weeks of consolidated training with the Critical Care Nursing course.
Management of Burns and Multiple Trauma Course	This course is designed for participants from all AMSC AOCs to enhance their military readiness in the management of Burn and Multiple Trauma casualties.

Oral and Maxillofacial Surgery Course	The purpose of this course is to provide a comprehensive review of the principles and the practice of oral surgery to prepare dental officers for their role in modern warfare
Aeromedical Evacuation (AE)	AE system provides fixed-wing movement of patients requiring supervision by aeromedical evacuation crewmembers to locations offering appropriate levels of medical care. AE system provides (a) integrated control of casualty movement by air transport; (b) clinical and operations support personnel; (c) equipment for in-flight supportive care and ground support operations; (d) critical care ait trasport teams to monitor and manage specific patients requireing intensive care; (e) staging facilities on/in the vicinity for administrative processing and care of casualties
Emergency Nursing Pediatric Course (ENPC)	Established a standardized body of pediatric emergency nursing knowledge to improve care of pediatric patients. The course includes; Initial assessment of medical and trauma care, hands-on training using both an individual and team approach, evidence-based content development. Course includes: Epidemiology, Prioritization (triage and decision making), Initial Assessment, Pain, Common Procedures and Sedation, Medication Administration, Vascular Access, Respiratory Emergencies, Childhood Illness, The Neonate, The Adolescent, Shock, Rythm Disturbances, Trauma, Toxicological Emergencies, Maltreatment, Crisis, Disaster, Stabilization and Transport
Combat Casualty Care Course (C4)	Phase 1 Training-
C4	Phase I Training-
ATLS and ACLS	Phase 1 Training-
ATLS and ACLS	
Navy Trauma Training Course (NTTC)	Phase II or Phase III Training-

Bushmaster Course	
Emergency War Surgery Course (EWSC)	Phase I training-
Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting	Phase 1 training-
Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course	Phase II training-
TBI for Deploying Providers	
Traumatic Brain Injury 201: Overview for Health Care Personnel	
Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)	
Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	
Tactical Combat Casualty Care (TC3)	Phase I Training-Provides standardized training for all trauma care at the point of injury and for tactical evacuation
Combat Extremity Surgery Course (CESC)	Phase 1 Training-
Trauma Nurse Core Course (TNCC)	Phase 1 Training-
ACLS	Phase 1 Training-
Joint Enroute Care Course (JECC)	Phase I or Phase III Training-
Flight Medic Course (FMC)	Phase I or Phase III Training
Emergency Nursing Pediatrics Course	Phase I Training-

Advanced Burn Life Support (ABLS)	Phase I Training-
Field Medical Service Technician (FMST) School	Phase I or Phase III Training
Infection Control in a Deployed Envirnoment (6A0F22)	
Sexual Assualt Medical Forensic Examiner SAMFE	
Interservice Physician Assistant Program (IPAP)	Here all IPAP students complete their 16-month didactic phase of training. Phase 1 consists of basic medical science courses intended to develop a student`s knowledge of critical medical concepts (see Phase 1 curriculum). After completing this portion of the curriculum, students continue with their medical clerkships at one of 22 medical Phase 2 sites across the country. These Phase 2 sites are located at military installations with medical facilities adequate to support the base rotations required to be a successful Physician Assistant (see Phase 2 curriculum). All branches can take this course.
Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)	Meets the training requirements of the National Registry of Emergency Medical Technicians (NREMT) for recertification of the Paramedic and the USSOCOM Advanced Tactical Paramedic certification. Designed to meet the skills sustainment of the EMT-P, as well as senior medics of the military – Army 18D, Air Force Pararescue, Marine Corps Amphibious Reconnaissance Corpsman, Navy IDC and NAVSPECWAR SEAL. The syllabus affords recertification in BLS, ACLS, PALS, TCCC and PHTLS. Full mission profiles can be tailored to meet specific client requirements.
NREMT-Paramedic Recertification Course	Meets the training / continuing education requirements of the National Registry of Emergency Medical Technicians – Paramedic (NREMT-P) and most states for recertification.

Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)	This preparatory course meets the unique needs of Special Operations Medical Operators who desire to increase their scope of knowledge and certifications. This course meets the needs of the Special Operation Forces (SOF) medic and prepares them to successfully pass the Board of Critical Care Transport Paramedic Certification (BCCTPC) FPC/CCP and TACP exam. Upon completion of the course, students will receive a 40 hour continuing Education certificate that satisfies the requirements for NREMT. Students will be taught all necessary subjects required to successfully pass the BCCTPC examinations.
National Registry Paramedic Bridge Course	Meets the needs of the Special Operation Forces (SOF) medic and prepares them to successfully pass the NREMT Paramedic Certification exam. Total online course duration is dependent on participant's application and which course they are enrolled in.
Advanced Combat Trauma Training (ACTT)	Is the Medic to Provider level course based on the CoTCCC course approved by USSOCOM course and designed for the Medic as outlined in the PHTLS manual. While the course meets the outlined requirements, we exceed this by providing additional training to not only treat Point of Injury casualties, but to manage these casualties for up to 24-hours. Extensive scenarios provide situational experience and stress that greatly enhances student learning. 15 Basic/15 Advanced CECBEMS CEU's are provided.
Advanced Combat Medic Course (ACMC)	Is the Advanced Medic level course designed for the experienced medic/corpsman/provider. It provides the advanced medical skills to aid in caring for unit personnel as well as, the combat casualty. It is the perfect course for the medic/corpsman/provider who might be receiving the casualty, assisting in a field clinic/BAS, or has to provide extended care due to MEDEVAC delay.

Prolonged Field Care Course (PFC)	Is the course designed for the Experienced SOF Medic / Corpsman or Provider. The syllabus covers critical care for the medical or trauma patient and the evacuation process while operating in an undeveloped theatre with extended evacuation times. Enhanced capabilities will be derived from interpretation of laboratory, diagnostic, monitoring and pre-mission planning considerations. Advanced management techniques will be addressed as observed in recent theaters and trends throughout various medical communities. In depth instruction of subjects will be through didactic presentations, skills stations, and an extensive culminating practical exercise that will test the material covered. This course can be merged with other unit training in order to involve the entire unit during relevant portions of the training.
Applied Battlefield Medicine (ABM)	Is an intensive hands-on practicum for both medics and operators w/previous TCCC exposure(s). This modular course can be designed to include preset missions from planning through extended care phases of operational assignments. Student skills within their scope of practice, are delivered in challenging and lifesaving real world scenarios such as IED, Opposing Forces, Confined Space Collapsed Structure and / or High Angle Rescue situations requiring the utilization of patient extrication techniques and other highly realistic stressors. This course is best suited for a unit to attend together.
Vehicle Extrication Course (VEC)	This course is designed to introduce, develop, integrate, enhance Operators knowledge, skills and ability to properly perform vehicle entry and extrication post-accident, and tactically during or post attack on the motorcade / convoy. Emphasis is placed upon the proper procedures and systems to perform automobile extrication in a variety of settings and conditions. Students will gain practical experience and apply the necessary skills to operate hand and power tools for the removal of windows, opening of doors, removal of roofs, pulling of steering wheels, moving of foot pedals, raising of dashboards, pulling of seats, stabilization of vehicles, and simulating the rescues of trapped occupants (principal and/ or personnel).

Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	This combined syllabus is provided by SME's primarily Pararescue personnel that have National Fire Protection Association (NFPA) certifications and real world experience in civilian and combat deployments. Standard equipment will be utilized to ensure familiarization and proficiency with gear available on deployments and during training. Basic rigging operations for high angle rescue as well as improvised/ hasty techniques will be covered with demonstrations and practiced by students. The syllabus then proceeds to its next phase of training consisting of Confined Space/Collapsed Structure & Vehicle Extrication where unit organic equipment will be utilized to ensure familiarization and proficiency with gear available on deployments. Basic confined space/collapsed structure and vehicle extrication / rescue skills oriented on safe management / removal of a patient from military / civilian type situations will be provided.
Basic Combat Trauma Training (BCTT)	Is the Operator level course based on the CoTCCC course approved by USSOCOM and designed for the operator as outlined in the Pre-hospital Trauma Life Support (PHTLS) manual. While the course meets the outlined requirements, we exceed this by providing additional training for the burn, blast, and head trauma patients. We put major emphasis on patient assessment skills, concepts, and principles. This course prepares the operator to confidently and effectively apply the life-saving techniques of TCCC. 21 Basic CECBEMS CEU's are provided.
Advanced Tactical Practitioner (ATP)	
Certified Flight Registered Nurse (CFRN) Review Course	The certifcation exam is governed by the BCEN, but the review courses are a separate entity. The review courses are offered by several independed medical education businesses. The courses are desgined to meet or exceed the recommended materials review setforth by BCEN and prepare the participant to sit for the certifcation exam. The courses include test-taking tips as well as review materials pertinent to the exam.

Critical Care Emergency Medical Transport Program (CCEMTP)	The course is designed to prepare paramedics and nurses to function as members of a critical care transport team that manages critical patients during high risk transfers. Upon successful completion of the course, students are considered specialized care providers that have an understanding of all aspects of patient care and can utilize this understanding to provide the highest level of care to critical patients during transport
Advanced Hazmat Life Support (AHLS)	The course teaches healthcare professionals to medically manage patients exposed to hazardous materials, including chemical, biological and radiological incidents. Participants learn to recognize the signs and symptoms of exposure in order to medically manage patients of hazmat incidents.
Intro to Prolonged Field Care	Introductory course for PFC for combat medics (68W). Designed for 68W personnel who are already proficient in TCCC and want to expand their existing skill sets to be able to perform PFC. The intent of Prolonged Field Care (PFC) is to educate medics to employ skills in austere, forward environments (non-mature areas of operation) potentially providing care for 72-96 hours while waiting for medical evacuation/casualty evacuation.
#REF!	#REF!

Course Length	Courses/Year	# of Seats	Cert/Assessment	Responsible Funding Agency
12 days/103hrs	14 classes	12-15 students	RSVs	
5 days/40hrs			2 simulator tests, 2 equipment tests, a written TCCC exam and individual performance reviews.	
10 days			3 written exams. Electronic testing using web-based programs. Exam 1. Altitude Physiology Exam 2. Week 1 content, Exam 3: Cumulative test with skill and hands-on assessment	
2 weeks				

9 days			ATLS, TNCC, PHTLS, NAEMT TC3 certification	
2.5 days			Initial Assessment Testing, Written Test., ATLS	
2-2.5 days				
2-2.5 days			TNCC	
3 days			Post-test/Critiques	
Varies upon module				
6 days				

24 weeks				
3 weeks				
60 hours/1 week	3	125		
1 day	3		Certificate of Training	

3 days	12		Certificate of Training	
1 day	Multiple	Site dependent	TC3-AC	
2 days	Multiple	Site dependent	TC3-MP	
16 hours (2 days)	Multiple	Site dependent	TECC	
2 weeks	4 to 5	35	STX Checklist Written exam Graded practical exams on equipment and Critical Care Transport simulation	

5 weeks			ACLS, ITLS, PEPP certifications. Field Training Exercise (FTX) checklist	
12-16 days	8 rotations, 2 mission readiness exercises per year			
1 week	12	30	Final lane training scenario with group discussion AAR.	

3 days	Many		Certificate of completion	Society of Trauma Nurses
8 hours			Written exam and practical assessment	
5 days	15	120		
8 days				

1 day	20+		Faculty assesses knowledge and technical skills of students during practical lab with exposures using cadavers	
2-3 days	2-3 per year	380 (ATRRS cite)		
2 days			Pre/Post tests Provider certificate	

5 days	4			
2 days			Written exam, round robin skill stations	
Basic: 2 hours Short: 1 day Executive: 1 day	4 to 6		Post test for each module	

5 days				
Custom	custom		custom	
1-2.5 day	20+		ATLS	
1 day	20+		ATOM	
8 hours	20+		RTTDC	

One day	20+		DMEP	
15 hours	20+	Many	ADLS	
14.5 hours total (11.5 hours lecture or small group discussion, 2 hours skill station)	Many	Many	APLS	
3 days	Many	varies upon training site	AWLS	

7.5 hours	Multiple	Varies upon training site	BDLS	
16.75 hours	Many (international)	Varies upon training site	Completion certificate - PEPP ALS/ ALS PEPP	

9.25 hours	Many (international)	Varies upon training site	Completion certificate - PEPP BLS/ BLS PEPP	
3.5 hours	Many	Varies - site dependent	CDLS	
16 hours	Many (international)	Varies upon training site	ITLS-Basic	

16 hours	Many (international)	Varies upon training site	ITLS-Advanced	
8 hours	Many (international)	Varies upon training site	ITLS-Pediatric	
8 hours	Many (international)	Varies upon training site	ITLS-Access	
16 hours	Many (international)	Varies upon training site	ITLS-Military	
Full course:14 hours, Update: 6-8 hours	Many	Variable upon course location	PALS	

16 hours (2 days)	Many	Variable upon course location	PHTLS	
36 hours over 4-5 days	Many	Variable upon course location	WALS	
2 days	Many	Variable upon course location	WMPP	
5 days	Many	Variable upon course location	WUMP	
One week	1-2	Variable	WME	
5 days	3 domestic for 2017, international courses also available	Variable	RMAP	

10 days	2 domestic courses available for 2017	Variable	REMT, MCPIC, CPR	
8 hours/1 day	Custom	Custom	TMAT	
2 days	Custom	no more than 24/session	CALS	
36 weeks	8 classes per year	87 per class	Certifications: EMT-B BLS PEPP ACLS	
26 weeks			USSOCOM EMT Paramedic Exam	
2 weeks				

16 weeks				
8 weeks				
2 weeks				
5 days	2 per year			

1 week	2 per year			
26 weeks, 2 days				
8 weeks, 2 days			Upon completion of the course, students will be eligible to take the Flight Paramedic Certified (FP-C) examination.	
2 weeks				
9 weeks, 1 day				
10 weeks			68D MOS	
9 weeks				
9 weeks				
1 week			opportunity for ABLS certification	

4.5 days				
	11 iterations/yr	24/class (6 MC seats, 3 NC seats and 15 HM seats); PA may fill any of the empty class seats. PA will earn 65 CME credits.		

	4 (once per quarter)			
4 weeks				

8 weeks				
5 days				
29 months	150 students/year		Masters paper. Phase 2 evaluations based on PA competencies. Clinical grade for each rotation (passing 75%). End of rotation examinations (exam is 25% of rotation grade, pass 75%). All students take PANCE for PA national certification.	
84 hours			Recertification for BLS, ACLS, PALS, TCCC and PHTLS. Recertification for Paramedic and the USSOCOM Advanced Tactical Paramedic certification.	
45 hours			NREMT-P recertification	

10 days			Preparation for Board of Critical Care Transport Paramedic Certification (BCCTPC) FPC/CCP and TACP exam	
variable			Written exam for NREMT-P certification	
40 hours				
40 hours				

50 hours				
Customized. 8-40 hours				
4 days				

4 days				
32 hours				
91 hours				
16 hours (2 days)	Many	Site-dependent	Course is independent from exam - must sit for exam in order to obtain CFRN certification	Participants pay for the course

100 hours	Several	Site-dependent	CCEMTP	Participants pay for the course
16 hours (2 days)	Several	Site-dependent	AHLS	Participants pay for the course
3+ days				
#REF!	#REF!	#REF!	#REF!	#REF!

Course Name	Eligible Personnel
Critical Care Air Transport Team Advanced Course (CCATT)	Specifically for personnel assigned to a Critical Care Air Transport (CCATT) Unit Type Code (UTC). All 4H0X1s will attend training at C-STARS Cincinnati regardless of UTC placement
Tactical Critical Care Evacuation Team Course (TCCET)	Designed to provide skills sustainment for Active Duty, Reserve Commissioned Officers and Air National Guard (physicians and nurses) assigned to the TCCET UTC.
CCATT Course	
CCATT Course	
Critical Care Air Tranport Team (CCATT) Initial Course	Physicians: Intensivist (EM physician, Anesthesiologist, Fellowship trained criticat care medicine physician), Non-intensivist (credentialed in a special care unit, Work in Level 2 or higher emergency department, work in post-anesthesia care unit or operating room environment); Nurses: (Work in critical care or special unit, ED, or post-anesthesia care unite withing 2 years of course start date, Must have worked for a minimum of 1 year in one of the above areas); Respiratory Technician: (Must have 1 year critical care experience, recieve annual training in an ICU, worked with ventilator patients within 1 year of course start date)
Army Trauma Training Course (ATTC)	This course has been approved by the Uniformed Services University for 60-hours of Category I CME credit and 58 of CEUs.
Combat Casualty Care Course (C4)	

Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	Students attending C4 have the opportunity to receive certification in Advanced Trauma Life Support (physicians, oral surgeons, dentists, and physician assistants; nurse practitioners may attend as auditors)
Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	Students attending C4 have the opportunity to receive certification in PHTLS. Those with PHTLS certification which expires more than twelve months from the C4 course date may audit the PHTLS course for 16.0 CEUs or opt to attend the ATLS Course or Trauma Nurse Core Course (TNCC) if seating is available
Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	Students attending C4 have the opportunity to receive certification in TNCC. Registered nurses without current TNCC certification or within 12 months of TNCC expiration will attend. Others may attend Pre-Hospital Trauma Life Support (PHTLS) or audit TNCC for 12.42 CEUs.
Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	Professional Medical (intended for general and orthopedic surgeons)
Advanced Trauma Training Program (ATTP)	EMT's/medics, Nurses, Physicians, PA's, RT's
CCAT Foundational Level	
Special Operations Independent Duty Course	Naval Special Warfare Hospital Corpsman, Special Operators, Force Reconnaissance Hospital Corpsman, MARSOC Hospital Corpsman, and Special Warfare Combat Crewmen are eligible upon recommendation and selection from their command after completing Special Operations Medic Course (300-F8).
Expeditionary Medical Unit Training	
Navy Trauma Training Course (NTTC)	

Tactical Combat Casualty Care Provider	
Joint Forces Combat Trauma Management Course (JFCTMC)	Level III Personnel (e.g. Combat Support Hospital)
Tactical Combat Casualty Care - All Combatants (TC3-AC)	
Tactical Combat Casualty Care - Medical Providers (TC3-MP)	
Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	Non-medical military personnel including soldiers, sailors, airmen and marines
TC3-MP	Combat EMS/military personnel (medics, corpsmen, pararescue personnel deploying in support of combat operations)
Tactical Emergency Casualty Care (TECC)	Civilian tactical EMS providers
Joint Enroute Care Course (JECC)	DoD and DHS components, MOS 68WF and assigned to air ambulance company in a 68WF position. Navy Corpsman 8404 and nurses who possess NOBC 0904 or 0906 are eligible.

Flight Medic Course (FMC)	Active Component E-4 to E-5, National Guard/Reserve E-4 to E-6. Qualified MOS 68W minimum of 1 year experience, volunteer for flight duty, must have at least 24 months service time remaining, GT score of at least 107, current and qualified Class 3 Flight Physical.
JRTC - Combat Training Center (CTC) Program	
Tactical Combat Medical Care (TCMC)	Active duty Army, Air Force, Navy, National Guard, Army Reserve. Must be physician assistancs, physicians, dentists, nurses, or physical therapists in the grade of 01-06 pending utilization in their AOC at Level I/II while deployed. Non-commissioned applicants must be combat medics (68W30 or above) assigned as the Treatment NCOIC and accompanied by their unit physician or PA; Special Operations Medics 18D; or 68WW1. Priority given to soldiers within 90 days of deploying to combat zone.
Advanced Trauma Care for Nurses (ATCN) with ATLS	Registered nurses, ideally should be working in Emergency care and treating trauma patients.
Advanced Burn Life Support (ABLS)	Physicians, nurses, physician assistants, nurse practitioners, therapists, paramedics.
Brigade Combat Team Trauma Training (BCT3)	This course is specified for BCTs and those units on orders to deploy. This course must be requested through the Corps or Division HQs to FORSCOM. Attendees must be a National Registry Emergency Medical Technician and must hold the Health Care Specialist 68W MOS.

Military Transition Team Medical Course (MiTT)	This course is available to Active Duty Army, Navy, Air Force, National Guard and Reserve components. The Army Student must hold a primary MOS of Health Care Specialist 68W Medical NCO at Skill Level 20-40 and be NREMT current. They must be in satisfactory physical condition and be able to successfully pass the APFT and meet height/weight standards. They must be on assignment orders to a Military Transition Team. The Air Force Student must possess a medical care Air Force Specialty Code (AFSC). The Navy Student must possess a medical care Navy Enlisted Classification (NEC). All students must be on assignment orders to a Military Transition Team (MiTT), Provincial Reconstruction Team (PRT), or other Transition Team in lieu of an Army Tasking.
Advanced Surgical Skills for Exposure in Trauma (ASSET)	Mid-level and senior surgical residents, trauma and acute care surgical fellows, or any surgeon who wishes to undertake a review of this anatomy
Combat Extremity Surgery Course (CESC)	US Military predeployment preparatory course for Military orthopedic surgeons, PAs, General surgeons, and others who may be required to provide orthopedic care in the deployed environment. Required pre-deployment course for Army, Navy, and Airforce - MOS 61M, 61J, other surgical specialities serving in PROFIS 61M position.
Pediatric Fundamentals of Critical Care Support (PFCCS)	Hospitalists caring for potentially unstable, critically ill or injured pediatric patients Advanced practice nurses and physician assistants with limited pediatric practice Rapid response/medical emergency team members Critical care fellows beginning training Emergency medicine physicians who do not routinely care for pediatric patients Nurses caring or complex and potentially unstable patients Pre-hospital providers with lengthy patient transfer times

Joint Medical Operations Course (JMOC)	Open to Department of Defense (DoD) medical department personnel assigned to Combatant Commanders, Service Headquarters, Joint Task Forces, and joint organizations. United States Government (USG) Interagency and Allied personnel are also eligible to attend. Priority will be granted to field grade officers, senior non-commissioned officers, and DoD civilians that are/will be assigned to Joint Bases/Hospitals or Joint Assignments.
Military Medical Humanitarian Assistance Course (MMHAC)	

Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	Initial training within 12 months of being assigned to first permanent duty station. • Basic Course: For DoD Civilians non-medical/non-security civilian employees and contractors within the Military Healthcare System (MHS). Includes housekeeping, office workers and facility workers. • Operators/Responders Course: All military personal must complete this course unless directed to complete the Clinician's Course. DoD civilians and contractors working within the Military Healthcare System (MHS) providing security support or non-direct patient care. • Clinical Course: Medical Corps, Dental Corps, Nurse Corps, Physician Assistants, Veterinarian Corps, Independent Duty Corpsmen, Independent Duty Medical Technician, Special Forces Medics, DoD Civilian and and Contract Direct Healthcare Providers. • Executive/Commander Course: For military executives and commanders working within the Military Healthcare System (MHS).
Public Health Emergency Management (PHEM)	
Shipboard Surgical Trauma Training (S2T2)	
*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	Variable

Advanced Trauma Life Support (ATLS)	All physicians who care for injured patients
Advanced Trauma Operative Management (ATOM)	Senior surgical residents, trauma fellows, military surgeons, fully trained general surgeons who are not frequently called on to treat penetrating injuries
Rural Trauma Team Development Course (RTTDC)	Individuals who are involved in the care of the injured patient, including physicians, nurse practitioners, physician assistants, nurses, prehospital personnel, technicians and administrative support
Disaster Management and Emergency Preparedness (DMEP)	Acute care providers that are the likely first receivers of casualties following major disasters, other health care providers, administrators, public health personnel, and emergency managers
Advanced Disaster Life Support (ADLS)	Physicians, nurses, physician assistants, emergency medical technicians, paramedics, pharmacists, allied health professionals, and students in health professional schools
Advanced Pediatric Life Support (APLS)	Physicians, residents, interns, fellows, nurses, physician assistants, EMTs

Advanced Wilderness Life Support (AWLS)	EMT, RN, PA, NO, DO, MD
Basic Disaster Life Support (BDLS)	Physicians, Registered or Licensed Practical Nurses, Paramedics or National Intermediate EMTs, Physician Assistants, Allied Health Professionals, Dentists, Pharmacists, Public Health Professionals, Veterinarians, Health Profession Students, First Responders and Mental Health Professionals
Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	AEMT, Paramedic, Nurse, Respiratory Therapist, Physician
Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	EMR, EMT
Core Disaster Life Support (CDLS)	Medical first responders, health professionals, health service providers, public health workers and health support personnel
International Trauma Life Support Basic (ITLS Basic)	EMT-B, EFR, LPNs

International Trauma Life Support Advanced (ITLS Advanced)	EMT-B, EFR, AEMT, paramedics, trauma nurses, physicians, medical students, nurse practitioners, physician assistants; must be able to start IV fluids and perform airway management using a blind insertion device or ET tube
International Trauma Life Support Pediatric (ITLS Pediatric)	EMT-B, EFR, AEMT, paramedics, trauma nurses, physicians, medical students, nurse practitioners, physician assistants; must be able to start IV fluids and perform airway management using a blind insertion device or ET tube
International Trauma Life Support Access (ITLS Access)	EMT-B, EFR, AEMT, paramedics
International Trauma Life Support Military (ITLS Military)	Active military status, appropriate level of clinical privildge equivalent to AEMT, paramedic, trauma nurse or physician; must be able to start IV fluids and perform airway management using a blind insertion device or ET tube
Pediatric Advanced Life Support (PALS)	Physicians, nurses, paramedics and other healthcare providers who respond to emergencies in infants and children

Prehospital Trauma Life Support - Provider (PHTLS)	EMRs, EMTs, Paramedics, nurses, physician's assistants, and physicians
Wilderness Advanced Life Support (WALS)	Physicians, Physician's Assistants, Registered Nurses, EMT-P, EMT-I
Wilderness Medicine for the Professional Practitioner (WMPP)	EMTs, Nurses, Physicians, medical students and other medical professionals
Wilderness Upgrade for Medical Professionals (WUMP)	EMTs, Nurses, Physicians, medical students and other medical professionals

Wilderness Medical Expedition (WME)	EMTs, Nurses, Physicians, medical students and other medical professionals
Remote Medicine for the Advanced Provider (RMAP)	EMTs, Nurses, Physicians, medical students and other medical professionals
Remote Medicine Upgrade and Certification (RMUR)	EMTs, MCPIC
Tactical Medicine Awareness Training (TMAT)	Professionals with previous tactical training
Comprehensive Advanced Life Support (CALS)	Physicians, nurses, physician assistants, nurse practitioners, respiratory therapists, EMT-P

Special Operations Combat Medic Course (SOCM)	Assignment to a USSOCOM Naval or Marine Corps service component command.
Special Operations Combat Medic Course (SOCM)	Naval Special Warfare Hospital Corpsman, Special Operators, Force Reconnaissance Hospital Corpsman, MARSOC Hospital Corpsman, and Special Warfare Combat Crewmen are eligible upon recommendation and selection from their command.
Special Operations Combat Medical Skills Sustainment Course	A SOF volunteer enlisted service member with a primary duty specialty of Special Operations Combat Medic, Navy SEAL & RECON Special Operations Combat Medic (NEC 8492/8427), Navy SEAL and RECON Special Operations Independent Duty Corpsman (SOIDC) (NEC 8491/8403), or an enlisted or officer instructor in the SOCM or SOIDC course and be assigned to one of the following: USSOCOM, JSOC, USASOC, NAVSPECWARCOM, AFSOC, or any of their subordinate units or agencies. Service members must be a graduate of one of the following: the SOCM (300-F8) Course or SOIDC Course. Service members will attend the course once every 2 years to receive Special Operations combat medical refresher training.
Special Forces Medical Sergeant (SFMS, 18D)	
Special Operations Civil Affairs Medical Sergeant Course	
Special Forces Medical Sergeant Refresher Course	
Joint Special Operations Medical Orientation Course (JSOMOC)	Primarily for, but not limited to, military officers, warrant officers, noncommissioned officers, and U.S. government civilian employees in comparable grades, serving the SOF community or in direct support of SOF medical community. International military and civilians whose job requires knowledge of SOF medical operations may be accepted on a case-by-case basis.

Joint Medical Planner Course (JMPC)	Military officers (OF-2 through OF-5) and their civilian equivalents serving in a NATO HQ (Peacetime Establishment & Crisis Eestablishment) Rank requirements: NCO: OR-6 thru OR-9 Officer: OF-2 thru OF-5
HOSPEX Training - Validation Events	
300-F1 Flight Paramedic	
300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	

Paramedic (ASI F2) Recertification Course	
Operating Room Specialist Course Phase 1	
Operating Room Specialist Course Phase 2	
Critical Care Nursing Course	
Emergency Nursing Course	
Management of Burns and Multiple Trauma Course	All Army Medical Service Corp AOCs
Oral and Maxillofacial Surgery Course	Oral Surgeons
Aeromedical Evacuation (AE)	
Emergency Nursing Pediatric Course (ENPC)	
Combat Casualty Care Course (C4)	All Physicians/Oral Surgeons

C4	All Dental Corps officers assigned to outside continguous United States (OCONUS) duty station, operational assignments or to Health Services Augmentation Platforms (HSAP), All nurses, Pas.
ATLS and ACLS	Medical Corps (MC) specific designators established by BUMEDINST 1500.15E.CH-1, Medical Corps officers assigned to HSAP billets, as individual augmentees, or in other contingency billets. All Pas.
ATLS and ACLS	All other Navy Medical Department dentists (active duty, Reserve, civilian, contract)

Navy Trauma Training Course (NTTC)	(Physicians/Oral Surgeons, Nurses, PA, Corpsman) Those assigned to: Forward Resuscitative Surgical System and Shock Trauma Platoon (FRSS/STP), USMC Billets; Other Forward Resuscitative Care/Role 2 Assignments (ie. Fleet Surgical Team (FST))
Bushmaster Course	
Emergency War Surgery Course (EWSC)	Physicians, (Surgeons and Non-surgeons, , Nurses, APRNS, and Physician Assistants) assigned to patient care delivery positions in a Role 1, Role 2 Light Manuever (Forward Surgical Teams); Role 2 plus and Role 3 hospitals

Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting	All Physicians/ Oral Surgeons, Nurses, PA, All deploying HMs (Corpsman)
Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course	All deploying providers (physician, nurse practitioner (NP), PA, nurse, psychologist, occupational therapist (OT), physical therapist (PT), social worker (SW), speech language pathologist (SLP), and PT technician, including deploying dental officers; Nurses: all assigned to theater hospitals/Role2E/Role3 Units,; All deploying HMs.
TBI for Deploying Providers	
Traumatic Brain Injury 201: Overview for Health Care Personnel	
Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)	
Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	

Tactical Combat Casualty Care (TC3)	Physicians/Oral Surgeons/PA: All deploying providers involved in direct patient care deployed to combined joint operations; Nurses: All Advanced Practice Nurses (APNs) and Nurse generalists. All Hospital Corpsman.
Combat Extremity Surgery Course (CESC)	All orthopedic surgeons. All orthopedic PA.

Trauma Nurse Core Course (TNCC)	Nurses: All deployment critical subspecialties (primary, secondary, tertiary) of 1945, 1950, 1960 and 1972
ACLS	Nurses: All deployment critical subspecialties (primary, secondary, tertiary) of 1945, 1950, 1960 and 1972
Joint Enroute Care Course (JECC)	Those assigned to EnRoute Care (ERC) roles/billets
Flight Medic Course (FMC)	Those assigned to EnRoute Care (ERC) roles/billets

Emergency Nursing Pediatrics Course	Nurses: All deployment critical subspecialties (1945s, 1950s, 1960s)
Advanced Burn Life Support (ABLS)	Nurses: All deployment critical subspecialties (1945s, 1950s, 1960s); PA: All
Field Medical Service Technician (FMST) School	All Hospital Corpsman
Infection Control in a Deployed Envirnoment (6A0F22)	Infection Control Officer, as a collateral duty, for one licensed medical provider (Physician, PA, APRN, RN) per each Role 2 plus, Role 3 MTF
Sexual Assualt Medical Forensic Examiner SAMFE	Sexual Assualt Medical Forensic Examiner (SAMFE) as a collateral duty. A minimum of one per each Role 2 plus and R3 MTF.

Interservice Physician Assistant Program (IPAP)	Must be Active Army, Reserve, National Guard (officer, warrant officer, enlisted) ROTC cadet, Air Force, Navy Marine Corp or Public Health Service, (Prior occupational specialty is not a determining factor in eligibility) Must be physically qualified for service retention and be within the height/weight guidelines of Army Regulations Must meet time in service requirements (3 years active federal service by 30 August of the year following application). Applicants not already classified as Army Medic or “68 series soldiers” must obtain release from their career management branch. Must be U.S. Citizens Must have a sound understanding and ability to speak and write in English. In lieu of having a BA degree applicant must have at minimum 60 hours of transferable credits from an accredited institution of higher learning, 30 of which must have been earned in-residence. Further any applicable anatomy, science, physiology courses must have been completed within the past five years or applicant will be subject to having to repeat these courses. These courses must have been completed with assigned letter grades to be considered acceptable for program purposes. Must meet GPA requirements Must have completed minimum credit hours in humanities, English, chemistry, anatomy, physiology, algebra (or higher math) and psychology
Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)	
NREMT-Paramedic Recertification Course	
Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)	Participants must possess a current State or National Registry of Emergency Medical Technicians - Paramedic certification.

National Registry Paramedic Bridge Course	Participants must possess a current NREMT-B certification.
Advanced Combat Trauma Training (ACTT)	
Advanced Combat Medic Course (ACMC)	
Prolonged Field Care Course (PFC)	
Applied Battlefield Medicine (ABM)	
Vehicle Extrication Course (VEC)	
Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	
Basic Combat Trauma Training (BCTT)	
Advanced Tactical Practitioner (ATP)	
Certified Flight Registered Nurse (CFRN) Review Course	Registered Nurse with current unrestricted license, 2 years of flight nurse experience is recommended

Critical Care Emergency Medical Transport Program (CCEMTP)	Paramedic, RN, RRT, MD, or DO
Advanced Hazmat Life Support (AHLS)	Physicians, Nurses, Paramedics, Pharmacists, Respiratory Therapists, Military Personnel, Toxicologists
Intro to Prolonged Field Care	Meant for 68W proficient in TCCC
#REF!	#REF!

Sustainment of Trauma and Resuscitation Program (STARS-P)	AFSCs from the C-STARS training matrix.
Expeditionary Medical Readiness Course (EMRC)	All Medical 3-level personnel
Expeditionary Medical Support (EMEDS)	
Aeromedical Evacuation and Patient Staging Course (AEPSC)	

Prerequisite Info		
Prerequisite Training	**Related/Follow-on Training**	**Requirement - Mandatory/To the greatest extent possible**
BLS, ACLS, ATLS,PALS (required for FFCCN), CCRN, TNCC, ATCN recommended, CRT eligble, CCATT Basic Course, CCATT Skill Validation Process IAW AFI 41-106, Clinical Validtion Committee approval (CVC)		
CCATT Basic Course, C-STARS CCATT Advanced Course		
Physicians (ACLS, ATLS highly encouraged), Nurses (ACLS, TNCC highly encouraged), Respiratory Technician (ACLS recommended)		
JST tactical/operational		
Medical professionals (physicians, oral surgeons, dentists, Physician Assistants, Nurses	ATLS-OE, PHTLS, TNCC	

Medical Professionals (Physicians and Physician Assistants)	C4	
Medical professionals (Dentists, Podiatrists, and Physician Assistants)	C4	
Military Nurse Corps Officers and U.S. government employed RNs (nurses)	C4	
Professional Medical (intended for general and orthopedic surgeons)		Trauma surgeons assigned to patient care delivery positions in a Role1, Role 2 light maneuver/FST, role 2 enhanced, and role 3 hospitals
Professional Licensure		
Assignment to a USSOCOM Naval or Marine Corp service component command	Special Operations Forces Sergeants Sustainment Program (SOFMSSP) 300-F21	

Physician, physician assistant, certified registered nurse anesthetist, critical care/emergency or operating room nurse, nurse practitioner, registered nurse, or senior medic assigned or profised to a Level III field unit. The course is available to providers from Active, Reserve and National Guard components of the Army, Air Force and Navy.		Physicians (surgical, non-surgical), PA, APRN, and nurses assigned to patient care delivery positions in role 1, role 2 light maneuver/FST, role 2 enhanced, and role 3 hospitals Required: this course, EMEDS, or equivalent
		Medics, corpmen, medical technicians and nurses involved in first responder care
Appropriate occupational license, completion of BLS/CPR	Recertification every 4 years	Job dependent
Appropriate clinical license, completion of BLS	Recertification every 4 years	Job dependent
Appropriate occupational license, completion of BLS/CPR	Recertification every 4 years	Job dependent
Completed Flight Medic Course, 66H8A, 66HM5, 66F, 60-62, or 65D. ACLS and EMT-B certification required, PALS/BTLS recommended.		

High school displorna or GED, current NREMT-B or higher certification, BLS certification		
Active duty Army, Air Force, Navy, National Guard, Army Reserve. Must be physician assistancs, physicians, dentists, nurses, or physical therapists in the grade of 01-06 pending utilization in their AOC at Level I/II while deployed. Non-commissioned applicants must be combat medics (68W30 or above) assigned as the Treatment NCOIC and accompanied by their unit physician or PA; Special Operations Medics 18D; or 68WW1. Priority given to soldiers within 90 days of deploying to combat zone.		Required for physicians, PA, ARPN, RN assigned to maneuver units or to Role 1 duties
Professional licensure	No recertification requirement	Not Mandatory
Pertinent professional license	Renewal required every 4 years	
All attendees must have completed the 300-68W(CMAST/MSTC) course or the Tactical Combat Casualty Care (TC3) course, within the previous 24 months.		

68W primary MOS, Skill level 20-40 and be NREMT current.		
Pertinent professional license	No recertification requirement	Not mandatory

Independent Study (IS) 100.b (ICS 100) – Introduction to Incident Command IS 200.b (ICS 200) – Single Resources and Initial Action Incidents* IS 700.a – National Incident Management System (NIMS), An Introduction* IS 800.b – National Response Framework (NRF), an Introduction* Defense Support of Civil Authorities (DSCA) Phase I		

	Sustainment every 3 years	Required for all DoD medical personnel and all non-medical personnel working in or assigned to an MTF (AFI41-106)

	Refresher course required every 4 years	Job dependent
ATLS, 4th or 5th year surgical resident, trauma fellow, board eligible or board certified surgeon	No recertification requirement	Job dependent
ATLS	No renewal required, however, ACS recommends retaking the course with each revised edition textbook publication	Job dependent
Professional licensure	No recertification requirement	Job dependent
BDLS, CDLS completion certificates	Refresher course every three years	Job dependent
Read through the resource manual, APLS: The Pediatric Emergency Medicine Resource, 5th edition	Refresher course every four years	Job dependent

BLS or CPR certification	Certification only active for 4 years, must re-take entire course when certification has expired to keep certification status	Job dependent
See eligible personnel	Refresher course every three years	Job dependent
Appropriate clinical license, completion of BLS	Certificate of completion is valid for 2 years	Job dependent
EMR, EMT license	Certificate of completion is valid for 2 years	Job dependent
	Refresher course every three years	Job dependent
Appropriate clinical license, completion of BLS	Certification is valid for 3 years, can take a shorter refresher course to renew	Job dependent

Appropriate clinical license, completion of BLS	Certification is valid for 3 years, can take a shorter refresher course to renew	Job dependent
Appropriate clinical license, completion of BLS	Certification is valid for 3 years, can take a shorter refresher course to renew	Job dependent
Appropriate clinical license, completion of BLS	Certification is valid for 3 years, can take a shorter refresher course to renew	Job dependent
	Certification is valid for 3 years, can take a shorter refresher course to renew	Job dependent
Appropriate clinical license, completion of infant/child BLS, be able to recognize various heart rhythms, be familiar with different types of airway management tools and their use, and have knowledge of the drugs commonly used to treat cardiovascular irregularities	Certification is valid for 2 years	Job dependent

Appropriate clinical license, completion of BLS	Refresher course required every four years to maintain certification	Job dependent
Current ALS certification	Certification is valid for 3 years. Once certification has expired, provider must take the full course over again.	Job dependent
Must be 18 years old	Certification is valid for 2 years. Once certification has expired, provider must take the full course over again.	Job dependent
Must be 18 years old	Certification is valid for 2 years. Once certification has expired, provider must take the full course over again.	Job dependent

Must be 23 years old	Certification is valid for 2 years. Once certification has expired, provider must take the full course over again.	Job dependent
Current ALS certification	Certification is valid for 4 years. Once certification has expired, provider must take the full course over again.	Job dependent
Current EMT certification	REMT, EMT, CPR - must recertify every 2 years, MCPIC every 5 years	Job dependent
None	Recertification every 2 years	Job dependent
Attendance of at least one other ALS course, be knowledgable of cardiac rhythm recognition and have adequate clinical experience in critical situations	Recertification every 2 years	Job dependent

	Special Operations Independent Duty Corpsman (SOIDC) 011-F68 Special Operations Forces Medical Sergeants Sustainment Program (SOFMSSP) 300-F21	
Assignment to a USSOCOM Naval or Marine Corps service component command.	Special Operations Independent Duty Corpsman (SOIDC) 001-F68 and Special Operations Forces Sergeants Sustainment Program (SOFMSSP) 300-F21	
Have graduated from course: 300-F8 (Special Operations Combat Medic) Have graduated from course: 011-F68 (Special Operations Independent Duty Corpsman)	Navy must attend this refresher once every 2 years	
Introduction to Special Operations Forces		

ADL module for NATO/Partner Joint Medical Planners		
1. Current NREMT Certification (EMT-B/I/P). 2. Current Basic Life Support Certification. 3. Current and qualified Class 3 Flying Duty Medical Examination. 4. ERB. 5. DA Form 705 within 90 days of attending the course. 6. Army EMS Credential Background Questionnaire	300-F2 Critical Care Paramedic Course	
1. Current NREMT certification (EMT-B/I/P). 2. Current Basic Life Support Certification. 3. Current and qualified Class 3 Flying Duty Medical Examination. 4. ERB 5. DA Form 705 within 90 days of attending the course. 6. Army EMS Credential Background Questionnaire. 7. *Once accepted, Soldiers will be provided and complete: EMS Training Application, UTHSCSA, Bluff Creek Tower Campus EMS Program		

1. DA Form 3838. 2. Copy of current NRP license. 3. Copy of current BLS certification. 4. Enlisted Record Brief (ERB). 5. Current DA Form 705, with passing score. 6. DA Form 4186 (Medical Recommendation for Flight Duty). 7. Proof of current class III flight physical. 8. ARMY EMS credential background questionnaire.	300-NREMT-P/NRP Recert Paramedic (ASI F2) Recertification	
	Operating Room Specialist Course Phase 2	
Operating Room Specialist Course Phase 1		
	Bushmaster Course; Prior deployed "combat care" experience with Fleet Hospital/Expeditionary Medical Facility (EMF/Duty with United States Marine Corps (USMC) or Army	Mandatory (OPNAVIST 6320.7A/MCO 6320.7A)

	Physicians: Pre-hospital Trauma Life Support (PHTLS) course; Nurses/PA: Prior deployed "combat care" experience with Fleet hospital/EMF/Duty with USMC or Army; Pas	Physicians: To the greatest extent possible (BUMEDINST 1500.15E), Nurses: Strongly recommended (BUMEDINST 1500.15E); PA: Strongly recommended-not required.
	None	Mandatory (BUMEDINST 1500.15E)
	None	Mandatory (BUMEDINST 1500.15E)

	1. Other Service Trauma Training Center completion (ie. ATTC or CSTARS), 2. Completed Trauma Fellowship within last 3 years (for Physicians) 3. Actively engages in ongoing care of trauma patients (moonlighting as defined by Parent Command) (Physicians/Nurses) 4. Theater Trauma Systems Clinical Practice Guidelines (CPGs) familiarization training within past 3 months (All); Corpsman: NOT WAIVERABLE if assigned to FRSS. For E-5 and above Theater Trauma Systems CPGs familiarization training within past 3 months.	Mandatory for FRSS/STP USMC Billets regardless of theater location - Marine Corps Combat Development Center (MCDC) ltr C134 of 13 Nov 2013; United States Central Command (USCENTCOM) Area of Responsibility (AOR): Mandatory one time experience if going to Role 2 Light Maneuver (LM) units; USCENTCOM FY15-16 Theater Training Requirements DTG241645Z March 15
	1. Joint Forces Combat Trauma Management Course (JFCTMC), 2. NTTC or other service trauma training program (ATTC/CSTARS), 3. Completed Trauma Fellowship within last 3 years, 4. Actively engaged in the ongoing practice of Trauma Surgery	Mandatory; USCENTCOM FY 15-16 Theater Training Requirements DTG 241645Z Mar 15

	Courses offered on Navy Knowledge Online (NKO):1. Traumatic Brain Injury 201: Overview for Health Care Personnel 2. Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0), 3. Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	Mandatory, BUMED Policy Memo 6000 SerM9/I11UN093000775 of 9 Sep 2011
	TBI for Deploying Providers: A 2- day, tri-service, "Train the Trainer" course sponsored by the Army and National Intrepid Center of Exellence (NiCoE)	Mandatory; USCENTCOM FRAGO 09-1734 Concussion /mTBI Management and Tracking; USCENTCOM FY15-16 Theater Training Requirements DTG 241645Z Mar 15

	1. Supervising Physicians throughout the Combined/Joint Opeartions Area-Afghanistan (CJOA-A) will ensure all physicians, Pas, NPs, nurses, medics and HMs are familiar with the current TCCC Guidelines of 7 May 2015. 2. Only regional medical advisors have the authority to exempt medical providers from the course 3. Every effort needs to be made to attend, however, f training cannot be completed , alternative courses are available: EWSC, JTCTMC, Expeditionary Medical Systems Training, training conducted at any Service specific trauma training center, or other equivalent course that meets minimum core requirements as determined through the Combat Trauma Surgery Committee of the DMRTI prior to deployment; Hospital Corpsman: NOT	Mandatory, BUMEDINST 1510.25; USCENTCOM FY15-16 Theater Training Requirements DTG 241645A Mar 15; USFOR-A 21117Z Mar 14 FRAGO 14-067
	1. NTTC 2. EWSC 3. Completed Orthopedic Trauma Fellowship in last 3 years. Actively engaged in the ongoing practice of Orthopedic Trauma Surgery 4. Theater Trauma Systems CPGs familiarization training within past 3 months; PA: None.	Stongly Recommended-Not Required

	1. Advanced Trauma Nurse Course, sponsored by the Society of Trauma Nurses; 2. Actively engaged in the ongoing practice of Emergency Trauma Resuscitation Nursing	Mandatory, All 1945, 1950, 1960, and 1972 Specialty Codes; BUMEDINST 1500.15E
	None	Mandatory, All 1945, 1950, 1960, and 1972 Specialty Codes, BUMEDINST 1500.15E.
ACLS	Not Waiverable if assigned to USMC ERC billets. Currently, only USMC billets associated with FRSSs/STPs have coded ERC billets; Corpsman: Not Waiverable if assigned to one of the 33HM USMC ERC billets. Currently only USMC billets associated with STPs/FRSSs have coded ERC billets. Must repeat JECC after 3 years unless actively engaged in the practice of crtical care transport nursing	Mandatory, For RNs assigned to USMC ERC Billets and the Critical Care Nurse for each of the nine FSTs; USMC ERC: MARADMIN; EnRoute Care Team Training Requirements; DTG 251454Z May 10 and COMNAVSURPACINST5450.6/COMNAVSURLANTINIST 5450.6 of Oct 2010; Corpsman: Mandatory for HMs assigned to one of the 33 HM USMC ERC billets., USMC ERC: MARADMIN; EnRoute Care Team Training Requirements; DTG 251454Z May 10
ACLS	Corpsman: Not Waiverable if assigned to one of the 33HM USMC ERC billets. Currently only USMC billets associated with STPs/FRSSs have coded ERC billets. Must repeat JECC after 3 years unless actively engaged in the practice of crtical care transport nursing	Corpsman: Mandatory for HMs assigned to one of the 33 HM USMC ERC billets., USMC ERC: MARADMIN; EnRoute Care Team Training Requirements; DTG 251454Z May 10

	None	Nurses: Strongly recommended-not required
	None	Stongly Recommended-Not Required
	Not Waiverable	Mandatory-for assignment with USMC. Strongly recommeded for all others.
	None	Mandatory-USCENTCOM Fy15-16 Theater Training Requirements DTG 241645A Mar 15
	None	Mandatory-DoDi 6495.02, USCENTCOM Fy15-16 Theater Training Requirements DTG 241645A Mar 15

	Certification valid for two years, then can be renewed after attending SOCM skills sustainment course and obtaining the required additional CME	
Professional licensure	Must recertify every four years by completing CEU's or retaking the certification exam	Not mandatory

Current licensure as paramedic, RN, RRT, MD or DO with 1 year experience and a working knowledge of pharmacodynamics, anatomy and physiology	Certification valid for 3 years; renewal by providing documentation of 48 CEU's at the ALS level with an emphasis in critical care, or renew by taking a renewal examination	Job dependent
Professional licensure	Four-year verification status after achieving at least 80% on the exam; reverification examination can be taken after four years, and following this second four year interval, the course must be retaken	Job dependent
#REF!	#REF!	#REF!

		Required in AFI41-106

Timing

Within 180 days of deployment

One time requirement
Within 180 days of deployment
Recertification every 4 years
Recertification every 4 years
Recertification every 4 years

Within 180 days of deployment
No recertification requirement
Renewal required every 4 years

No recertification requirement

For AFMS new accessions, required within 12 months of arriving at first duty station. Sustainment every 36 months.

Refresher course required every 4 years
No recertification requirement
No renewal required, however, ACS recommends retaking the course with each revised edition textbook publication
No recertification requirement
Refresher course every three years
Refresher course every four years

Certification only active for 4 years, must re-take entire course when certification has expired to keep certification status
Refresher course every three years
Certificate of completion is valid for 2 years
Certificate of completion is valid for 2 years
Refresher course every three years
Certification is valid for 3 years, can take a shorter refresher course to renew

Certification is valid for 3 years, can take a shorter refresher course to renew
Certification is valid for 3 years, can take a shorter refresher course to renew
Certification is valid for 3 years, can take a shorter refresher course to renew
Certification is valid for 3 years, can take a shorter refresher course to renew
Certification is valid for 2 years

Refresher course required every four years to maintain certification
Certification is valid for 3 years. Once certification has expired, provider must take the full course over again
Certification is valid for 2 years. Once certification has expired, provider must take the full course over again
Certification is valid for 2 years. Once certification has expired, provider must take the full course over again

Certification is valid for 2 years. Once certification has expired, provider must take the full course over again.
Certification is valid for 4 years. Once certification has expired, provider must take the full course over again.
REMT, EMT, CPR - must recertify every 2 years, MCPIC every 5 years
Recertification every 2 years
Recertification every 2 years

Once in a career, preferably within 2 years of accession

Physicians: Prior to assignment; Nurses/PA: Once in career preferably within 2 years of accession
Complete training preferably within 6 months of assignment. Nurses/PA: Maintain current through deployment.
Complete training preferably withing 6 months of assignemnt to OCONUS duty stations, operation assignments, or to HSAP platforms

Within 2 years prior to deployment
Physicians: Within 180 days prior to deployment; Nurses: Withing 180 days prior to deployment, one time requirement; PA: USCENTCOM AOR Within 180 days prior to deployment, one time requirement

Within 3 months of deployment
Within 3 months of deployment

Physicians/PA/Hospital Corpsman: Within 180 days of deployment; Nurses: Within 180 days prior to each individual augmentee (IA) or Health Services Augmentation program (HSAP) deployment
New Orthopedic Surgeons: within their 1st year; Current Orthopedic Surgeon: every 3 years; PA: Within 2 years prior to deployment

Maintain current through deployment
Maintain current through deployment
Within 3 years of deployment
Within 3 years of deployment

Within 2 years prior to deployment
Within 2 years prior to deployment
Once in career, preferably within 2years of accession
Within 12 months prior to deployment
Within 12 months prior to deployment

Must recertify every four years by completing CEU's or retaking the certification exam

Certification valid for 3 years; renewal by providing documentation of 48 CEU's at the ALS level with an emphasis in critical care, or renew by taking a renewal examination
Four-year verification status after achieving at least 80% on the exam; reverification examination can be taken after four years, and following this second four year interval, the course must be retaken
#REF!

Regular rotation through STARS-P locations throughout the year unless deployed, TDY, or on leave. Rotations part of normal duty.
Complete within 12 months of assignment. Repeat: FFEPS and FFPPS every 24 months Other ERPSS every 48 months Fixed ERPS - one time within 12 months

Course Name	**Link**
Critical Care Air Transport Team Advanced Course (CCATT)	http://ccatt.info/index.php/ccatt/ccat-advanced-course
Tactical Critical Care Evacuation Team Course (TCCET)	http://amops.org/wp-content/uploads/2015/04/CCATT-by-Patricio-Bruno-DO.pdf
CCATT Course	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.51/afttp3-42.51.pdf
CCATT Course	
Critical Care Air Tranport Team (CCATT) Initial Course	http://ccatt.info/index.php/main-menu-resources/ccatt-initial/file/198-ccatt-initial-course-information-package

Army Trauma Training Course (ATTC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6H-F31%2F300-F18&crstitle=ARMY+TRAUMA+TRAINING+COURSE&phase= http://ccn.aacnjournals.org/content/35/2/e11.full?sid=14a41642-af9b-4e37-898b-bf8e213046c7
Combat Casualty Care Course (C4)	http://www.dmrti.army.mil/courses.html

Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	http://www.dmrti.army.mil/courses.html
Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	http://www.dmrti.army.mil/courses.html
Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	http://www.dmrti.army.mil/courses.html
Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	http://www.dmrti.army.mil/courses.html

Advanced Trauma Training Program (ATTP)	http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_university&ParentId=1320160660184&ParentType=RushUnivLevel4Page&cid=1297690892714&level1-ppp=1320160660114&level3_parent_page=1320160660114&pagename=Rush%2Fcontent_block%2FContentBlockDetail
CCAT Foundational Level	http://www.ccat-training.org.uk/
Special Operations Independent Duty Course	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsIndependentDutyCourse.aspx
Expeditionary Medical Unit Training	http://www.med.navy.mil/sites/nmotc/nemti/Pages/CourseCatalog.aspx
Navy Trauma Training Course (NTTC)	http://www.med.navy.mil/sites/nmotc/nemti/nttc/Pages/default.aspx

Tactical Combat Casualty Care Provider	
Joint Forces Combat Trauma Management Course (JFCTMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6A-F19%2F300-F37&crstitle=JOINT+FORCES+COMBAT+TRAUMA+MANAGEMENT+COURSE&phase=
Tactical Combat Casualty Care - All Combatants (TC3-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac

Tactical Combat Casualty Care - Medical Providers (TC3-MP)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum
Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac
TC3-MP	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum

Tactical Emergency Casualty Care (TECC)	http://www.naemt.org/education/tecc
Joint Enroute Care Course (JECC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=c13159f5-f397-4504-ae33-d5c542c8759d
Flight Medic Course (FMC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=73b51009-38ce-4f01-9700-3a8d7d1589fe

JRTC - Combat Training Center (CTC) Program	http://www.globalsecurity.org/military/ops/ctc-jrtc.htm http://www.globalsecurity.org/military/ops/ctc-jrtc-scenario.htm Full description: http://www.apd.army.mil/pdffiles/r350_50.pdf
Tactical Combat Medical Care (TCMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2011&sch=081&crs=6H-F35%2F300-F38&crstitle=TACTICAL+COMBAT+MEDICAL+CARE+(TCMC)&phase= http://www.first.army.mil/diveast/(X(1)S(4qf0inntvvshrk55bv4idcac))/documents/pdf/Coursedescription09.pdf

Advanced Trauma Care for Nurses (ATCN) with ATLS	http://www.ucdmc.ucdavis.edu/cppn/classes/atcn.html http://www.traumanurses.org/atcn http://www.atls.in/atcn/courses-details.htm
Advanced Burn Life Support (ABLS)	http://www.ameriburn.org/ablscoursedescriptions.php http://www.ameriburn.org/ABLSProviderObjectivesSummary.pdf
Brigade Combat Team Trauma Training (BCT3)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-68W(BCT3)&crstitle=BRIGADE+COMBAT+TEAM+TRAUMA+TRAINING&phase=

Military Transition Team Medical Course (MiTT)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-F40&crstitle=MILITARY+TRANSITION+TEAM+MEDIC+PRE-DEPLOYMENT&phase=
Advanced Surgical Skills for Exposure in Trauma (ASSET)	https://www.facs.org/quality%20programs/trauma/education/asset
Combat Extremity Surgery Course (CESC)	https://sites.google.com/site/combatextremitysurgerycourse/

Pediatric Fundamentals of Critical Care Support (PFCCS)	http://www.sccm.org/Fundamentals/PFCCS/Pages/default.aspx
Joint Medical Operations Course (JMOC)	http://www.dmrti.army.mil/courses.html

Military Medical Humanitarian Assistance Course (MMHAC)	http://www.cdham.org/mmhac
Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	http://www.dmrti.army.mil/documents/1_EPRC%20Course%20Descriptions.pdf

Public Health Emergency Management (PHEM)	http://www.dmrti.army.mil/courses.html
Shipboard Surgical Trauma Training (S2T2)	
*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	https://www.wright.edu/national-center-for-medical-readiness
Advanced Trauma Life Support (ATLS)	https://www.facs.org/quality-programs/trauma/atls

Advanced Trauma Operative Management (ATOM)	https://www.facs.org/quality-programs/trauma/education/atom
Rural Trauma Team Development Course (RTTDC)	https://www.facs.org/quality-programs/trauma/education/rttdc

Disaster Management and Emergency Preparedness (DMEP)	https://www.facs.org/quality-programs/trauma/education/dmep
Advanced Disaster Life Support (ADLS)	http://www.ndlsf.org/index.php/courses/adls

Advanced Pediatric Life Support (APLS)	www.aplsonline.com
Advanced Wilderness Life Support (AWLS)	http://awls.org

Basic Disaster Life Support (BDLS)	http://www.ndlsf.org/index.php/courses/bdls
Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx

Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx
Core Disaster Life Support (CDLS)	http://www.ndlsf.org/index.php/courses/cdls
International Trauma Life Support Basic (ITLS Basic)	https://www.itrauma.org/education/itls-provider/

International Trauma Life Support Advanced (ITLS Advanced)	https://www.itrauma.org/education/itls-provider/
International Trauma Life Support Pediatric (ITLS Pediatric)	https://www.itrauma.org/education/itls-pediatric/
International Trauma Life Support Access (ITLS Access)	https://www.itrauma.org/education/itls-access/

International Trauma Life Support Military (ITLS Military)	https://www.itrauma.org/education/itls-military/
Pediatric Advanced Life Support (PALS)	http://cpr.heart.org/AHAECC/CPRAndECC/Training/HealthcareProfessional/Pediatric/UCM_476258_PALS.jsp
Prehospital Trauma Life Support - Provider (PHTLS)	https://www.naemt.org/education/PHTLS/whatisPHTLS.aspx

Wilderness Advanced Life Support (WALS)	https://www.wildmed.com/wilderness-medical-courses/medical-professionals/wilderness-advanced-life-support/
Wilderness Medicine for the Professional Practitioner (WMPP)	http://www.nols.edu/wmi/courses/wildmedpandp.shtml
Wilderness Upgrade for Medical Professionals (WUMP)	http://www.nols.edu/wmi/courses/wildupgrademedpros.shtml

Wilderness Medical Expedition (WME)	http://www.nols.edu/wmi/courses/wilderness_medicine_expeditions.shtml
Remote Medicine for the Advanced Provider (RMAP)	https://www.remotemedical.com/training/remote-medicine-for-the-advanced-provider-rmap/

Remote Medicine Upgrade and Certification (RMUR)	https://www.remotemedical.com/training/remote-medicine-upgrade-and-recertification-for-emt-rmur/
Tactical Medicine Awareness Training (TMAT)	https://www.remotemedical.com/training/tactical-medicine-awareness-training/
Comprehensive Advanced Life Support (CALS)	https://calsprogram.org/courses/full-day-provider-course/

Special Operations Combat Medic Course (SOCM)	http://learn.jsomtc.org/ https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2014&sch=331&crs=300-ASIW1&phase=&clsFlag=

Special Operations Combat Medic Course (SOCM)	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicCourse.aspx
Special Operations Combat Medical Skills Sustainment Course	Server documents (JSOMTC folder) http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicSkillsSustainmentCourse.aspx https://www.atrrs.army.mil/atrrscc/prerequisites.aspx?fy=2005&sch=331&crs=011-F68&phase=&cls=003&clsflag=&startDate=2005-04-14&endDate=2005-09-22

Special Forces Medical Sergeant (SFMS, 18D)	http://learn.jsomtc.org/ SOCM prereq document http://www.professionalsoldiers.com/forums/showthread.php?t=1483
Special Operations Civil Affairs Medical Sergeant Course	http://learn.jsomtc.org/
Special Forces Medical Sergeant Refresher Course	

Joint Special Operations Medical Orientation Course (JSOMOC)	https://jsou.socom.mil/Pages/CourseInformation.aspx?CourseName=Joint%20Special%20Operations%20Medical%20Orientation%20Course Some info from previous JSOMOOC course
Joint Medical Planner Course (JMPC)	http://www.natoschool.nato.int/Academics/Resident-Courses/Course-Catalogue/Course-description?ID=85
HOSPEX Training - Validation Events	

300-F1 Flight Paramedic	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.
300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.
Paramedic (ASI F2) Recertification Course	300-NREMT-P/NRP RECERT POC at COMM: 502-613-5233.

Operating Room Specialist Course Phase 1	301-68D10 Operating Room Specialist Phase 1
Operating Room Specialist Course Phase 2	301-68D10 Operating Room Specialist Phase 2
Critical Care Nursing Course	6F-F5 Critical Care Nursing
Emergency Nursing Course	6F-F6 Emergency Nursing

Management of Burns and Multiple Trauma Course	Special Information: 3698 Chambers Pass, FSH, TX 78234-6315. Send DA 3838 to: DHET, 2421 Hood St., Ste. B., FSH, TX 78234-6315 COMM: 210-295-9428 or DSN: 471-9428.
Oral and Maxillofacial Surgery Course	6H-A0204 Oral and Maxollofacial Surgery Special Information: Course location: Primary: Fort Sam Houston, TX. How to enroll: Send DA 3838 to Graduate Dental Education, 2421 Hood St., Ste. B, FSH, TX 78234 COMM: 210 221-0079 or DSN: 471-0079 FAX: 471-2832.
Aeromedical Evacuation (AE)	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.5/afttp3-42.5.pdf
Emergency Nursing Pediatric Course (ENPC)	https://www.ena.org/education/ENPC-TNCC/enpc/Pages/aboutcourse.aspx

Combat Casualty Care Course (C4)	
C4	
ATLS and ACLS	
ATLS and ACLS	
Navy Trauma Training Course (NTTC)	
Bushmaster Course	
Emergency War Surgery Course (EWSC)	
Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting	
Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course	
TBI for Deploying Providers	
Traumatic Brain Injury 201: Overview for Health Care Personnel	
Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)	

Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	
Tactical Combat Casualty Care (TC3)	
Combat Extremity Surgery Course (CESC)	
Trauma Nurse Core Course (TNCC)	
ACLS	
Joint Enroute Care Course (JECC)	
Flight Medic Course (FMC)	
Emergency Nursing Pediatrics Course	
Advanced Burn Life Support (ABLS)	
Field Medical Service Technician (FMST) School	
Infection Control in a Deployed Envirnoment (6A0F22)	https:www.atrrs.army.mil/atrscc/course.aspx.
Sexual Assualt Medical Forensic Examiner SAMFE	

Interservice Physician Assistant Program (IPAP)	http://www.cs.amedd.army.mil/ipap/
Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)	https://www.t1g.com/project/medical-certification-courses/
NREMT-Paramedic Recertification Course	https://www.t1g.com/project/medical-certification-courses/
Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)	https://www.t1g.com/project/medical-certification-courses/

National Registry Paramedic Bridge Course	https://www.t1g.com/project/medical-certification-courses/
Advanced Combat Trauma Training (ACTT)	https://www.t1g.com/project/provider-level-courses/
Advanced Combat Medic Course (ACMC)	https://www.t1g.com/project/provider-level-courses/
Prolonged Field Care Course (PFC)	https://www.t1g.com/project/provider-level-courses/
Applied Battlefield Medicine (ABM)	https://www.t1g.com/project/medic-specialty-courses/
Vehicle Extrication Course (VEC)	https://www.t1g.com/project/medic-specialty-courses/
Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	https://www.t1g.com/project/medic-specialty-courses/
Basic Combat Trauma Training (BCTT)	https://www.t1g.com/project/operator-level-courses/

Advanced Tactical Practitioner (ATP)	atp@socom.mil
Certified Flight Registered Nurse (CFRN) Review Course	http://www.bcencertifications.org/Get-Certified/CFRN.aspx

Critical Care Emergency Medical Transport Program (CCEMTP)	http://ehspace.umbc.edu OR http://www.augusta.edu/mcg/em/com/ccempt.php OR http://www.centerem.org/courseseducation/ccemtp
Advanced Hazmat Life Support (AHLS)	https://www.ahls.org/ahls/ecs/courses/courses.html

Intro to Prolonged Field Care	https://prolongedfieldcare.org/2016/07/09/prolonged-field-care-classes-for-68ws/ https://drive.google.com/folderview?id=0B7OAVQuGtbzAdVRhMDdKdzBsQWc&usp=sharing
#REF!	#REF!
Sustainment of Trauma and Resuscitation Program (STARS-P)	AFI41-106 document
Expeditionary Medical Readiness Course (EMRC)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf
Expeditionary Medical Support (EMEDS)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.7/afttp3-42.7.pdf

Aeromedical Evacuation and Patient Staging Course (AEPSC)	AFI 41-106 document http://static.e-publishing.af.mil/production/1/af_sg/publication/afi44-165/afi44-165.pdf

Course Content
Enroute Combat Casualty Care, Rotary Wing Transport (CASEVAC), End Points of Resuscitation/Shock, Initial Properties in the Trauma Patient, Blood and Blood Component Administration, Thoracic Trauma, Abdominal Trauma, Head Trauma/Spine and Spinal Cord Injury, ARDC/Ventilator Lab, ACLS Updates, Sedation/Analgesia/Paralytics, Aeromedical Evacuation System, Aricraft Overview, Stresses of Flight, Infection Control, CRM, Aeromedical Evacuation Documentation, Flight Line Safety/Life Support, Thermal Injury/Burns, Extremity Trauma/Pelvic Fractures/External Fixation, Trauma in Special Populations, Acute Coronary Syndrome
Initial Priorities in the TCCET Patient, Tactical Critical Care Course, Difficult Airway Management, Documentation, Canine Care, Patient Movement Equipment Items, TCCET Rodeo, Planning/Static Execution Adult Simulator, TCCET Mission Planning/Patient Preparation Field Exercise, Mission Planning/Patient Preparation/Tricks of the Trade, Patient Preparation/Flight
Doctrine(CCAT and Aeromedical, Concepts, EMEDS, AE Primer), Altitude Physiology (Stresses of Flight, Chamber Rides), Clinical (Patient Flight Physiology, Acute Respiratory Failure, Mechanical Ventilation, Hemodynamic Monitoring, Burn Management, Clinical Issues), Operational (Allowance Standars/CCAT Team Bags, Transport Pharmacology, CRM, Eqpmt Approval, Flight Line Safety, Aircraft Familiarization, O2 Theramy/Systms, Hands-on Equipment Training, Litter Loading, Infection Control, Mission Managment and Documentation, Field Contigency Exercises)

Tourniquets/wound packing, junctional tourniquets, hypothermia prevention, patient transportation, pain management, JTS CPGs, infection control, damage control resuscitation, fresh whole blood, frozen blood, acoustic trauma, ocular trauma, UXO management, military working dog management, management of severe head injury, catastrophic care, TCCC cards, JTTS forms, radiology, REBOA, prevention of VAP, TeamSTEPPS, trauma teamwork system, trauma triage, medical decision making under stress, trauma/disaster orthopedic concepts (splint, traction splints, pelvic binders), airway management, chest trauma (surgical airway, needle decompression, chest seals, chest tubes), physiologic access, advanced thermal infusers/IV pumps, advanced anesthesia concepts, burr hole/craniotomy, lateral canthotomy, infection control, ET intubation, tib/hum/sternal IO
C4 prepares tri-service medical officers with the knowledge critical in conducting Role I & II healthcare operations in an austere, combat environment. C4 provides training in leadership skills, field medical knowledge and the practical information needed for direct medical support of tactical units under combat conditions. Progressing through the phases of TCCC from care under fire, tactical field and tactical evacuation care, through the echelons of care from point-of-injury to Role II scenarioes. Lanes are simulating mission-oriented medical scenarioes of Village Stability Operations (VSO), Mass Casualty (MASCAL) events, Military Operations on Urban Terrain (MOUT), Tactical Medical Lane (obstacle course), Tactical Evacuation Lane, and a simulated Role II facility utilizing simulator technology. Students encounter combat scenarios in varying roles of leadership and team organization, and participate in the planning, rehearsals, and execution of the medical mission.

Clinical Practice Guidelines,JTTS, Mass Casualty/Triage, War Wounds, Enroute Care, Pediatric Trauma, Spinal Injury Management, Combat Extremity Fracture Management, Vascular Injuries, Pelvic Injuries, Amputations, DCR, Abdominal Injuries, Thoracic Injuries, Head Injuries/Trauma, Shock and Resuscitation, Face and Neck Injuries, Ocular Injuries, Field Critical Care, Soft Tissue Debridement, Human Cadaver Lab, Animal Salvage Lab

Military advanced trauma training, PTSD andTBI awareness/identification/treatment, New provider and renewal certification options for BLS, ACLS, PALS, ABLS, ATLS, ITLS, ADLS, BDLS, TNCC, CCEMTP, AHLS, Cadaver lab, live tissue lab, skills admistration and testing, combat trauma lane, ambulance ride along and level 1 trauma experience
The objective of the course is to give a thorough foundation in the art and science of Retrieval and Transport Medicine. Taught by experts in aviation physiology aerospace medicine, retrieval medicine, intensive care, emergency medicine and pre-hospital care. Addressing relevant issues of the special physical, physiological and psychological stresses that are important in various transport environments, and describes the conditions which are susceptible during transfers by land and air.
The student receives training in veterinary, dental, laboratory, medical diseases and case studies, nursing, initial and long-term wound care, Unconventional Warfare hospital, surgical procedures, pre-anesthesia, anesthesia, post anesthesia care, nursing care, records and reports, radiology, and central materials supply.

The course includes didactic instruction in casualty care at level III facilities, triage, primary and secondary survey of combat causalities, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat wound management, antibiotics and pain control in the combat environment, and combat fluid maintenance. Practical exercises for providers are conducted in airway management, surgical treatment of extremity trauma, chest, abdominal, head, neck and thermal wounds, and pain management/anesthesia delivery mechanisms. Practical exercises for nurses are conducted in airway management, ventilator management, chest tube management, intra-cranial pressure monitoring, central line management, methods of hemorrhage control, nursing management of compartment syndrome, and preparation of casualties for aeromedical evacuation

Contains the foundation of all trauma training programs focused on treating the casualty, preventing further injuries and completing the mission.
Airway, drags and carries, hemostatic dressings (Celox gauze, chito gauze, combat gauze), limb tourniquets, peripheral pulses
Combat Application Tourniquet, nasopharyngeal airway, cric-key, needle decompression, ruggedized field IV, intraosseous infusion (FAST1). Supplementary modules: celox gauze, chito gauze, combat gauze, CRoC, JETT, SJT (SAM junctional TQ), SOFTT.

The course covers topics designed to decrease preventable death in the tactical situation, including: hemorrhage control, surgical airway control and needle decompression, strategies for treating wounded responders in threatening environments, caring for pediatric patients, and techniques for dragging and carrying victims to safety
Aeromedical rotor wing doctrine, transport equipment and packaging, advanced trauma and critical care management, combined skill aeromedical scenarios, UH60 and CH47 familiarization.
The FMC course provides selected medical enlisted personnel with the knowledge and skills required to conduct pre-Medical Evacuation (MEDEVAC) treatment, load/unload patients in MEDEVAC aircraft and stabilize/treat patients in flight. Soldiers will also have the capability to identify and utilize various MEDEVAC aircraft systems and Medical Equipment Sets, high performance hoist operations and in-flight crew duties as a non-rated crewmember, and perform aircraft radio communication.

Course Goals: The evaluation, resuscitation and management of the wounded soldier present a unique challenge to the medical provider. The modern battlefield and advancements in technology have changed our way of thinking in the approach to combat casualty management. Through “lessons learned” we have found that traditional ATLS/BTLS formats are not applicable to the combat casualty. This course will provide information on how to apply known concepts in trauma to the combat casualty in the combat environment. This course will emphasize the following concepts:

1. Initial Assessment of the combat casualty
2. Initial resuscitation and stabilization
3. Management of specific combat injuries
4. Emergency surgical procedures
5. Post resuscitation management

Students will train on the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of injury, triage, primary and secondary survey of combat casualties, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat extremity trauma, antibiotics and pain control in the combat environment, splinting and dressing workshop, and combat fluid

Didactic presentations on initial assessment, airway management, abdominal trauma, thoracic trauma, shock, head and spinal cord trauma, pediatric trauma, trauma in pregnancy, and stabilization and transportation.
Course objectives: Evaluate a patient with a serious burn Define the magnitude and severity of the injury Identify and establish priorities of treatment Manage the airway and support ventilation Initiate and monitor fluid resuscitation Apply correct methods of physiological monitoring Determine which patients should be transferred to a burn center Organize and conduct the inter-hospital transfer of a seriously injured burn patient.
Provides an opportunity for soldiers selected as Brigade Combat Team (BCT) units and the Flight Medic of Army MedEvac crews to acquire the technical and tactical skills needed to function as squad size trauma teams: A. Prepare unit and subordinate elements for peace and wartime missions and contingencies. B. Plan and execute tasks and missions assigned to squad size elements. The Brigade Combat Trauma Team Training (BCT3) course incorporates Tactical Combat Casualty Care (TC-3), emergency medical treatment and evacuation in a variety of operational combat settings from point of injury through to echelon III of the military health care system. The course is based upon the injury patterns of combat casualties and the constraints to deliver medical care on the battlefield and in urban warfare.

We will introduce, emphasize, and reinforce Tactical Combat Casualty Care principles, patient assessment and treatment, and the importance of adaptability, improvisation, innovation, self-reliance, and self- sufficiency. The NCO will be introduced to the role of medical advisor to US and Coalition Leadership on all health care matters.
Surgical exposures in neck, chest, abdomen/pelvis, and upper/lower extremities
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone

Prioritize assessment needs for the criticaly ill or injured infant and child Select appropriate diagnostic tests Identify and respond to significant changes in the unstable pediatric patient Recognize and initiate management of acute life-threatening conditions Determine the need for expert consultation and/or patient transfer and prepare for optimal transfer
1. Examine the planning factors and elements related to joint, coalition, and USG interagency medical planning, and DoD support to civil authorities. 2. Support the joint medical planning community in the development of the systems analysis, operational risk assessment, and field medical services planning. 3. Discuss HSS operations in the Joint Operations Area. 4. Categorize DoD and USG interagency deployable Health Service Support (HSS) capabilities. 5. Summarize the military medical continuum of care to include the patient movement system. 6. Identify resources and processes that are available to Medical Planners and Action Officers. 7. Demonstrate Joint Operational and Health Service Support Planning.

This course was developed by a multidisciplinary faculty assembled from individuals with experience in humanitarian operations and expertise in infectious disease, management of dehydration, malnutrition, preventive medicine and health education. The instructional strategy relies heavily on interactive processes (scenario exercises and case management based skill stations). The scenarios and cases are all derived from real operational experiences of instructors and allow students to problem solve and face ethical dilemmas in triage and develop creative logistical and clinical solutions. In class instruction parallels this manual which contains complete diagnostic and treatment algorithms for the targeted clinical conditions and has been derived from publications of international public health authorities. The course culminates in a round robin of “skill stations” in which students must demonstrate their ability to manage a field clinical scenario in each major category: Dehydration, Malnutrition, and Infections. In addition students must complete a comprehensive written exam.
Basic: This course provides an overview of the different types of Chemical, Biological, Radiological, Nuclear, or high-yield explosives (CBRN) threats, information on how to prepare for and recognize a CBRNE threat, and instructions on the protective measures. It also explains disaster management and the actions it take to prepare for, respond to and recover from an all-hazards incident. Short: Refresher/Sustainment course is designed to prepare personnel to effectively respond to an all-hazards incident including those emanating from chemical, biological, radiological, nuclear, or high-yield explosives (CBRNE) sources. This course also explains the current global threat of CBRNE use, the characteristics and effects of threat agents, principles of personal protection, agent detection, recognition and emergency treatment of agent exposure, and the principles of triage and decontamination of CBRNE agent casualties. Executive: This is provides an overview of the National Incident Command System, National Response Framework, and the response from at the local, State, and National levels during an all-hazards incident. It describes how DSCA fits into the missions of homeland security (HLS) and homeland Defense (HLD) and describes how DoD supports HLS and HLD missions to provide civil support.

NCMR develps and delivers custom exercises for any organization in order to meet their unique requirements. The exercises conform to Homeland Security Exercise & Evaluation Program standards, and the NCMR team assists with exercise program management, design and development, conduct, evalation and improvement planning. They also offer discussion-based exercises (seminars, workshops, tabletop exercises and games) which focus on strategic, policy-oriented issues.
Systematic, concise approach to the care of a trauma patient; the course teaches a safe, reliable method for immediate management of injured patients including assessment techniques, resuscitation, stabilization and severity prioritization for possible facility transfer, while ensuring the provision of optimal care

Teaches proper operative technique for dealing with trauma injury, increasing self-efficacy in management of traumatic injuries, increasing knowledge in management of penetrating injuries, gaining the ability to successfully and safely perform all operative procedures presented in the course
The course is based on the concept that in most situations, rural facilities can form a trauma team consisting of at least three core members; the purpose of the course is to provide leadership and advocacy for rural trauma/surgical issues and the rural trauma patient. The objectives of the course include defining roles and responsibilities for team members, facility preparation, identification of local resources and limitations, patient assessment and resuscitation, early initiation of the transfer process, establishment of a performance improvement process, effective communication skills, and defining the relationship between the rural trauma facility and regional trauma system.

Epidemiology and history of disasters, disaster planning, disaster response organization and execution, medical management of mass casualties, pathophysiology and patterns of injury, postdisaster assessment and recovery, pitfalls and barriers in disaster planning and response, understanding the needs of special populations (pediatric, geriatric, disabled).
Course objectives include:explaining the shift from individual to population-based care in a disaster or public health emergency, practice mass casualty triage in a simulated disaster scenario, choose strategies to establish organizational and community surge capacity in a disaster or public health emergency, differentiate roles performed in an emergency operations center or incident command center established in response to a simulated mass casualty event, discuss legal, regulatory, and ethical principles and practices to enable health professionals to provide crisis standards of care in a disaster or pubic health emergency, select personal protective equipment and decontamination measures appropriate for personnel and public health protection in a disaster or public health emergency, and apply clinical skills for the management of mass casualties in simulated all-hazards scenarios

The course content consists of core topics with additional topics that can be added per the instructor's decision. The main topics include pediatric assessment, pediatric airway in health and disease, shock, cardiovascular and central nervous systems, trauma, child maltreatment, nontraumatic surgical and orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia and children with special health care needs. The course has an optional PALS informational offering. Many of the topics covered are among the requirements for residency education in pediatrics, including: acute episodia medical illnesses (meningitis, sepsis, dehydration, pneumonia, diarrhea, renal failure, seizure, coma, hypotension, hypertension, respiratory illness), problems associated with chronic disease (diabetic ketoacidosis, status asthmaticus, status epilepticus, congenital heart disease, cystic fibrosis, gastrointestinal, metabolic and neurologic disorders). The manual outlines step-by-step over 90 procedures - these can be presented as skill stations by the instructor and include endotracheal intubation, placement of I/O and IV lines, umbilical artery and vein catheter placement, thoracic procedures, surgical airway techniques, wound care, suturing, splinting and casting
The course objectives including providing a practical foundation in Wilderness Medicine for medical professionals, teaching patient assessment and treatment guidelines for life support until defnitive care or evacuation is available, training providers the methods for managing medical and traumatic emergencies and urgencies in the wilderness when evacuation is unavailable or unnecessary, and teaching techniques and guidelines for evacuation

Course participants will be able to describe the following upon completion of the course: an all-hazard, standardized, scalable casualty management approach for use in disasters and public health emergencies, including life-saving interventions and medical decision making in an altered care environment; information sharing, resource access, communication, and reporting methods useful for health professionals during disasters and public health emergencies; the purpose and importance of the incident management system for providing health and medical support services in a disaster or public health emergency; field, facility, community and regional surge capacity assets for the management and support of mass casualties in a disaster or public health emergency; considerations and solutions to ensure continuity of and access to health-related information and services to meet the medical and mental health needs of all ages, populations, and committees affected by a disaster or public health emergency; public health interventions appropriate for all ages, populations and communities affected by a disaster or public health emergency; identification of potential casualty populations in a disaster or public health emergency, including persons with acute injuries or illnesses, those with pre-existing disease, injuries or disabilities, and those with age-related vulnerabilities and other functional and access needs, including their family/caregiver support network; deployment readiness components for health professionals in a disaster or public health emergency; all-hazards standardized, scalable workforce protection approach for use in disasters and public health emergencies, including detection, safety, security,
Course focuses on pediatric assessment, airway skills, spinal stabilization, vascular access, children with special healthcare needs, respiratory emergencies, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions

Course focuses on pediatric assessment, airway skills, spinal stabilization, children with special healthcare needs, respiratory, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions
Course objectives focus on the following topics: all-hazards approach to disaster mitigation, preparedness, response and recovery; essential components of federal, state, regional, and community disaster health systems, including the role of public and private health sectors; elements of the PRE-DISASTER paradigm and their application to the management of disasters and public health emergencies; actions that can be taken to enhance personal preparedness and resilience for disasters and public health emergencies; legal and ethical issues that impact disaster mitigation, preparedness, response, and recovery, including the basic legal framework for public health; the elements of the DISASTER paradigm and their application for the management of disasters and public health emergencies
The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma

The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma
The didactic portion of the course includes: assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices
The didactic portion of the course includes: the tools to do the job, size-up, call for help and set-up, vehicle stabilization, accessing, stabilizing the victim, disentanglement, packaging and transfer. The course uses actual wrecked cares for skill practice, as the majority of the content is focused on practical skills.

The didactic portion of the course includes: scene size-up, assessment and initial management of the trauma patient, airway management, shock evaluation and management, thoracoabdominal trauma, head, spinal and extremity trauma, blast injury, burns, special populations (pregnant, pediatric, geriatric), special situations (intoxication and trauma arrest)
The course content includes: 1-rescuer child CPR and AED use, 1- and 2-rescuer infant CPR, management of respiratory emergencies, rhythm disturbances and electrical therapy, vascular access, resuscitation team concept, cardiac, respiratory and shock case discussions and simulations, systematic approach to pediatric assessment
The course provides a safe environment to practice trauma assessment and treatment skills while teaching valuable critical thinking skills that positively influence decision making. Topics covered include scene assessment, primary patient assessment, airway-breathing-circulation-disability, secondary survey/reassessment, team approach, communication skills, potential pitfalls, airway anatomy, procedures, adjuncts and injuries for adult and pediatric patients, breathing, ventilation and oxygenation support and treatment, circulation, hemorrhage control and shock (including anatomy, metabolism, pathophysiology, mechanisms and assessment of shock when there is no clear cause), CNS trauma, brain and spinal cord injuries and management, special considerations and unique aspects of pediatric, geriatric and multiple patients

The course focuses on procedures and technologies that are most appropriate for extreme environments and extended-care context, providing well-rounded exposure to the challenge of providing advanced medical care in a difficult environment. A large portion of the course is devoted to hands-on training and general principles of wilderness and rescue medicine, and a significant amount of time is spent outdoors. Pre-course study guides are mailed 2-4 weeks before the course, and participants take an on-line pretest and complete case study assignments prior to the beginning of the course. Skill labs include basic and advanced airway techniques and equipment, cardiovascular emergencies and wound management. Moulage and simulation scenarios are utilized during hands-on instruction.
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure
The course is focuses on professional medical practitioners and teaches them to build on a background in urban emergency care and learn how to improvise equipment, deal with challenging environmental conditions and make difficult medical decisions in remote locations

The course is influenced by weather, terrain and the characteristics of the individuals involved, and are thus not fully scripted. Given the variables, the depth of topic coverage may vary.
Course educates participants on immobilization and carrying techniques, litter packaging cold and heat emergencies, joint reductions, fracture management, spinal injury assessment and management, eye injuries, dental emergencies, expedition health and hygiene, psychological emergencies, tropical medicine, altitude illness, envenomation, evacuations, rescue considerations, mass casualty incidents, triage situations, how to utilize medical kits and manage remote site clinics

This course refreshes all REMT curriculum, including high-level medical skills and topics that include advanced wound closure (suturing), Foley catheterization, antibiotic therapy, IV administration, sick call and primary care, pediatrics, geriatrics, and childbirth. Additionally, the course covers travel medicine, telemedicine, medical kit integration, lifting and moving patients, advanced airway management, oxygen administration, shock, thoracic trauma, head injuries, dental emergencies, musculoskeletal injuries, respiratory and cardiac emergencies, mass-casualty incidents, anaphylaxis, cold and heat emergencies, altitude, immersion, and submersion among others.
The course reviews the difference between high-risk and convential medicine, the top causes of preventable death in high-risk scenarios, how to properly identify and treat life threatening injuries, high-threat extraction techniques, and what to do during mass casualty incidents. The course also covers wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries
This two-day provider course provides CALS core curriculum and serves as the foundation for all of its learning opportunities, presented on-site in rural or remote hospitals, offering interactive sessions in cardiac, traumatic, pediatric, obstetrical, neonatal and medical advanced life support; team attendance is encouraged; the course expects demonstration of the ability to problem solve in a variety of clinical situations, identification of key threats and demonstration of therapeutic interventions, discussion of the roles of each team member involved in patient evaluation and treatment, and performance of skills consistent with the provider's role on the advanced life support team

The SOCM student will be proficient in the following areas/objectives upon completing the course. Basic Life Support (BLS) -certifies students through the American Heart Association (AHA) approved curriculum; Emergency Medical Technician -prepares students to sit for the National Registry for Emergency Medical Technician (NREMT) exam and culminates with NREMT certification; Medical Math -instructs how to prepare, calculate, and administer medications; Anatomy and Physiology -instructs the structures and functions of the 11 organ systems and how to identify the anatomical structures and their functions on cadavers in the laboratory; Physical Examination -instructs patient interaction, history taking, physical examination techniques, clinical decision making, and documentation and introduces students to radiology and laboratory procedures; Clinical Medicine-instructs pathophysiology, pharmacology, preventive medicine and medical management of weapons of mass destruction; Dental -instructs the basic emergency dental care in an austere environment; Advanced Cardiac Life Support (ACLS) - certifies students in ACLS through the AHA approved curriculum; Pediatric Education for Prehospital Professionals (PEPP) -certifies students in PEPP through the approved PEPP curriculum; Military Medicine -instructs medical planning in support of tactical operations, preventive medicine and weapons of mass destruction; Trauma -instructs pathophysiology, assessment, and management of traumatic injuries; Advanced Trauma Practical Skills -instructs intravenous and intraosseous access, endotracheal intubation, needle decompression, tourniquet application, nasogastric

The course provide training in Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; patient management skills; pre-hospital trauma emergencies and care; tactical combat casualty care skills; operating room procedures; minor surgical skills; NREMT-Basic examination; obstetrics/gynecology and pediatric emergencies; cardiac pharmacology; Advanced Cardiac Life Support (ACLS); EMT Paramedic clinical rotation and field internship consists of a 2-week hospital rotation in the emergency department, labor and delivery, surgical intensive care, pediatric emergency department, operating room, and a 2-week ambulance rotation with an assignment to an Advanced Life Support EMS unit responsible for responding to a variety of 911 emergency calls; USSOCOM EMT-Paramedic exam; care of the trauma patient in a field environment; preventive medicine; Nuclear, Biological and Chemical (NBC) casualty care, and nursing care; 30 hours of clinical rotations in clinics located on Fort Bragg, NC, conducting sick call under the supervision of a physician or physician's assistant.
Environmental emergencies (altitude, heat, snake bite, insect bite, cold injury), airway management, physical therapy evaluation, pharmacology, shock, thoracic trauma, airway oxygenation and ventilation, TBI, thermal trauma, crush injury, austere planning and evacuation, mass casualty management, field blood transfusion, patient movement techniques, animal care, medical emergencies in canines, shearing and aid bag packing, trauma skills (airway, patient assessment, surgical cric, intubation, TCCC, wound dressing, tourniquet, orthopedic injuries/splints, IV, hypovolemic shock, triage, control bleeding, NCD, neurological exam, vital signs, manage burns, cardiac arrest/ECG)

Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; prehospital trauma emergencies; patient management tasks/skills; advanced trauma skills; operating room procedures; minor surgical skills; obstetric and pediatric emergencies; crdiac pharmacology; Advanced Cardiac Life Support (ACLS), clinical/ambulance rotation; extended care to the trauma patient in a field environment; mass casualty; military triage system; medical mission planning; medical threat; preventive medicine; physical examination; veterinary; dental laboratory; medical diseases and case studies; nursing; initial and long-term wound care; echelons of care (EOC) including training in combat trauma management, UW hospital, surgical procedures, preanesthesia, anesthesia, postanesthesia care, nursing care, records and reports, radiology, and central materials supply; attends a special operations clinical training site (30 days at a U.S. Army medical training facility within CONUS) including clinical training/experience and evaluation on ability to apply patient assemssment/management/care skills in various clinical settings; rotations through surgery, dermatology, pediatrics, orthopedics, radiology, preventive medicine/community health, and the outpatient/family practice clinic.
The course content consists of Civil Information Management, Medical Information and Intelligence, Civil Medical Engagements, Civil Reconnaissance, Occupational and Environmental Assessments, Arthropod-borne Disease Risk Management, Host Nation Food and Water Risk Management, and Veterinary and Agricultural Studies.

The course will familiarize attendees with the US SOCOM Mission, roles and capabilities with focus on medical operations in the joint SOF setting. Areas of emphasis will include operations/plans, current lessons learned, intelligence, medical force protection, operational risk assessment, health surveillance and SOF relevant clinical subjects.
Learning objectives: Describe NATO Medical Command and Control structures: Given a scenario, students from different nations and cultures will be able to describe NATO command, control, and force structures in accordance with current practices. Comprehend NATO Comprehensive operational planning process and medical support: Given a scenario, students will explain terms and procedures used to support the NATO comprehensive operational planning process (COPD & OPP) and multinational medical support planning. Understand NATO Medical Doctrine: Given a scenario, students will describe the different levels and content of medical support doctrine and policies. Synthesize NATO Operational Medical Planning Process: Given scenarios, students will develop a medical support plan IAW references that details the required components of a medical support plan within military, humanitarian, and joint multinational operations. Apply Multinational aspects of Medical Support applications: Given scenarios, students will develop a Medical ConOps IAW with references that outline key considerations for joint multinational medical support planning within military, humanitarian, and joint operations.

Students will receive both didactic and clinical training required for application and testing as an NREMT-Paramedic.
This course consists of 2-weeks of class room didactics in critical care medicine and path physiology, key elements of enroute critical care, and 6-weeks of in hospital practical experience, ground, and air ambulance observation with San Antonio EMS, and air ambulance observation with local providers of this care.
Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of combat chest wounds, and lifesaving emergency surgical skills on high fidelity simulation manikins. Students will conduct scenarios in both clinical environment and high fidelity aircraft environment. All scenarios and exercises will refresh critical care knowledge and provide recertification for the NRP.

Phase 1 (9 weeks 1 day) didactic study includes: basic anatomy and physiology; vital signs, cardiopulmonary resuscitation; principles and methods of decontamination, sterilization and disinfection; storage and handling of sterile supplies; identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metalware; duties of the scrub and circulating technician; principles and practices of sterile technique and standard precautions; transporting and positioning patients; operating room safety; handling of specimens, medications, dyes and hemostatic agents; and surgical specialties as they relate to selected surgical procedures. An FTX is also incorporated into the course. Phase 2 (10 weeks) is on-the-job training in the clinical environment. Total course length: 19 weeks 1 day
Supervised OJT focuses on the principles of surgical technology practice, and the instruments, supplies, and equipment for surgical procedures. Clinical study and practicum includes anatomy and physiology, vital signs, cardiopulmonary resuscitation, principles and methods of sterilization and disinfection, storage and handling of sterile supplies, identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metal ware, duties of the scrub and circulating technician, principles and practices of sterile technique and standard precautions, transporting and positioning patients, operating room safety, handling of specimens, medications, dyes and hemostatic agents, and surgical specialties as they relate to selected surgical procedures.
The consolidated curriculum will include didactic critical care nursing theory, patient movement, and operational environment training, followed by 9-weeks of clinical tracks in medical and surgical intensive care units and the emergency department training at San Antonio Military Medical Center (SAMMC) focusing in specialty area
The consolidated curriculum will include emergency/trauma and critical care theory, patient movement, and operational environment training followed by 9-weeks of clinical tracks in the emergency department and medical and surgical intensive care units focusing in specialty area.

Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support.
Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support.The program stresses following review of problems and complications in exodontia and oral surgery; the emergency treatment, evacuation, and definitive care of patients with traumatic injuries of the maxillae, mandible, and facial bones associated with the dental arches; diagnostic procedures, anesthesia and extraoral roentgenographic techniques for oral surgery; differential diagnosis of infections of the mouth, head, and neck; dentoalveolar surgery, control of hemorrhage, diagnosis and treatment of shock, tracheotomy; and management of maxillary sinus complications associated with oral surgery procedures. The pathology and treatment of oral keratoses, odontogenic cysts and tumors as well as the role of the dentist in the management of benign and malignant oral lesions is discussed. Principles and trends in antibiotic and chemotherapy receive considerable attention.

Phase 1 didactics last approximately 16 months. During this time, students are exposed to the basic medical sciences and progress into clinical medicine courses that help them understand critical medical concepts and application of those concepts in patient scenarios. Phase 2 training lasts approximately 13 months (including hospital orientation and mandatory facility training). During that time, students rotate through a variety of clinics in order to gain clinical knowledge and experience.

Advanced mechanical ventilation, emergency burn evaluation and care, emergency neck and chest trauma, emergency pediatric trauma, emergency pregnancy related injuries, emergency shock evaluation and treatment, emergency stabilization and trainsfer, emergency trauma assessment, head trauma, pediatric heat and cold submersion, transport nursing safety and survival, trauma in the elderly, trauma of the muscular and skeletal systems, trauma to the abdomen, traumatic submersion injuries

Pathophysiology, pharmacology, 12-lead ECG interpretation, interpretation of lab values, interpretation of routine diagnostic images, ventilator management, aortic balloon pump management, and air medical concepts
Epidemiology of hazardous materials, toxic inhalations, pesticide poisoning, corrosives, hydrocarbons, halogenated hydrocarbons, miscellaneous toxicants, toxic terroism (chemical, biological, radiological and nuclear incidents); by completion of the course, participants will be able to rapidly assess hazmat patients, recognize toxic syndromes (toxidromes), discuss the medical management of hazmat patients, apply the poisoning paradigm, and identify and recognize appropriate administration of specific antidotes

Discusses the differences between typical TCCC and PFC, with a focus on certain interventions that vary between TCCC and PFC: patient monitoring, resuscitation, ventilation, definitive airway control, pain control, exam and diagnostics, nursing/hygiene/comfort, advanced surgical measures, telemedicine consult, and preparing for transport. The objectives are to increase 68W Medic education and awareness of common medical/trauma issues that require further training than what is taught in AIT, establish a base in common nursing skills, and assist caring for patients; often when a provider is not available.
#REF!
LOAC, code of conduct, AFMS mission, C3i, vehicle/aircraft patient loading, litter carries

	Course Content -		
Course Breakout	**JTTS**	**TCCC**	**Clinical Practice Guidelines**
Deployment Adminstration (8hrs), Core Content (25.5hrs), Skill Training(7hrs), Operational Training(17.5hrs), Corps Specific Training(45hrs for each discipline, ie physicians, nurses, respiratory therapists)			
Deployment Administration (5hrs), Core Content (12.5hrs), Skills Training(5.5hrs), Operational Training(17hrs)		X	
Doctrine (hrs), Altitude Physiology (hrs), Clinical (hrs), Operational (hrs)			

Phase I: 5 day didactic and simulation training, focus on TCCC topics and CPGs, providers attend the Advanced Surgical Skills for Exposure in Trauma course and the Combat Extremity Surgery Course. Uses a 5-person team approach, with TeamSTEPPS. Concludes with intensive situational training exercise. Phase II: Clinical rotation schedule. Members rotate through trauma resuscitation unit and operating room and trauma intensive care unit, using TeamSTEPPS and the 5-person team approach. Phase III: Capstone Exercise, trainees assume control of the trauma resucitation unit, observation area, and trauma operating room at Ryder for a set period of continuous operations. FST members manage all patients who arrive at the trauma center. Train on live patients.	X	X	X
Day1: Processing, Day 2-4:Specific trauma certificaiton courses (ATLS, PHTLS, TNCC), Day 4-6: TC3, Village Stability Operations, MASCAL lane, Tactical Medicine Movement Course, Military Operations on Urban Terrain VIRTRA simulation, Role 2 simulation, TACEVAC UH60 Simulation, PFC, Medical Leadership, Day 7: PFC training exercise (FTX), Day 8: CBRNE training		X	X

Initial Assessment and Mangement, Airway and Ventilatory Management, Shock, Thoracic Trauma, Abdominal Trauma, Skills Stations, Surgical Skills, Head Trauma, Spine and Spinal Cord Trauma, Musculoskeltal Trauma, Cold/heat Injuries, Extreme ages, Trauma in women, Transfer to definitive care, Austere Environement			
Kinematics of Trauma, Patient Assessment, Airway Management, Shock and Fluid Replacement, Spine Trauma, Pediatric Trauma, Thoracic Trauma, Abdominal Trauma/Trauma in Pregnancy, Head Trauma, Musculoskeltal Trauma, Thermal Trauma			
Trauma Nursing Core Course and Trauma Nursing, Biomechanis and MOI, Initial Assessment, Shock, Brain and Cranial-facial Trauma, Thoracic and Neck Trauma, Geriatric Trauma, Abdominal Trauma, Spinal Cord and Vertbral Column Trauma, Musculoskeletal Trauma, Burn Trauma, Trauma and Pregnancy, Pediatric Trauma, Psychosocial Aspect of Trauma Care, Stabilization, Transfer and Transport, Battlefield Triage, Battlefield Wounds			
Didactic(20hs), Cadaver Lab (6.5hrs), LT Lab (2.5hrs)	X		X

Module 1: ITLS Assessment Skills Training and Testing, Module 2: BDLS, Module 3: Combat Sressor Awareness/TBI, Module 4: Cadaver Lab, Module 5: LT Laboratory, Module 6: Combat Trauma Lanes/MASCAL Exercise, Simulation Lab, Ambulance Ride-along, Module 8: Level 1 Trauma Rotation			
2 days of extreme physiology (Transport physiology, Biodynamics, Environmental extremes). 2 days of clinical aspects of retrieval medicine (Pathophysiology, Clinical concerns, Transportable medcial equipment). 2 days of logistic & command issues in medical transport (Organisation, Medicolegal issues, Standards and safety).			
Laboratory (3 weeks), Medicine (5 weeks), Surgey/Anesthesia/Nusing (4 weeks), Dental (1 weeks), Spec Ops Clinical Training (4 weeks), Gurerilla Hospital Methods (I weeks), Veterniary (2 weeks)			
JTTS, Clinical Practice Guidelines, Initial Triage and Assessment, Neurotrauma, Ocular Trauma, Neck Injuries, Traumatic and Difficult Airway, Thoracic Trauma, Spinal Trauma, Abdominal Pelvic Trauma, Perineal Trauma, Orthopedic Trauma, Traumatic Amputations, DCR and Blood Products, Pediatric Trauma, Patient Handling, Disposition of Remains, Medical Ethics, Battlefield Afghanistan and Current Injury Patterns, Psychosocial Aspects, Wounded Warrior Panel Discussion, Mild TBI, TMIP	X		X

Breakouts for specific subspecialties include: orthopedic, general surgery, emergency medicine, anesthesia, nursing, etc.			

1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care 4. Tactical Evacuation Care 5. Scenarios for TCCC		X	
1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care #1 4. Tactical Field Care #2 5. Tactical Field Care #3 6. Tactical Evacuation Care 7. Direct from the Battlefield		X	

Phase 1: Direct Threat Care (emphasis on mitigating the threat, moving the wounded to an area of relative safety, managing massive hemorrhage, rapid positional airway management if feasible), Phase 2: Indirect Threat Care (once casualty is in an area of relative safety, assessment and treatment priorities focus on preventable causes of death - major hemorrhage, airway, breathing/respirations, circulation, head and hypothermia, and everything else (MARCHE)), Phase 3:Evacuation care (moving the casualty toward a defnitive treatment facility while performing reassessment of interventions and hypothermia management)		x	
Phase I: Mandatory distance learning modules covering Aeromedical and Aviation specific content areas. Phase II: 12 day residence course with additional didactic content and extensive hands-on practical exercises, culminating with comprehensive written exam and graded practical exams on equipment and Critical Care Transport simulation.			
Phase I: Distributed Learning phase available thru BlackBoard. Covers 63 hours of medical and aeromedical subjects relevant to performing tasks required by a flight medic in the follow-on training during Phase II. Phase II: covers knowledge and skills in the areas of ACLS, Flight Medic Pharmacology, Drug Dosage Calculations, ITLS, PEPP, critical care management of a patient in a medical evacuation aircraft platform, Rapid Sequence Induction, Helicopter Underwater Egress Training, High Altitude Chamber, Personal Recover Operations, Survival Training, Canine Trauma Management.			

Rotation: 16 days. Day 1-4 in Intermediate Staging Base, days 5-16 spent performing the exercise itself. Three operational phases: insertion and counter-insurgency operation, defense in response to attack, and attack into a MOUT complex. Mission Readiness Exericse: 12 days, include legally intense issues associated with a peacekeeping deployment. Exercises attempt to replicate the Collocated Operating Base (COBs) and issues that will be encountered by the unit in the region.			
Each topic presented in PowerPoint format. At the end of the course, students will practice their procedural/emergency surgerical skills in a live tissue lab. Final event is trauma lanes conducted in a field environment that will progress through three phases of care: care under fire, tactical field care, and casevac - the trauma lanes are aimed at tying in all of the information presented throughout the course, will culminate with surgical skill exposure designed to match the trauma lane scenario. Small group AAR after each scenario.			

Skill stations: Initial assessment and management Airway and ventilatory management Pediatric Trauma Hemorrhagic shock Spine and extremity injuries Head trauma			
Chapter 1: Ch2: Initial assessment and management Ch3: Airway management and smoke inhalation injury Ch4: Shock and fluid resuscitation Ch5: Burn wound management Ch6: Electrical injury Ch7: Chemical burns Ch8: Pediatric burn injuries Ch9: Stabilization, transfer, and transport Ch10: Burn disaster management			
The Health Care Specialist receives specific training in the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of wounding, triage, primary and secondary survey of combat causalities, airway management, extremity trauma, chest trauma, thermal burns, wound management in the combat environment, splinting and dressing. Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of chest wounds, packing of medical treatment bags, life-saving emergency surgical skills, and the evaluation and management of mass causalities utilizing simulated combat casualty scenarios		X	

		X	
Objectives: Demonstrate knowledge of key anatomical exposures for the care of injured and acutely ill surgical patients Demonstrate technical ability to expose important structures that may require acute surgical intervention to save life or limb Gain confidence in performing anatomic exposures independently Faculty assessment of a student's ability to independently perform anatomical exposures will be satisfactory			X
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone			

Chapters: Assessment of critically ill child, airway management, pediatric cardiac arrest, diagnosis and management of the child with acute upper and lower airway disease, mechanical ventilation, diagnosis and management of shock, acute infections, fluids/electrolytes/neuroendocrine metabolic derangements, traumatic injuries in children, pediatric burn injury, nonaccidental injuries diagnosis and management, pediatric emergency preparedness, management of the poisoned child, transport of the critically ill child, neurologic emergencies, management of the child with congential heart disease, oncologic and hematologic emergencies and complications, acute kidney injury, postoperative management, sedation/analgesia/neuromuscular blockade, invasive medical devices			

Initial assessment and management, airway and ventilatory management (including cricothyroidotomy), shock assessment and management, venous cutdown, thoracic trauma (x-ray identification of thoracic injuries, chest trauma management), abdominal and pelvic trauma (focused assessment sonography in trauma - FAST, diagnostic peritoneal lavage), head and neck trauma assessment and management, x-ray identification of spine injuries, spinal cord injury assessment and management, musculoskeletal trauma assessment and management, thermal injuries, pediatric trauma, geriatric trauma, trauma in pregnancy and intimate partner violence, transfer to definitive care			
			x

The course consists of a precourse preparation package that includes a CD-ROM outlining objectives and demonstrating surgical repair. Participants are to review exposures dealing with penetrating injuries, with commentary by experts in the field of penetrating trauma management. Participants then complete a precourse multiple choice question examination and self-efficacy test. They are then provided with a manual outlining the injuries and a critique of injury approaches with appropriate references, together with a textbook on managing specific injuries derived from writings by experts in the field of trauma (this textbook describes clinical trauma scenarios with experts' preferred surgical techniques for management of these injuries, complete with full illustrations). On the day of the course, the sessions begin with six lectures: the program's development, trauma laporotomy, liver injuries, injuries to the stomach, duodenum and pancreas, splenic injuries, genitourinary trauma and cardiac and vascular injuries. After the lecture sessions, the participants gown and glove and are introduced into a fully equipped and staffed OR. At this point the trainee-instructor ratio is 1:1. Standardized injuries are created on a live porcine model, the participant is given clinical scenarios, and then tested according to standardized criteria for their			x
Course curriculum objectives include descibing components of state, regional and local trauma system, identifying components of an effective trauma system, describing what is necessary to prepare for local hospital's treatment of the critically injured trauma patient, outlining the components of the primary survey, decision for transfer to definitive care and the secondary survey, demonstration of the concepts of the primary survey, decsion for transfer to defnitive care and secondary survey as applied in simulated injured patient scenarios			x

Understanding surgical problems, injury patterns and issues that may result from disasters, discussion of the role that surgeons can play in planning for and responding to mass casualty incidents and disasters, especially at a hospital level, familiarization of terms and concepts of incident command, understanding the principles and challenges of disaster triage, familiarization with treatment principles related to blast injury, chemical attacks and radiological dispersal devices, knowing the civilian and military assets available for support			x
Training components include population scenarios discussion, mass casualty triage tabletop and situational training exercises, surge tabletop scenario for health care facilities, personal protective equipment skills performance and decontamination review, casualty management in small groups with simulated scenarios and emergency operations center situational training exercise. This course is the application of the knowledge obtained in the CDLS and BDLS courses			x

Pediatric assessment, airway procedures, cardiovascular procedures, pediatric specific airway, central nervous system, medical emergencies, cardiovascular system, trauma, non-traumatic surgical emergencies, special needs populations, metabolic diseases, toxicology ingestions and smoke inhalation, child maltreatment; additonal topics can be chosen from the following list: preparedness for pediatric emergencies, environmental emergencies, non-traumatic orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia, interface with EMS, disaster management, preparedness for acts of nuclear, biological and chemical terrorism, medical-legal considerations, mock codes, pediatric emergency radiology, advanced trauma procedures, office emergencies, rapid sequence intubation, advanced airway procedures, advanced trauma procedures, splinting procedures, wound closure procedures			x
Patient assessment, wilderness wound management, HEENT and dermatology, splinting and dislocations, cervical spine and patient movement, hypothermia wraps and patient packaging, legal issues, medical problems, avalanch, altitude illness (including pulmonary and cerebral edema), hypothermia/frostbite, hyperthermia, water purification and hydration, medical kits, lightening, animal injuries, bites and stings, dive medicine, submersion injuries, infectious disease			x

DISASTER paradigm (Detect, Incident Command, Scene Security and Safety, Assess Hazards, Support, Triage and Treatment, Evaluation, Recovery), natural disasters, traumatic and explosive events, nuclear and radiological events, biological events, chemical events, psychological aspects, public health implications of disasters			x
Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, vascular access station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study			x

Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study			x
Scene size-up, standard precautions, patient assessment and management, trauma in pregnancy, elderly trauma, shock evaluation and management, trauma in children, head trauma, airway management, thoracic trauma, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skills stations: basic airway management, short SMR devices/emergency rescue and rapid extraction, traction splints, helmet management/log roll/long backboard, patient assessment and management			x

Standard precautions, scene size-up, patient assessment and management, trauma arrest, trauma in pregnancy, elderly trauma, trauma in children, thoracic trauma, head trauma, airway management, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skill stations: basic and advanced airway management, short SMR devices/emergency rescue and rapid extrication, traction splints, helmet management/log roll/long backboard, chest decompression/fluid resuscitation, patient assessment and management			x
The didactic portion of the course includes; assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices			x
In addition to the didactic portion, the procedures covered include disarming the supplemental restraint system, stabilizing a vehicle on its wheels, on its roof, on its side and temporarily with improvised materials, opening a door from a hinge or bolt mechanism, removing a roof from back to front, dropping a roof from a vehicle on its side, removing the floor assembly from a vehicle, moving the steering column/wheel, moving the dash/front end, dropping the sides of a wrecked vehicle, lifting a vehicle off a patient trapped underneath, packaging the patient for removal, using a long spine board and straps or rope sling			

In addition to the didactic portion, the skills station session covers patient assessment and management, basic and advanced airway management, spine management: short SMR devices/emergency rescue and rapid extrication, spine management, helmet management/log roll/long backboard, traction splints, chest decompression/fluid resuscitation/hemorrhage control		x	x
Recognition and treatment of infants and children ast risk for cardiopulmonary arrest, systematic approach to pediatric resuscitation, effective respiratory management, validation of skills for one-person and two-person CPR and AED skills for infants and childresn, defibrillation and synchronized cardioversion, intraosseous access and fluid bolus administration, effective resuscitation team dynamics			x
Course summary includes describing the physiology and kinematics of injury, understanding the need for rapid assessment of the trauma patient, transporting patients to the appropriate medical facility depending on their injuries, advancing the level of knowledge in regard to examination and diagnostic skills, enhancing performance in assessment and treatment of the trauma patient, advancing the level of competence in regard to specific prehospital trauma intervention skills, and establishment of management methods for prehospital care of the multisystem trauma patient			x

General concepts in wilderness medicine, patient assessment system, critical systems, spine assessment and treatment , musculoskeletal, limb splinting, dislocation reduction demo and practice, skin, soft tissues and burns, thermoregulation, cold injuries, altitude, anaphylaxis, SCUBA, lightening, submersion, ALS treatment, tools and medications, appropriate technology, SAR/organization, expedition practitioner/backcountry medicine, first aid kits, toxins, bites and stings, medical legal			x
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure			x
Patient assessment system, documentation, medical legal, CPR in the wilderness, spinal cord injuries, long-term patient care, chest injuries, shock, head injuries, wilderness wound management, athletic injuries, fracture management and traction splinting, dislocations, cold injuries, heat illness, altitude illness, cardiac, respiratory and neurological emergencies, abdominal injuries, mental health emergencies, bites, stings and poisoning, allergies and anaphylaxis, diabetes, search and rescue, leadership, teamwork and communication, communicable disease, lightning, submersion, urinary and reproductive system issues, medical decision-making, common wilderness medical problems, wilderness drug and First Aid kits			x

Patient assessment, management of life threats and scene safety, management of head, spine and musculoskeletal injury with minimal equipment, heat and cold emergency management, understanding of the limits and utility of ALS in the wilderness, preparation and packing of medical and personal gear, organization, leadership and participation in a simulated wilderness evacuation, emergency and extended medical care appropriate to a remote wilderness setting using available resources, appropriate attire for different conditions, food preparation using field rations and propane stove, performance of leave-no-trace skills, proficiency in expedition's mode of travel, expidition behaviors (teamwork, group decision making support, positive attitude during diversity), leadership skills, demonstration of sound judgement and decision making			
Role of expedition medical officer, patient assessment, lifting and moving patients, litter packaging, immobilization and carrying techniques, medical legal issues in remote care, lightning, hypothermia, frostbite, heat illness, trauma review and long term considerations, long term wound care, stapling and suturing, athletic injury management and taping, joint reductions, fracture management, spinal injury assessment and management, medical emergencies in remote settings, eye injuries, dental emergencies, search and rescue, survival lab, expedition health and hygiene, gender medicine, psychological emergencies, tropical medicine and travel considerations, altitude illness, dive emergencies, animal attacks and envenomations, evacuations and rescue considerations, mass casualty/triage exercise, expedition/remote site medical kits and clnics			

Role of the medic in the remote area, patient assessment, lifting and moving patients, medical legal issues in remote care, hypothermia, frostbite and non-freezing cold injuries, heat illness, altitude illness, dive emergencies, animal attacks and envenomations, tropical medicine and travel considerations, expedition health and hygiene, CPR for the healthcare provider, airway management, IV therapy, kinematics of trauma, shock and fluid replacement, spinal injury assessment and management, litter packaging, imobilization and carrying techniques, extrication techniques, head injuries, thoracic trauma, mass casualty/triage, abdominal trauma, thermal trauma, soft tissue injuries trauma lab, essentials of prehospital care, athletic injury management and taping, dislocation management, fracture management, geriatric considerations, pediatric considerations, primary care/sick call, eye injuries, gender medicine, pain management, dental emergencies, psychological emergencies, acute abdominal illness, search and rescue, survival lab, medical emergencies, expedition/remote site medical kits and clinic			x
Differentiating between high-risk and convential medicine, top causes of preventable death in high-risk scenarios, identifying and treating life-threatening injuries, high-threat extraction techniques, mass casualty incidents, wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries		x	
The course teaches an effective approach to patients presenting with a wide range of illnesses and injuries including trauma, cardiac, strokes, pediatric, obstetric, neonatal, airway compromise, sepsis, and neurological conditions			x

The course consists of seven different blocks of instruction each lasting twenty-five working days. The blocks are structured to progress a student from having no medical background to performing and understanding acute life-saving interventions in 36 weeks.			

Medical Fundamentals (7weeks), SOCM Trauma Modules (7 weeks), Clinical Internship (4 weeks), Military medicine (3 weeks)			
Week One: Week one covers refresher training for PALS, ACLS, BLS, TCCC, and some "hands on" emergency training. Week Two: Covers Basic Trauma Skills, PHTLS Review, WMD, Environmental emergencies, Field Training Exercise, and General Medicine.			

The course is divided into 2 phases. Phase I is the Special Operations Combat Medic (SOCM) - course. Students are Ranger Medics, Recon(NEC 8427), SEAL(NEC 5392), and SBU(NEC 5392) students (6 months in length). Phase II is the SFMS/SOIDC – referred to as “The Long Course” (1 year in length to include SOCM). Usually Navy Recon students will return to complete the SFMS/SOIDC portion after a successful tour with an operational unit. The course consists of 5 academic modules: Laboratory Subjects, Veterinary Medicine, Surgery, Anesthesia, Records and Reports (SARR), a 24 day Special Operations Clinical Training rotation, and Special Forces Medical Sergeant Roles and Responsibilities. From start to finish, SFQC for a Special Forces Medical Sergeant lasts 60 weeks, including actual medical training of about 15 weeks.			

Surgeon briefings from USSOCOM and Service Components, CSO, State Department, ASD/SOLIC (SSTR), and NGOs; SOF functional and regional briefings to include; CA, JSOTF C2, JPRA, EPW issues, Interagency Collaboration, USSOCOM Care Coalition, Medical Training, Logistics and Intelligence.			
This one-week course is comprised of lectures and syndicate work which result in syndicate presentations. Day 1 provides a broad overview of NATO structures and its operational and medical support planning processes. Day 2 focusses on NATO comprehensive operational planning directive (COPD) and the NATO operational planning process (OPP) with an emphasis on how Medical Support planning contributes to them. Day 3 concentrates on supporting operations in different environments and special planning considerations. Day 4 and 5 are syndicate-focused with an emphasis on developing and presenting a concept of operation for medical support within a joint multinational operation.			

Phase 1 (16 months, didactic): Freshman term: (course name - semester hours): Anatomy and Physiology I - 7 Biochemistry - 3 Microbiology - 5 Clinical Laboratory - 4 Medical Law and Ethics - 2 Research Evaluation - 2 Sophomore term: Anatomy and Physiology II - 7 Pathology - 3 Pharmacology I - 3 Radiology - 2 Psy Psychiatry - 3 EKG - 2 Endocrinology - 2 Military Publich Health and Dental - 2 Patient Evaluation I - 3 Junior term: Orthopedics - 4 Pulmonary - 2 Gastroenterology - 2 Cardiology - 4 Clinical Correlations I - 1			

Phase 1: online self-paced study, building on material and skills gained through military schooling and experience. Phase 2: clinical rotations and practicals provided at/near T1G Memphis. Phase 3: testing of practical skills and written test for final certification.			
Phase 1: high angle rescue. Phase 2: confined space/collapsed structure and vehicle extrication. 4-6 hours didactic followed by hands on practice.			

BLS, ACLS, PALS, PHTLS, dental emergencies, dental anesthesia with lab, regional anesthesia and lab, environmental emergencies (heat, cold, HAPE, HACE, MS, diving), exam and diagnosis of common musculoskeletal injuries with lab, medical mission planning, mass casualty management, medical bag packing, casualty evacuation and lab (military oriented platforms), advanced suturing techniques with lab, examination and diagnosis of somatic disorders (manual medicine) with lab, behavioral emergencies, complications of geriatrics, trauma patient assessment/treatment/management with lab, trauma skills practical vivarian lab			
General principles of nursing practice (transport physiology, scene operations, communications, safety and survival, management of man-made disasters, professional issues, management), Resuscitation principles (principles of assessment and patient preparation, airway management, mechanical ventilation, perfusion), trauma (principles of management, neurologic, thoracic, abdominal, orthopedic, burn, maxillofacial and neck), Medical emergencies (neurologic, cardiovascular, pulmonary, abdominal, electrolyte disturbances, metabolic and endocrine, hematology, renal, infectious and communicable diseases, shock, environmental and toxicological emergencies), Special populations (obstetrical patients, pediatric trauma and medical patients, geriatric trauma and medical patients, bariatric patients)			x

Preparatory topics: concepts and components of critical care, air medical considerations, transport physiology, lab data, basic radiographic interpretation, peripheral and central lines, hemodynamic monitoring, blood administration; Medical topics: respiratory, advanced airway, mechanical ventilation, pharmacology (neuro system), cardiology, 12-lead EKG interpretation, circulatory pharmacology, sepsis/MODS, gastrointestinal, renal urological, neuro/ICP, endocrinology, hematology; Trauma: burn and trauma care; Special populations: pediatrics, high risk obstetrics, fetal heart monitoring			x
General Principles of AHLS: hazardous materials epidemiology, important properties of hazardous materials, medical mangement of hazmat victims; Toxic inhalations: irritant gases, asphyxiants, antidotes (normobaric oxygen, hyperbaric oxygen, methylene blue, amyl nitrite, sodium nitrite, sodium thiosulfate, hydroxocobalamin; Insecticide poisoning: organophosphate and carbamate insecticides, antidotes (pralidoxime, atropine); Scenarios (tabletop exercises); Corrosives, hydrocarbons and substituted hydrocarbons; Miscellaneous toxicants; hydrazines, antidote (pyridoxine), hydrofluoric acid, antidote (calcium gluconate, calcium chloride); Toxic terrorism: an introduction to chemical, biological, radiological and nuclear terrorism, chemoterrorism - nerve agents, bioterrorism, radiation emergencies; additional tabletop exercises, mandatory exam			x

Day I Skills Lab Vital Signs, Oxygen use and set up, Airway clearance and BVM support, NC/NRBM, OPA, NPA, Suction, Sterile Gloves, Foley, NG/OG, Vaginal Delivery, Suture/Staples insertion and removal, Patient Positioning/turning/nursing skills, Oral care/ wound care Day II Skills Lab IV Insertion and removal, IV maintenance drips, IV Push , Cric insertion/removal, Intubation, Patient Scenarios Day III Classroom Acute Renal Failure/Acute Kidney Injury, ARDS, PEEP, SEPSIS, Pharmacology, Nursing Skills, Burns, Ventilator/Suction use (Memo generating CME credit provided) ICU Rotation: This will be a culminating event rotating through ICU/ER/Wards at Womack to employ skills learned and shadow nursing staff for patient care.			
#REF!			
12-18 hour hands=on exercise in a deployed scenario			

					Course Content - Other E	
Initial Traige & Assessment	Neuro Trauma	Ocular Trauma	Head Trauma	Neck Injuries	Traumatic & Difficult Airway	Thoracic Trauma
X	X	X	X	X	X	X
X					X	
					X	

X		X	X		X	X
X		X	X	X	X	X

X			X		X	X
X			X		X	X
X			X	X		X
X		X	X	X		X

X	X	X		X	X	X

X				X	X	X

x	x	x	x	x	X	x
x	x	x	x	x	X	x

x	x	x	x	x		x

X					X	X

X				X	X	X
X					X	
X					X	X

X						
X				X		X

X	X				X	

x	x	x	x	x	x	x

	x					x
x					x	

x						
x						

x			x	x	x	x
x	x	x	x	x		

x						
x						

x						
x			x		x	x

x			x		x	x
x			x		x	x

x			x		x	x
x						
x			x	x	x	x

x	x	x	x	x	x	
x			x			x
x			x			x

x			x			x
x		x	x	x		x

x		x	x	x	x	x
x			x			x
x					x	

X						
X						

x	x	x	x	x	x	x

					x	
x						

xisting						
Spinal Trauma	Abdominal & Pelvic Trauma	Perineal Trauma	Orthopedic Trauma	Traumatic Amputations & Wound Management	Damage Control Resuscitation & Blood Products	Pediatric Trauma
X	X		X	X	X	

	X		X	X	X	
X	X				X	X

X	X	X			X	
X	X				X	X
X	X					X
X	X		X	X	X	X

				X		
X	X	X	X	X	X	X

	X		X	X	X	

x	x	x	x	X		
x	X	x	x	X	X	

x	x	x	x	x		

			X	X	X	

X	X					X
					X	X
			X			

	X		X	X		
	X		X	X		X

						X

x	x	x	x	x	x	

	x	x				
					x	x

						x

x	x		x			x
x			x			

						x

						x
x	x		x	x		x

x	x		x	x		x
x	x		x	x		x

x	x		x	x	x	x
x	x		x	x		x

x						
x	x		x			

x	x		x			
x	x		x			

x	x		x			x
						x

						X

x	x		x			x

						x

Patient Handling	**Disposition of Human Remains**	**Medical Ethics**	**Battlefield Afghanistan & Current Injury Patterns**	**Psychosocial Aspects**	**Wounded Warrier Panel Discussion**	**TBI**
X						
X						
X						

X	X					X
X			X	X		X

X						X
X			X	X		X
X			X			

						X
X	X	X	X	X	X	X

X						X

X						
X			X			

x						

			X			

X						X
X						
			X			

			X			

x						

x						
x		x		x		

x	x	x		x		
x	x	x		x		

				x		
x						

x	x	x		x		
		x		x		

		x		x		
x						

x						
x				x		
x						

x			x			
x						x

x						
x						
x				x		

x		x		x		
x		x		x		

x				x		
x						

X						
X						

x		x		x		x

x						
x						

Genital Trauma	**Documentation TMIP**	**Burns**	**Vascular Injuries**	**Infection Control**	**Equipment**	**Evacuation & Transport**
	X	X		X		X
	X				X	X
	X	X		X	X	X

X		X		X	X	X
		X				

					X	
		X				
		X				X
			X			

	X			X		

		X			X	

		x	x		x	x
		x	x		x	X

		x	x		x	x
					X	X
					X	X

		X				

						X
		X				X
		X			X	X

X			X			
		X				

		X			X	X

x			x			
		x			x	x

					x	x
					x	x

		x		x	x	
				x	x	x

				x	x	x
				x	x	x

				x	x	x
		x			x	x

		x			x	x
		x			x	x
					x	x

		x			x	x
					x	
					x	

		x		x	x	x
				x	x	x
				x	x	x

				x	x	x
				x	x	x

		x		x	x	x
						x

					X	X

		x	x	x	x	x

		x		x	x	x

Flight Line Safety	**Mission Planning**	**MASCAL**	**Team Training**	**Sedation**	**Pharmacology**	**Anatomy Physiology**
X				X	X	
	X					
X	X				X	X

		X	X	X		X
	X	X	X			

		X				

		X				
				X		

					X	

		x	x			
		x	x	x	x	

		x	x			

		X			X	

						X

						X

				X		

			x		x	x

						x
			x			

		x	x			x
		x	x			

				x	x	x

		x	x			
			x			

			x			
			x			

			x			
			x			

			x		x	x
						x

		x				
			x			

	x		x			
	x	x	x			

		x	x			
		x	x			
			x		x	

X	X		X			
			X	X	X	

x	x	x		x	x	x

			x	x	x	x
			x		x	x

Canine Care	**Trauma in Women**	**Extreme Ages**	**Radiology**	**Pregnancy**	**Soft Tissue Debridement**	**Field Critical Care**

X			X			
	X	X		X		

	X	X				
	X			X		
				X		
					X	X

X			X			

						X
						X

						x

						X

					X	

		x		x		x

		x		x		
						x

		x	x			
						x

				x		x
		x		x		

		x		x		
		x		x		

		x		x		
		x				

		x		x		x
	x	x				

						x
						x
						x

						x
	x					x

	x	x		x	x	x
		x		x		

	x	x		x		x

		x	x	x		
			x			

Medical Terminology	**Dental**	**Minor Surgical Skills**	**Musculoskeltal Trauma**	**Surgical Skills (major)**

			X	

			X	
			X	
			X	
				X

	X			

			x	
			x	

			x	

X		X	X	
			X	

x			x	

x				
x				

x				
x				

x		x	x	
			x	

			x	

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Branch	**Course Name**	**Link**
Air Force	Critical Care Air Transport Team Advanced Course (CCATT)	http://ccatt.info/index.php/ccatt/ccat-advanced-course
Air Force	Tactical Critical Care Evacuation Team Course (TCCET)	http://amops.org/wp-content/uploads/2015/04/CCATT-by-Patricio-Bruno-DO.pdf
Air Force	CCATT Course	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.51/afttp3-42.51.pdf
Air Force	CCATT Course	
Air Force	Critical Care Air Tranport Team (CCATT) Initial Course	http://ccatt.info/index.php/main-menu-resources/ccatt-initial/file/198-ccatt-initial-course-information-package

Army	Army Trauma Training Course (ATTC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6H-F31%2F300-F18&crstitle=ARMY+TRAUMA+TRAINING+COURSE&phase= http://ccn.aacnjournals.org/content/35/2/e11.full?sid=14a41642-af9b-4e37-898b-bf8e213046c7
Army	Combat Casualty Care Course (C4)	http://www.dmrti.army.mil/courses.html

Army	Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	http://www.dmrti.army.mil/courses.html
Army	Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	http://www.dmrti.army.mil/courses.html
Army	Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	http://www.dmrti.army.mil/courses.html
All	Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	http://www.dmrti.army.mil/courses.html

Civilian/ Military	Advanced Trauma Training Program (ATTP)	http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_university&ParentId=1320160660184&ParentType=RushUnivLevel4Page&cid=1297690892714&level1-ppp=1320160660114&level3_parent_page=1320160660114&pagename=Rush%2Fcontent_block%2FContentBlockDetail
NATO-UK Airforce	CCAT Foundational Level	http://www.ccat-training.org.uk/
Navy	Special Operations Independent Duty Course	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsIndependentDutyCourse.aspx
Navy	Expeditionary Medical Unit Training	http://www.med.navy.mil/sites/nmotc/nemti/Pages/CourseCatalog.aspx
Navy	Navy Trauma Training Course (NTTC)	http://www.med.navy.mil/sites/nmotc/nemti/nttc/Pages/default.aspx

Navy	Tactical Combat Casualty Care Provider	
Army	Joint Forces Combat Trauma Management Course (JFCTMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6A-F19%2F300-F37&crstitle=JOINT+FORCES+COMBAT+TRAUMA+MANAGEMENT+COURSE&phase=
NATO/Army	Tactical Combat Casualty Care - All Combatants (TC3-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac

NATO/Army	Tactical Combat Casualty Care - Medical Providers (TC3-MP)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum
Civilian	Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac
Civilian	TC3-MP	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum

Civilian	Tactical Emergency Casualty Care (TECC)	http://www.naemt.org/education/tecc
Army	Joint Enroute Care Course (JECC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=c13159f5-f397-4504-ae33-d5c542c8759d
Army	Flight Medic Course (FMC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=73b51009-38ce-4f01-9700-3a8d7d1589fe

Army	JRTC - Combat Training Center (CTC) Program	http://www.globalsecurity.org/military/ops/ctc-jrtc.htm http://www.globalsecurity.org/military/ops/ctc-jrtc-scenario.htm Full description: http://www.apd.army.mil/pdffiles/r350_50.pdf
Army	Tactical Combat Medical Care (TCMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2011&sch=081&crs=6H-F35%2F300-F38&crstitle=TACTICAL+COMBAT+MEDICAL+CARE+(TCMC)&phase= http://www.first.army.mil/diveast/(X(1)S(4qf0inntvvshrk55bv4idcac))/documents/pdf/Coursedescription09.pdf

Civilian	Advanced Trauma Care for Nurses (ATCN) with ATLS	http://www.ucdmc.ucdavis.edu/cppn/classes/atcn.html http://www.traumanurses.org/atcn http://www.atls.in/atcn/courses-details.htm
Civilian	Advanced Burn Life Support (ABLS)	http://www.ameriburn.org/ablscoursedescriptions.php http://www.ameriburn.org/ABLSProviderObjectivesSummary.pdf
Army	Brigade Combat Team Trauma Training (BCT3)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-68W(BCT3)&crstitle=BRIGADE+COMBAT+TEAM+TRAUMA+TRAINING&phase=

Army	Military Transition Team Medical Course (MiTT)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-F40&crstitle=MILITARY+TRANSITION+TEAM+MEDIC+PRE-DEPLOYMENT&phase=
Civilian	Advanced Surgical Skills for Exposure in Trauma (ASSET)	https://www.facs.org/quality%20programs/trauma/education/asset
All	Combat Extremity Surgery Course (CESC)	https://sites.google.com/site/combatextremitysurgerycourse/

	Pediatric Fundamentals of Critical Care Support (PFCCS)	http://www.sccm.org/Fundamentals/PFCCS/Pages/default.aspx
Joint	Joint Medical Operations Course (JMOC)	http://www.dmrti.army.mil/courses.html

	Military Medical Humanitarian Assistance Course (MMHAC)	http://www.cdham.org/mmhac

Joint	Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	http://www.dmrti.army.mil/documents/1_EPRC%20Course%20Descriptions.pdf
Joint	Public Health Emergency Management (PHEM)	http://www.dmrti.army.mil/courses.html
Navy	Shipboard Surgical Trauma Training (S2T2)	

Civilian	*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	https://www.wright.edu/national-center-for-medical-readiness
Civilian	Advanced Trauma Life Support (ATLS)	https://www.facs.org/quality-programs/trauma/atls

Civilian	Advanced Trauma Operative Management (ATOM)	https://www.facs.org/quality-programs/trauma/education/atom
Civilian	Rural Trauma Team Development Course (RTTDC)	https://www.facs.org/quality-programs/trauma/education/rttdc

Civilian	Disaster Management and Emergency Preparedness (DMEP)	https://www.facs.org/quality-programs/trauma/education/dmep
Civilian	Advanced Disaster Life Support (ADLS)	http://www.ndlsf.org/index.php/courses/adls

Civilian	Advanced Pediatric Life Support (APLS)	www.aplsonline.com
Civilian	Advanced Wilderness Life Support (AWLS)	http://awls.org

Civilian	Basic Disaster Life Support (BDLS)	http://www.ndlsf.org/index.php/courses/bdls
Civilian	Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx

Civilian	Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx
Civilian	Core Disaster Life Support (CDLS)	http://www.ndlsf.org/index.php/courses/cdls
Civilian	International Trauma Life Support Basic (ITLS Basic)	https://www.itrauma.org/education/itls-provider/

Civilian	International Trauma Life Support Advanced (ITLS Advanced)	https://www.itrauma.org/education/itls-provider/
Civilian	International Trauma Life Support Pediatric (ITLS Pediatric)	https://www.itrauma.org/education/itls-pediatric/
Civilian	International Trauma Life Support Access (ITLS Access)	https://www.itrauma.org/education/itls-access/

Civilian	International Trauma Life Support Military (ITLS Military)	https://www.itrauma.org/education/itls-military/
Civilian	Pediatric Advanced Life Support (PALS)	http://cpr.heart.org/AHAECC/CPRAndECC/Training/HealthcareProfessional/Pediatric/UCM_476258_PALS.jsp
Civilian	Prehospital Trauma Life Support - Provider (PHTLS)	https://www.naemt.org/education/PHTLS/whatisPHTLS.aspx

Civilian	Wilderness Advanced Life Support (WALS)	https://www.wildmed.com/wilderness-medical-courses/medical-professionals/wilderness-advanced-life-support/
Civilian	Wilderness Medicine for the Professional Practitioner (WMPP)	http://www.nols.edu/wmi/courses/wildmedpandp.shtml
Civilian	Wilderness Upgrade for Medical Professionals (WUMP)	http://www.nols.edu/wmi/courses/wildupgrademedpros.shtml

Civilian	Wilderness Medical Expedition (WME)	http://www.nols.edu/wmi/courses/wilderness_medicine_expeditions.shtml
Civilian	Remote Medicine for the Advanced Provider (RMAP)	https://www.remotemedical.com/training/remote-medicine-for-the-advanced-provider-rmap/

Civilian	Remote Medicine Upgrade and Certification (RMUR)	https://www.remotemedical.com/training/remote-medicine-upgrade-and-recertification-for-emt-rmur/
Civilian	Tactical Medicine Awareness Training (TMAT)	https://www.remotemedical.com/training/tactical-medicine-awareness-training/
Civilian	Comprehensive Advanced Life Support (CALS)	https://calsprogram.org/courses/full-day-provider-course/

Army	Special Operations Combat Medic Course (SOCM)	http://learn.jsomtc.org/ https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2014&sch=331&crs=300-ASIW1&phase=&clsFlag=

Navy	Special Operations Combat Medic Course (SOCM)	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicCourse.aspx
Navy	Special Operations Combat Medical Skills Sustainment Course	Server documents (JSOMTC folder) http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicSkillsSustainmentCourse.aspx https://www.atrrs.army.mil/atrrscc/prerequisites.aspx?fy=2005&sch=331&crs=011-F68&phase=&cls=003&clsflag=&startDate=2005-04-14&endDate=2005-09-22

Army	Special Forces Medical Sergeant (SFMS, 18D)	http://learn.jsomtc.org/ SOCM prereq document http://www.professionalsoldiers.com/forums/showthread.php?t=1483
Army	Special Operations Civil Affairs Medical Sergeant Course	http://learn.jsomtc.org/
Army	Special Forces Medical Sergeant Refresher Course	

Army	Joint Special Operations Medical Orientation Course (JSOMOC)	https://jsou.socom.mil/Pages/CourseInformation.aspx?CourseName=Joint%20Special%20Operations%20Medical%20Orientation%20Course Some info from previous JSOMOOC course
Army/NATO	Joint Medical Planner Course (JMPC)	http://www.natoschool.nato.int/Academics/Resident-Courses/Course-Catalogue/Course-description?ID=85
NATO-UK	HOSPEX Training - Validation Events	

Army	300-F1 Flight Paramedic	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.
Army	300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.
Army	Paramedic (ASI F2) Recertification Course	300-NREMT-P/NRP RECERT POC at COMM: 502-613-5233.

Army	Operating Room Specialist Course Phase 1	301-68D10 Operating Room Specialist Phase 1
Army	Operating Room Specialist Course Phase 2	301-68D10 Operating Room Specialist Phase 2
Army	Critical Care Nursing Course	6F-F5 Critical Care Nursing
Army	Emergency Nursing Course	6F-F6 Emergency Nursing

Army	Management of Burns and Multiple Trauma Course	Special Information: 3698 Chambers Pass, FSH, TX 78234-6315. Send DA 3838 to: DHET, 2421 Hood St., Ste. B., FSH, TX 78234-6315 COMM: 210-295-9428 or DSN: 471-9428.
Army	Oral and Maxillofacial Surgery Course	6H-A0204 Oral and Maxollofacial Surgery Special Information: Course location: Primary: Fort Sam Houston, TX. How to enroll: Send DA 3838 to Graduate Dental Education, 2421 Hood St., Ste. B, FSH, TX 78234 COMM: 210 221-0079 or DSN: 471-0079 FAX: 471-2832.
Air Force	Aeromedical Evacuation (AE)	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.5/afttp3-42.5.pdf
Air Force	Emergency Nursing Pediatric Course (ENPC)	https://www.ena.org/education/ENPC-TNCC/enpc/Pages/aboutcourse.aspx

Navy	Combat Casualty Care Course (C4)	
Navy	C4	
Navy	ATLS and ACLS	
Navy	ATLS and ACLS	
Navy	Navy Trauma Training Course (NTTC)	
Navy	Bushmaster Course	
All	Emergency War Surgery Course (EWSC)	
Navy	Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting	
Navy	Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course	
Army	TBI for Deploying Providers	
Navy	Traumatic Brain Injury 201: Overview for Health Care Personnel	
Navy	Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)	

Navy	Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	
Navy	Tactical Combat Casualty Care (TC3)	
Navy	Combat Extremity Surgery Course (CESC)	
Navy	Trauma Nurse Core Course (TNCC)	
Navy	ACLS	
Army	Joint Enroute Care Course (JECC)	
	Flight Medic Course (FMC)	
Navy	Emergency Nursing Pediatrics Course	
Navy	Advanced Burn Life Support (ABLS)	
Navy	Field Medical Service Technician (FMST) School	
Navy	Infection Control in a Deployed Envirnoment (6A0F22)	https:www.atrrs.army.mil/atrscc/course.aspx.
Navy	Sexual Assault Medical Forensic Examiner SAMFE	

Army	Interservice Physician Assistant Program (IPAP)	http://www.cs.amedd.army.mil/ipap/
All	Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)	https://www.t1g.com/project/medical-certification-courses/
All	NREMT-Paramedic Recertification Course	https://www.t1g.com/project/medical-certification-courses/
All	Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)	https://www.t1g.com/project/medical-certification-courses/

All	National Registry Paramedic Bridge Course	https://www.t1g.com/project/medical-certification-courses/
All	Advanced Combat Trauma Training (ACTT)	https://www.t1g.com/project/provider-level-courses/
All	Advanced Combat Medic Course (ACMC)	https://www.t1g.com/project/provider-level-courses/
All	Prolonged Field Care Course (PFC)	https://www.t1g.com/project/provider-level-courses/
All	Applied Battlefield Medicine (ABM)	https://www.t1g.com/project/medic-specialty-courses/
All	Vehicle Extrication Course (VEC)	https://www.t1g.com/project/medic-specialty-courses/
All	Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	https://www.t1g.com/project/medic-specialty-courses/
All	Basic Combat Trauma Training (BCTT)	https://www.t1g.com/project/operator-level-courses/

All (Army, Navy, Air Force, Marine)	Advanced Tactical Practitioner (ATP)	atp@socom.mil
Civilian	Certified Flight Registered Nurse (CFRN) Review Course	http://www.bcencertifications.org/Get-Certified/CFRN.aspx

Civilian	Critical Care Emergency Medical Transport Program (CCEMTP)	http://ehspace.umbc.edu OR http://www.augusta.edu/mcg/em/com/ccempt.php OR http://www.centerem.org/courseseducation/ccemtp
Civilian	Advanced Hazmat Life Support (AHLS)	https://www.ahls.org/ahls/ecs/courses/courses.html

All	Intro to Prolonged Field Care	https://prolongedfieldcare.org/2016/07/09/prolonged-field-care-classes-for-68ws/ https://drive.google.com/folderview?id=0B7OAVQuGtbzAdVRhMDdKdzBsQWc&usp=sharing
Air Force	Sustainment of Trauma and Resuscitation Program (STARS-P)	AFI41-106 document
Air Force	Expeditionary Medical Readiness Course (EMRC)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf
Air Force	Expeditionary Medical Support (EMEDS)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.7/afttp3-42.7.pdf

Air Force	Aeromedical Evacuation and Patient Staging Course (AEPSC)	AFI 41-106 document http://static.e-publishing.af.mil/production/1/af_sg/publication/afi44-165/afi44-165.pdf

Course Content
Enroute Combat Casualty Care, Rotary Wing Transport (CASEVAC), End Points of Resuscitation/Shock, Initial Properties in the Trauma Patient, Blood and Blood Component Administration, Thoracic Trauma, Abdominal Trauma, Head Trauma/Spine and Spinal Cord Injury, ARDC/Ventilator Lab, ACLS Updates, Sedation/Analgesia/Paralytics, Aeromedical Evacuation System, Aricraft Overview, Stresses of Flight, Infection Control, CRM, Aeromedical Evacuation Documentation, Flight Line Safety/Life Support, Thermal Injury/Burns, Extremity Trauma/Pelvic Fractures/External Fixation, Trauma in Special Populations, Acute Coronary Syndrome
Initial Priorities in the TCCET Patient, Tactical Critical Care Course, Difficult Airway Management, Documentation, Canine Care, Patient Movement Equipment Items, TCCET Rodeo, Planning/Static Execution Adult Simulator, TCCET Mission Planning/Patient Preparation Field Exercise, Mission Planning/Patient Preparation/Tricks of the Trade, Patient Preparation/Flight
Doctrine(CCAT and Aeromedical, Concepts, EMEDS, AE Primer), Altitude Physiology (Stresses of Flight, Chamber Rides), Clinical (Patient Flight Physiology, Acute Respiratory Failure, Mechanical Ventilation, Hemodynamic Monitoring, Burn Management, Clinical Issues), Operational (Allowance Standars/CCAT Team Bags, Transport Pharmacology, CRM, Eqpmt Approval, Flight Line Safety, Aircraft Familiarization, O2 Theramy/Systms, Hands-on Equipment Training, Litter Loading, Infection Control, Mission Managment and Documentation, Field Contigency Exercises)

Tourniquets/wound packing, junctional tourniquets, hypothermia prevention, patient transportation, pain management, JTS CPGs, infection control, damage control resuscitation, fresh whole blood, frozen blood, acoustic trauma, ocular trauma, UXO management, military working dog management, management of severe head injury, catastrophic care, TCCC cards, JTTS forms, radiology, REBOA, prevention of VAP, TeamSTEPPS, trauma teamwork system, trauma triage, medical decision making under stress, trauma/disaster orthopedic concepts (splint, traction splints, pelvic binders), airway management, chest trauma (surgical airway, needle decompression, chest seals, chest tubes), physiologic access, advanced thermal infusers/IV pumps, advanced anesthesia concepts, burr hole/craniotomy, lateral canthotomy, infection control, ET intubation, tib/hum/sternal IO
C4 prepares tri-service medical officers with the knowledge critical in conducting Role I & II healthcare operations in an austere, combat environment. C4 provides training in leadership skills, field medical knowledge and the practical information needed for direct medical support of tactical units under combat conditions. Progressing through the phases of TCCC from care under fire, tactical field and tactical evacuation care, through the echelons of care from point-of-injury to Role II scenarioes. Lanes are simulating mission-oriented medical scenarioes of Village Stability Operations (VSO), Mass Casualty (MASCAL) events, Military Operations on Urban Terrain (MOUT), Tactical Medical Lane (obstacle course), Tactical Evacuation Lane, and a simulated Role II facility utilizing simulator technology. Students encounter combat scenarios in varying roles of leadership and team organization, and participate in the planning, rehearsals, and execution of the medical mission.

Clinical Practice Guidelines,JTTS, Mass Casualty/Triage, War Wounds, Enroute Care, Pediatric Trauma, Spinal Injury Management, Combat Extremity Fracture Management, Vascular Injuries, Pelvic Injuries, Amputations, DCR, Abdominal Injuries, Thoracic Injuries, Head Injuries/Trauma, Shock and Resuscitation, Face and Neck Injuries, Ocular Injuries, Field Critical Care, Soft Tissue Debridement, Human Cadaver Lab, Animal Salvage Lab

Military advanced trauma training, PTSD andTBI awareness/identification/treatment, New provider and renewal certification options for BLS, ACLS, PALS, ABLS, ATLS, ITLS, ADLS, BDLS, TNCC, CCEMTP, AHLS, Cadaver lab, live tissue lab, skills admistration and testing, combat trauma lane, ambulance ride along and level 1 trauma experience
The objective of the course is to give a thorough foundation in the art and science of Retrieval and Transport Medicine. Taught by experts in aviation physiology aerospace medicine, retrieval medicine, intensive care, emergency medicine and pre-hospital care. Addressing relevant issues of the special physical, physiological and psychological stresses that are important in various transport environments, and describes the conditions which are susceptible during transfers by land and air.
The student receives training in veterinary, dental, laboratory, medical diseases and case studies, nursing, initial and long-term wound care, Unconventional Warfare hospital, surgical procedures, pre-anesthesia, anesthesia, post anesthesia care, nursing care, records and reports, radiology, and central materials supply.

The course includes didactic instruction in casualty care at level III facilities, triage, primary and secondary survey of combat causalities, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat wound management, antibiotics and pain control in the combat environment, and combat fluid maintenance. Practical exercises for providers are conducted in airway management, surgical treatment of extremity trauma, chest, abdominal, head, neck and thermal wounds, and pain management/anesthesia delivery mechanisms. Practical exercises for nurses are conducted in airway management, ventilator management, chest tube management, intra-cranial pressure monitoring, central line management, methods of hemorrhage control, nursing management of compartment syndrome, and preparation of casualties for aeromedical evacuation.

Contains the foundation of all trauma training programs focused on treating the casualty, preventing further injuries and completing the mission.
Airway, drags and carries, hemostatic dressings (Celox gauze, chito gauze, combat gauze), limb tourniquets, peripheral pulses
Combat Application Tourniquet, nasopharyngeal airway, cric-key, needle decompression, ruggedized field IV, intraosseous infusion (FAST1). Supplementary modules: celox gauze, chito gauze, combat gauze, CRoC, JETT, SJT (SAM junctional TQ), SOFTT.

The course covers topics designed to decrease preventable death in the tactical situation, including: hemorrhage control, surgical airway control and needle decompression, strategies for treating wounded responders in threatening environments, caring for pediatric patients, and techniques for dragging and carrying victims to safety
Aeromedical rotor wing doctrine, transport equipment and packaging, advanced trauma and critical care management, combined skill aeromedical scenarios, UH60 and CH47 familiarization.
The FMC course provides selected medical enlisted personnel with the knowledge and skills required to conduct pre-Medical Evacuation (MEDEVAC) treatment, load/unload patients in MEDEVAC aircraft and stabilize/treat patients in flight. Soldiers will also have the capability to identify and utilize various MEDEVAC aircraft systems and Medical Equipment Sets, high performance hoist operations and in-flight crew duties as a non-rated crewmember, and perform aircraft radio communication.

Course Goals: The evaluation, resuscitation and management of the wounded soldier present a unique challenge to the medical provider. The modern battlefield and advancements in technology have changed our way of thinking in the approach to combat casualty management. Through “lessons learned” we have found that traditional ATLS/BTLS formats are not applicable to the combat casualty. This course will provide information on how to apply known concepts in trauma to the combat casualty in the combat environment. This course will emphasize the following concepts: 1. Initial Assessment of the combat casualty 2. Initial resuscitation and stabilization 3. Management of specific combat injuries 4. Emergency surgical procedures 5. Post resuscitation management Students will train on the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of injury, triage, primary and secondary survey of combat casualties, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat extremity trauma, antibiotics and pain control in the combat environment, splinting and dressing workshop, and combat fluid

Didactic presentations on initial assessment, airway management, abdominal trauma, thoracic trauma, shock, head and spinal cord trauma, pediatric trauma, trauma in pregnancy, and stabilization and transportation.
Course objectives: Evaluate a patient with a serious burn Define the magnitude and severity of the injury Identify and establish priorities of treatment Manage the airway and support ventilation Initiate and monitor fluid resuscitation Apply correct methods of physiological monitoring Determine which patients should be transferred to a burn center Organize and conduct the inter-hospital transfer of a seriously injured burn patient.
Provides an opportunity for soldiers selected as Brigade Combat Team (BCT) units and the Flight Medic of Army MedEvac crews to acquire the technical and tactical skills needed to function as squad size trauma teams: A. Prepare unit and subordinate elements for peace and wartime missions and contingencies. B. Plan and execute tasks and missions assigned to squad size elements. The Brigade Combat Trauma Team Training (BCT3) course incorporates Tactical Combat Casualty Care (TC-3), emergency medical treatment and evacuation in a variety of operational combat settings from point of injury through to echelon III of the military health care system. The course is based upon the injury patterns of combat casualties and the constraints to deliver medical care on the battlefield and in urban warfare.

We will introduce, emphasize, and reinforce Tactical Combat Casualty Care principles, patient assessment and treatment, and the importance of adaptability, improvisation, innovation, self-reliance, and self- sufficiency. The NCO will be introduced to the role of medical advisor to US and Coalition Leadership on all health care matters.
Surgical exposures in neck, chest, abdomen/pelvis, and upper/lower extremities
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone

Prioritize assessment needs for the criticaly ill or injured infant and child Select appropriate diagnostic tests Identify and respond to significant changes in the unstable pediatric patient Recognize and initiate management of acute life-threatening conditions Determine the need for expert consultation and/or patient transfer and prepare for optimal transfer
1. Examine the planning factors and elements related to joint, coalition, and USG interagency medical planning, and DoD support to civil authorities. 2. Support the joint medical planning community in the development of the systems analysis, operational risk assessment, and field medical services planning. 3. Discuss HSS operations in the Joint Operations Area. 4. Categorize DoD and USG interagency deployable Health Service Support (HSS) capabilities. 5. Summarize the military medical continuum of care to include the patient movement system. 6. Identify resources and processes that are available to Medical Planners and Action Officers. 7. Demonstrate Joint Operational and Health Service Support Planning.

This course was developed by a multidisciplinary faculty assembled from individuals with experience in humanitarian operations and expertise in infectious disease, management of dehydration, malnutrition, preventive medicine and health education. The instructional strategy relies heavily on interactive processes (scenario exercises and case management based skill stations). The scenarios and cases are all derived from real operational experiences of instructors and allow students to problem solve and face ethical dilemmas in triage and develop creative logistical and clinical solutions. In class instruction parallels this manual which contains complete diagnostic and treatment algorithms for the targeted clinical conditions and has been derived from publications of international public health authorities. The course culminates in a round robin of "skill stations" in which students must demonstrate their ability to manage a field clinical scenario in each major category: Dehydration, Malnutrition, and Infections. In addition students must complete a comprehensive written exam.

Basic: This course provides an overview of the different types of Chemical, Biological, Radiological, Nuclear, or high-yield explosives (CBRN) threats, information on how to prepare for and recognize a CBRNE threat, and instructions on the protective measures. It also explains disaster management and the actions it take to prepare for, respond to and recover from an all-hazards incident. Short: Refresher/Sustainment course is designed to prepare personnel to effectively respond to an all-hazards incident including those emanating from chemical, biological, radiological, nuclear, or high-yield explosives (CBRNE) sources. This course also explains the current global threat of CBRNE use, the characteristics and effects of threat agents, principles of personal protection, agent detection, recognition and emergency treatment of agent exposure, and the principles of triage and decontamination of CBRNE agent casualties. Executive: This is provides an overview of the National Incident Command System, National Response Framework, and the response from at the local, State, and National levels during an all-hazards incident. It describes how DSCA fits into the missions of homeland security (HLS) and homeland Defense (HLD) and describes how DoD supports HLS and HLD missions to provide civil support.

NCMR develps and delivers custom exercises for any organization in order to meet their unique requirements. The exercises conform to Homeland Security Exercise & Evaluation Program standards, and the NCMR team assists with exercise program management, design and development, conduct, evalation and improvement planning. They also offer discussion-based exercises (seminars, workshops, tabletop exercises and games) which focus on strategic, policy-oriented issues.
Systematic, concise approach to the care of a trauma patient; the course teaches a safe, reliable method for immediate management of injured patients including assessment techniques, resuscitation, stabilization and severity prioritization for possible facility transfer, while ensuring the provision of optimal care

Teaches proper operative technique for dealing with trauma injury, increasing self-efficacy in management of traumatic injuries, increasing knowledge in management of penetrating injuries, gaining the ability to successfully and safely perform all operative procedures presented in the course
The course is based on the concept that in most situations, rural facilities can form a trauma team consisting of at least three core members; the purpose of the course is to provide leadership and advocacy for rural trauma/surgical issues and the rural trauma patient. The objectives of the course include defining roles and responsibilities for team members, facility preparation, identification of local resources and limitations, patient assessment and resuscitation, early initiation of the transfer process, establishment of a performance improvement process, effective communication skills, and defining the relationship between the rural trauma facility and regional trauma system.

Epidemiology and history of disasters, disaster planning, disaster response organization and execution, medical management of mass casualties, pathophysiology and patterns of injury, postdisaster assessment and recovery, pitfalls and barriers in disaster planning and response, understanding the needs of special populations (pediatric, geriatric, disabled).
Course objectives include:explaining the shift from individual to population-based care in a disaster or public health emergency, practice mass casualty triage in a simulated disaster scenario, choose strategies to establish organizational and community surge capacity in a disaster or public health emergency, differentiate roles performed in an emergency operations center or incident command center established in response to a simulated mass casualty event, discuss legal, regulatory, and ethical principles and practices to enable health professionals to provide crisis standards of care in a disaster or pubic health emergency, select personal protective equipment and decontamination measures appropriate for personnel and public health protection in a disaster or public health emergency, and apply clinical skills for the management of mass casualties in simulated all-hazards scenarios

The course content consists of core topics with additional topics that can be added per the instructor's decision. The main topics include pediatric assessment, pediatric airway in health and disease, shock, cardiovascular and central nervous systems, trauma, child maltreatment, nontraumatic surgical and orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia and children with special health care needs. The course has an optional PALS informational offering. Many of the topics covered are among the requirements for residency education in pediatrics, including: acute episodia medical illnesses (meningitis, sepsis, dehydration, pneumonia, diarrhea, renal failure, seizure, coma, hypotension, hypertension, respiratory illness), problems associated with chronic disease (diabetic ketoacidosis, status asthmaticus, status epilepticus, congenital heart disease, cystic fibrosis, gastrointestinal, metabolic and neurologic disorders). The manual outlines step-by-step over 90 procedures - these can be presented as skill stations by the instructor and include endotracheal intubation, placement of I/O and IV lines, umbilical artery and vein catheter placement, thoracic procedures, surgical airway techniques, wound care, suturing, splinting and casting
The course objectives including providing a practical foundation in Wilderness Medicine for medical professionals, teaching patient assessment and treatment guidelines for life support until defnitive care or evacuation is available, training providers the methods for managing medical and traumatic emergencies and urgencies in the wilderness when evacuation is unavailable or unnecessary, and teaching techniques and guidelines for evacuation

Course participants will be able to describe the following upon completion of the course: an all-hazard, standardized, scalable casualty management approach for use in disasters and public health emergencies, including life-saving interventions and medical decision making in an altered care environment; information sharing, resource access, communication, and reporting methods useful for health professionals during disasters and public health emergencies; the purpose and importance of the incident management system for providing health and medical support services in a disaster or public health emergency; field, facility, community and regional surge capacity assets for the management and support of mass casualties in a disaster or public health emergency; considerations and solutions to ensure continuity of and access to health-related information and services to meet the medical and mental health needs of all ages, populations, and committees affected by a disaster or public health emergency; public health interventions appropriate for all ages, populations and communities affected by a disaster or public health emergency; identification of potential casualty populations in a disaster or public health emergency, including persons with acute injuries or illnesses, those with pre-existing disease, injuries or disabilities, and those with age-related vulnerabilities and other functional and access needs, including their family/caregiver support network; deployment readiness components for health professionals in a disaster or public health emergency; all-hazards standardized, scalable workforce protection approach for use in disasters and public health emergencies, including detection, safety, security,
Course focuses on pediatric assessment, airway skills, spinal stabilization, vascular access, children with special healthcare needs, respiratory emergencies, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions

Course focuses on pediatric assessment, airway skills, spinal stabilization, children with special healthcare needs, respiratory, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions
Course objectives focus on the following topics: all-hazards approach to disaster mitigation, preparedness, response and recovery; essential components of federal, state, regional, and community disaster health systems, including the role of public and private health sectors; elements of the PRE-DISASTER paradigm and their application to the management of disasters and public health emergencies; actions that can be taken to enhance personal preparedness and resilience for disasters and public health emergencies; legal and ethical issues that impact disaster mitigation, preparedness, response, and recovery, including the basic legal framework for public health; the elements of the DISASTER paradigm and their application for the management of disasters and public health emergencies
The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma

The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma
The didactic portion of the course includes: assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices
The didactic portion of the course includes: the tools to do the job, size-up, call for help and set-up, vehicle stabilization, accessing, stabilizing the victim, disentanglement, packaging and transfer. The course uses actual wrecked cares for skill practice, as the majority of the content is focused on practical skills.

The didactic portion of the course includes: scene size-up, assessment and initial management of the trauma patient, airway management, shock evaluation and management, thoracoabdominal trauma, head, spinal and extremity trauma, blast injury, burns, special populations (pregnant, pediatric, geriatric), special situations (intoxication and trauma arrest)
The course content includes: 1-rescuer child CPR and AED use, 1- and 2-rescuer infant CPR, management of respiratory emergencies, rhythm disturbances and electrical therapy, vascular access, resuscitation team concept, cardiac, respiratory and shock case discussions and simulations, systematic approach to pediatric assessment
The course provides a safe environment to practice trauma assessment and treatment skills while teaching valuable critical thinking skills that positively influence decision making. Topics covered include scene assessment, primary patient assessment, airway-breathing-circulation-disability, secondary survey/reassessment, team approach, communication skills, potential pitfalls, airway anatomy, procedures, adjuncts and injuries for adult and pediatric patients, breathing, ventilation and oxygenation support and treatment, circulation, hemorrhage control and shock (including anatomy, metabolism, pathophysiology, mechanisms and assessment of shock when there is no clear cause), CNS trauma, brain and spinal cord injuries and management, special considerations and unique aspects of pediatric, geriatric and multiple patients

The course focuses on procedures and technologies that are most appropriate for extreme environments and extended-care context, providing well-rounded exposure to the challenge of providing advanced medical care in a difficult environment. A large portion of the course is devoted to hands-on training and general principles of wilderness and rescue medicine, and a significant amount of time is spent outdoors. Pre-course study guides are mailed 2-4 weeks before the course, and participants take an on-line pretest and complete case study assignments prior to the beginning of the course. Skill labs include basic and advanced airway techniques and equipment, cardiovascular emergencies and wound management. Moulage and simulation scenarios are utilized during hands-on instruction.
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure
The course is focuses on professional medical practitioners and teaches them to build on a background in urban emergency care and learn how to improvise equipment, deal with challenging environmental conditions and make difficult medical decisions in remote locations

The course is influenced by weather, terrain and the characteristics of the individuals involved, and are thus not fully scripted. Given the variables, the depth of topic coverage may vary.
Course educates participants on immobilization and carrying techniques, litter packaging cold and heat emergencies, joint reductions, fracture management, spinal injury assessment and management, eye injuries, dental emergencies, expedition health and hygiene, psychological emergencies, tropical medicine, altitude illness, envenomation, evacuations, rescue considerations, mass casualty incidents, triage situations, how to utilize medical kits and manage remote site clinics

This course refreshes all REMT curriculum, including high-level medical skills and topics that include advanced wound closure (suturing), Foley catheterization, antibiotic therapy, IV administration, sick call and primary care, pediatrics, geriatrics, and childbirth. Additionally, the course covers travel medicine, telemedicine, medical kit integration, lifting and moving patients, advanced airway management, oxygen administration, shock, thoracic trauma, head injuries, dental emergencies, musculoskeletal injuries, respiratory and cardiac emergencies, mass-casualty incidents, anaphylaxis, cold and heat emergencies, altitude, immersion, and submersion among others.
The course reviews the difference between high-risk and convential medicine, the top causes of preventable death in high-risk scenarios, how to properly identify and treat life threatening injuries, high-threat extraction techniques, and what to do during mass casualty incidents. The course also covers wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries
This two-day provider course provides CALS core curriculum and serves as the foundation for all of its learning opportunities, presented on-site in rural or remote hospitals, offering interactive sessions in cardiac, traumatic, pediatric, obstetrical, neonatal and medical advanced life support; team attendance is encouraged; the course expects demonstration of the ability to problem solve in a variety of clinical situations, identification of key threats and demonstration of therapeutic interventions, discussion of the roles of each team member involved in patient evaluation and treatment, and performance of skills consistent with the provider's role on the advanced life support team

The SOCM student will be proficient in the following areas/objectives upon completing the course. Basic Life Support (BLS) -certifies students through the American Heart Association (AHA) approved curriculum; Emergency Medical Technician - prepares students to sit for the National Registry for Emergency Medical Technician (NREMT) exam and culminates with NREMT certification; Medical Math -instructs how to prepare, calculate, and administer medications; Anatomy and Physiology -instructs the structures and functions of the 11 organ systems and how to identify the anatomical structures and their functions on cadavers in the laboratory; Physical Examination -instructs patient interaction, history taking, physical examination techniques, clinical decision making, and documentation and introduces students to radiology and laboratory procedures; Clinical Medicine- instructs pathophysiology, pharmacology, preventive medicine and medical management of weapons of mass destruction; Dental - instructs the basic emergency dental care in an austere environment; Advanced Cardiac Life Support (ACLS) - certifies students in ACLS through the AHA approved curriculum; Pediatric Education for Prehospital Professionals (PEPP) -certifies students in PEPP through the approved PEPP curriculum; Military Medicine -instructs medical planning in support of tactical operations, preventive medicine and weapons of mass destruction; Trauma -instructs pathophysiology, assessment, and management of traumatic injuries; Advanced Trauma Practical Skills -instructs intravenous and intraosseous access, endotracheal intubation, needle decompression, tourniquet application, nasogastric

The course provide training in Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; patient management skills; pre-hospital trauma emergencies and care; tactical combat casualty care skills; operating room procedures; minor surgical skills; NREMT-Basic examination; obstetrics/gynecology and pediatric emergencies; cardiac pharmacology; Advanced Cardiac Life Support (ACLS); EMT Paramedic clinical rotation and field internship consists of a 2-week hospital rotation in the emergency department, labor and delivery, surgical intensive care, pediatric emergency department, operating room, and a 2-week ambulance rotation with an assignment to an Advanced Life Support EMS unit responsible for responding to a variety of 911 emergency calls; USSOCOM EMT-Paramedic exam; care of the trauma patient in a field environment; preventive medicine; Nuclear, Biological and Chemical (NBC) casualty care, and nursing care; 30 hours of clinical rotations in clinics located on Fort Bragg, NC, conducting sick call under the supervision of a physician or physician's assistant.
Environmental emergencies (altitude, heat, snake bite, insect bite, cold injury), airway management, physical therapy evaluation, pharmacology, shock, thoracic trauma, airway oxygenation and ventilation, TBI, thermal trauma, crush injury, austere planning and evacuation, mass casualty management, field blood transfusion, patient movement techniques, animal care, medical emergencies in canines, shearing and aid bag packing, trauma skills (airway, patient assessment, surgical cric, intubation, TCCC, wound dressing, tourniquet, orthopedic injuries/splints, IV, hypovolemic shock, triage, control bleeding, NCD, neurological exam, vital signs, manage burns, cardiac arrest/ECG)

Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; prehospital trauma emergencies; patient management tasks/skills; advanced trauma skills; operating room procedures; minor surgical skills; obstetric and pediatric emergencies; crdiac pharmacology; Advanced Cardiac Life Support (ACLS), clinical/ambulance rotation; extended care to the trauma patient in a field environment; mass casualty; military triage system; medical mission planning; medical threat; preventive medicine; physical examination; veterinary; dental laboratory; medical diseases and case studies; nursing; initial and long-term wound care; echelons of care (EOC) including training in combat trauma management, UW hospital, surgical procedures, preanesthesia, anesthesia, postanesthesia care, nursing care, records and reports, radiology, and central materials supply; attends a special operations clinical training site (30 days at a U.S. Army medical training facility within CONUS) including clinical training/experience and evaluation on ability to apply patient assemssment/management/care skills in various clinical settings; rotations through surgery, dermatology, pediatrics, orthopedics, radiology, preventive medicine/community health, and the outpatient/family practice clinic.
The course content consists of Civil Information Management, Medical Information and Intelligence, Civil Medical Engagements, Civil Reconnaissance, Occupational and Environmental Assessments, Arthropod-borne Disease Risk Management, Host Nation Food and Water Risk Management, and Veterinary and Agricultural Studies.

The course will familiarize attendees with the US SOCOM Mission, roles and capabilities with focus on medical operations in the joint SOF setting. Areas of emphasis will include operations/plans, current lessons learned, intelligence, medical force protection, operational risk assessment, health surveillance and SOF relevant clinical subjects.
Learning objectives: Describe NATO Medical Command and Control structures: Given a scenario, students from different nations and cultures will be able to describe NATO command, control, and force structures in accordance with current practices. Comprehend NATO Comprehensive operational planning process and medical support: Given a scenario, students will explain terms and procedures used to support the NATO comprehensive operational planning process (COPD & OPP) and multinational medical support planning. Understand NATO Medical Doctrine: Given a scenario, students will describe the different levels and content of medical support doctrine and policies. Synthesize NATO Operational Medical Planning Process: Given scenarios, students will develop a medical support plan IAW references that details the required components of a medical support plan within military, humanitarian, and joint multinational operations. Apply Multinational aspects of Medical Support applications: Given scenarios, students will develop a Medical ConOps IAW with references that outline key considerations for joint multinational medical support planning within military, humanitarian, and joint operations.

Students will receive both didactic and clinical training required for application and testing as an NREMT-Paramedic.
This course consists of 2-weeks of class room didactics in critical care medicine and path physiology, key elements of enroute critical care, and 6-weeks of in hospital practical experience, ground, and air ambulance observation with San Antonio EMS, and air ambulance observation with local providers of this care.
Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of combat chest wounds, and lifesaving emergency surgical skills on high fidelity simulation manikins. Students will conduct scenarios in both clinical environment and high fidelity aircraft environment. All scenarios and exercises will refresh critical care knowledge and provide recertification for the NRP.

Phase 1 (9 weeks 1 day) didactic study includes: basic anatomy and physiology; vital signs, cardiopulmonary resuscitation; principles and methods of decontamination, sterilization and disinfection; storage and handling of sterile supplies; identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metalware; duties of the scrub and circulating technician; principles and practices of sterile technique and standard precautions; transporting and positioning patients; operating room safety; handling of specimens, medications, dyes and hemostatic agents; and surgical specialties as they relate to selected surgical procedures. An FTX is also incorporated into the course. Phase 2 (10 weeks) is on-the-job training in the clinical environment. Total course length: 19 weeks 1 day
Supervised OJT focuses on the principles of surgical technology practice, and the instruments, supplies, and equipment for surgical procedures. Clinical study and practicum includes anatomy and physiology, vital signs, cardiopulmonary resuscitation, principles and methods of sterilization and disinfection, storage and handling of sterile supplies, identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metal ware, duties of the scrub and circulating technician, principles and practices of sterile technique and standard precautions, transporting and positioning patients, operating room safety, handling of specimens, medications, dyes and hemostatic agents, and surgical specialties as they relate to selected surgical procedures.
The consolidated curriculum will include didactic critical care nursing theory, patient movement, and operational environment training, followed by 9-weeks of clinical tracks in medical and surgical intensive care units and the emergency department training at San Antonio Military Medical Center (SAMMC) focusing in specialty area
The consolidated curriculum will include emergency/trauma and critical care theory, patient movement, and operational environment training followed by 9-weeks of clinical tracks in the emergency department and medical and surgical intensive care units focusing in specialty area.

Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support
Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support.The program stresses following review of problems and complications in exodontia and oral surgery; the emergency treatment, evacuation, and definitive care of patients with traumatic injuries of the maxillae, mandible, and facial bones associated with the dental arches; diagnostic procedures, anesthesia and extraoral roentgenographic techniques for oral surgery; differential diagnosis of infections of the mouth, head, and neck; dentoalveolar surgery, control of hemorrhage, diagnosis and treatment of shock, tracheotomy; and management of maxillary sinus complications associated with oral surgery procedures. The pathology and treatment of oral keratoses, odontogenic cysts and tumors as well as the role of the dentist in the management of benign and malignant oral lesions is discussed. Principles and trends in antibiotic and chemotherapy receive considerable attention.

Phase 1 didactics last approximately 16 months. During this time, students are exposed to the basic medical sciences and progress into clinical medicine courses that help them understand critical medical concepts and application of those concepts in patient scenarios. Phase 2 training lasts approximately 13 months (including hospital orientation and mandatory facility training). During that time, students rotate through a variety of clinics in order to gain clinical knowledge and experience.

Advanced mechanical ventilation, emergency burn evaluation and care, emergency neck and chest trauma, emergency pediatric trauma, emergency pregnancy related injuries, emergency shock evaluation and treatment, emergency stabilization and trainsfer, emergency trauma assessment, head trauma, pediatric heat and cold submersion, transport nursing safety and survival, trauma in the elderly, trauma of the muscular and skeletal systems, trauma to the abdomen, traumatic submersion injuries

Pathophysiology, pharmacology, 12-lead ECG interpretation, interpretation of lab values, interpretation of routine diagnostic images, ventilator management, aortic balloon pump management, and air medical concepts
Epidemiology of hazardous materials, toxic inhalations, pesticide poisoning, corrosives, hydrocarbons, halogenated hydrocarbons, miscellaneous toxicants, toxic terroism (chemical, biological, radiological and nuclear incidents); by completion of the course, participants will be able to rapidly assess hazmat patients, recognize toxic syndromes (toxidromes), discuss the medical management of hazmat patients, apply the poisoning paradigm, and identify and recognize appropriate administration of specific antidotes

Discusses the differences between typical TCCC and PFC, with a focus on certain interventions that vary between TCCC and PFC: patient monitoring, resuscitation, ventilation, definitive airway control, pain control, exam and diagnostics, nursing/hygiene/comfort, advanced surgical measures, telemedicine consult, and preparing for transport. The objectives are to increase 68W Medic education and awareness of common medical/trauma issues that require further training than what is taught in AIT, establish a base in common nursing skills, and assist caring for patients; often when a provider is not available.
LOAC, code of conduct, AFMS mission, C3i, vehicle/aircraft patient loading, litter carries

Course Breakout	Altered Mental Status	Airway Mgt	Breathing
Deployment Adminstration (8hrs), Core Content (25.5hrs), Skill Training(7hrs), Operational Training(17.5hrs), Corps Specific Training(45hrs for each discipline, ie physicians, nurses, respiratory therapists)			
Deployment Administration (5hrs), Core Content (12.5hrs), Skills Training(5.5hrs), Operational Training(17hrs)		X	
			X
Doctrine (hrs), Altitude Physiology (hrs), Clinical (hrs), Operational (hrs)		X	X

Phase I: 5 day didactic and simulation training, focus on TCCC topics and CPGs, providers attend the Advanced Surgical Skills for Exposure in Trauma course and the Combat Extremity Surgery Course. Uses a 5-person team approach, with TeamSTEPPS. Concludes with intensive situational training exercise. Phase II: Clinical rotation schedule. Members rotate through trauma resuscitation unit and operating room and trauma intensive care unit, using TeamSTEPPS and the 5-person team approach. Phase III: Capstone Exercise, trainees assume control of the trauma resucitation unit, observation area, and trauma operating room at Ryder for a set period of continuous operations. FST members manage all patients who arrive at the trauma center. Train on live patients.	X	X	X
Day1: Processing, Day 2-4:Specific trauma certificaiton courses (ATLS, PHTLS, TNCC), Day 4-6: TC3, Village Stability Operations, MASCAL lane, Tactical Medicine Movement Course, Military Operations on Urban Terrain VIRTRA simulation, Role 2 simulation, TACEVAC UH60 Simulation, PFC, Medical Leadership, Day 7: PFC training exercise (FTX), Day 8: CBRNE training	X	X	X

Initial Assessment and Mangement, Airway and Ventilatory Management, Shock, Thoracic Trauma, Abdominal Trauma, Skills Stations, Surgical Skills, Head Trauma, Spine and Spinal Cord Trauma, Musculoskeltal Trauma, Cold/heat Injuries, Extreme ages, Trauma in women, Transfer to definitive care, Austere Environement	X	X	
Kinematics of Trauma, Patient Assessment, Airway Management, Shock and Fluid Replacement, Spine Trauma, Pediatric Trauma, Thoracic Trauma, Abdominal Trauma/Trauma in Pregnancy, Head Trauma, Musculoskeltal Trauma, Thermal Trauma		X	
Trauma Nursing Core Course and Trauma Nursing, Biomechanis and MOI, Initial Assessment, Shock, Brain and Cranial-facial Trauma, Thoracic and Neck Trauma, Geriatric Trauma, Abdominal Trauma, Spinal Cord and Vertbral Column Trauma, Musculoskeletal Trauma, Burn Trauma, Trauma and Pregnancy, Pediatric Trauma, Psychosocial Aspect of Trauma Care, Stabilization, Transfer and Transport, Battlefield Triage, Battlefield Wounds	X		
Didactic(20hs), Cadaver Lab (6.5hrs), LT Lab (2.5hrs)			

Module 1: ITLS Assessment Skills Training and Testing, Module 2: BDLS, Module 3: Combat Sressor Awareness/TBI, Module 4: Cadaver Lab, Module 5: LT Laboratory, Module 6: Combat Trauma Lanes/MASCAL Exercise, Simulation Lab, Ambulance Ride-along, Module 8: Level 1 Trauma Rotation		X	X
2 days of extreme physiology (Transport physiology, Biodynamics, Environmental extremes). 2 days of clinical aspects of retrieval medicine (Pathophysiology, Clinical concerns, Transportable medcial equipment). 2 days of logistic & command issues in medical transport (Organisation, Medicolegal issues, Standards and safety).			
Laboratory (3 weeks), Medicine (5 weeks), Surgey/Anesthesia/Nusing (4 weeks), Dental (1 weeks), Spec Ops Clinical Training (4 weeks), Gurerilla Hospital Methods (I weeks), Veteniary (2 weeks)			
JTTS, Clinical Practice Guidelines, Initial Triage and Assessment, Neurotrauma, Ocular Trauma, Neck Injuries, Traumatic and Difficult Airway, Thoracic Trauma, Spinal Trauma, Abdominal Pelvic Trauma, Perineal Trauma, Orthopedic Trauma, Traumatic Amputations, DCR and Blood Products, Pediatric Trauma, Patient Handling, Disposition of Remains, Medical Ethics, Battlefield Afghanistan and Current Injury Patterns, Psychosocial Aspects, Wounded Warrior Panel Discussion, Mild TBI, TMIP	X	X	

Breakouts for specific subspecialties include: orthopedic, general surgery, emergency medicine, anesthesia, nursing, etc.		X	X

1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care 4. Tactical Evacuation Care 5. Scenarios for TCCC		X	
1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care #1 4. Tactical Field Care #2 5. Tactical Field Care #3 6. Tactical Evacuation Care 7. Direct from the Battlefield		X	X

Phase 1: Direct Threat Care (emphasis on mitigating the threat, moving the wounded to an area of relative safety, managing massive hemorrhage, rapid positional airway management if feasible), Phase 2: Indirect Threat Care (once casualty is in an area of relative safety, assessment and treatment priorities focus on preventable causes of death - major hemorrhage, airway, breathing/respirations, circulation, head and hypothermia, and everything else (MARCHE)), Phase 3:Evacuation care (moving the casualty toward a defnitive treatment facility while performing reassessment of interventions and hypothermia management)		X	X
Phase I: Mandatory distance learning modules covering Aeromedical and Aviation specific content areas. Phase II: 12 day residence course with additional didactic content and extensive hands-on practical exercises, culminating with comprehensive written exam and graded practical exams on equipment and Critical Care Transport simulation.		X	
Phase I: Distributed Learning phase available thru BlackBoard. Covers 63 hours of medical and aeromedical subjects relevant to performing tasks required by a flight medic in the follow-on training during Phase II. Phase II: covers knowledge and skills in the areas of ACLS, Flight Medic Pharmacology, Drug Dosage Calculations, ITLS, PEPP, critical care management of a patient in a medical evacuation aircraft platform, Rapid Sequence Induction, Helicopter Underwater Egress Training, High Altitude Chamber, Personal Recover Operations, Survival Training, Canine Trauma Management.			

Rotation: 16 days. Day 1-4 in Intermediate Staging Base, days 5-16 spent performing the exercise itself. Three operational phases: insertion and counter-insurgency operation, defense in response to attack, and attack into a MOUT complex. Mission Readiness Exericse: 12 days, include legally intense issues associated with a peacekeeping deployment. Exercises attempt to replicate the Collocated Operating Base (COBs) and issues that will be encountered by the unit in the region.			
Each topic presented in PowerPoint format. At the end of the course, students will practice their procedural/emergency surgerical skills in a live tissue lab. Final event is trauma lanes conducted in a field environment that will progress through three phases of care: care under fire, tactical field care, and casevac - the trauma lanes are aimed at tying in all of the information presented throughout the course, will culminate with surgical skill exposure designed to match the trauma lane scenario. Small group AAR after each scenario.	X	X	

Skill stations: Initial assessment and management Airway and ventilatory management Pediatric Trauma Hemorrhagic shock Spine and extremity injuries Head trauma		X	X
Chapter 1: Ch2: Initial assessment and management Ch3: Airway management and smoke inhalation injury Ch4: Shock and fluid resuscitation Ch5: Burn wound management Ch6: Electrical injury Ch7: Chemical burns Ch8: Pediatric burn injuries Ch9: Stabilization, transfer, and transport Ch10: Burn disaster management		X	X
The Health Care Specialist receives specific training in the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of wounding, triage, primary and secondary survey of combat causalities, airway management, extremity trauma, chest trauma, thermal burns, wound management in the combat environment, splinting and dressing. Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of chest wounds, packing of medical treatment bags, life-saving emergency surgical skills, and the evaluation and management of mass causalities utilizing simulated combat casualty scenarios.		X	X

Objectives: Demonstrate knowledge of key anatomical exposures for the care of injured and acutely ill surgical patients Demonstrate technical ability to expose important structures that may require acute surgical intervention to save life or limb Gain confidence in performing anatomic exposures independently Faculty assessment of a student's ability to independently perform anatomical exposures will be satisfactory			
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone			

Chapters: Assessment of critically ill child, airway management, pediatric cardiac arrest, diagnosis and management of the child with acute upper and lower airway disease, mechanical ventilation, diagnosis and management of shock, acute infections, fluids/electrolytes/neuroendocrine metabolic derangements, traumatic injuries in children, pediatric burn injury, nonaccidental injuries diagnosis and management, pediatric emergency preparedness, management of the poisoned child, transport of the critically ill child, neurologic emergencies, management of the child with congential heart disease, oncologic and hematologic emergencies and complications, acute kidney injury, postoperative management, sedation/analgesia/neuromuscular blockade, invasive medical devices		X	

	X		X

Initial assessment and management, airway and ventilatory management (including cricothyroidotomy), shock assessment and management, venous cutdown, thoracic trauma (x-ray identification of thoracic injuries, chest trauma management), abdominal and pelvic trauma (focused assessment sonography in trauma - FAST, diagnostic peritoneal lavage), head and neck trauma assessment and management, x-ray identification of spine injuries, spinal cord injury assessment and management, musculoskeletal trauma assessment and management, thermal injuries, pediatric trauma, geriatric trauma, trauma in pregnancy and intimate partner violence, transfer to definitive care			
	X	X	X

The course consists of a precourse preparation package that includes a CD-ROM outlining objectives and demonstrating surgical repair. Participants are to review exposures dealing with penetrating injuries, with commentary by experts in the field of penetrating trauma management. Participants then complete a precourse multiple choice question examination and self-efficacy test. They are then provided with a manual outlining the injuries and a critique of injury approaches with appropriate references, together with a textbook on managing specific injuries derived from writings by experts in the field of trauma (this textbook describes clinical trauma scenarios with experts' preferred surgical techniques for management of these injuries, complete with full illustrations). On the day of the course, the sessions begin with six lectures: the program's development, trauma laporotomy, liver injuries, injuries to the stomach, duodenum and pancreas, splenic injuries, genitourinary trauma and cardiac and vascular injuries. After the lecture sessions, the participants gown and glove and are introduced into a fully equipped and staffed OR. At this point the trainee-instructor ratio is 1:1. Standardized injuries are created on a live porcine model, the participant is given clinical scenarios, and then tested according to standardized criteria for their			X
Course curriculum objectives include descibing components of state, regional and local trauma system, identifying components of an effective trauma system, describing what is necessary to prepare for local hospital's treatment of the critically injured trauma patient, outlining the components of the primary survey, decision for transfer to definitive care and the secondary survey, demonstration of the concepts of the primary survey, decsion for transfer to defnitive care and secondary survey as applied in simulated injured patient scenarios	X	X	X

Understanding surgical problems, injury patterns and issues that may result from disasters, discussion of the role that surgeons can play in planning for and responding to mass casualty incidents and disasters, especially at a hospital level, familiarization of terms and concepts of incident command, understanding the principles and challenges of disaster triage, familiarization with treatment principles related to blast injury, chemical attacks and radiological dispersal devices, knowing the civilian and military assets available for support			
Training components include population scenarios discussion, mass casualty triage tabletop and situational training exercises, surge tabletop scenario for health care facilities, personal protective equipment skills performance and decontamination review, casualty management in small groups with simulated scenarios and emergency operations center situational training exercise. This course is the application of the knowledge obtained in the CDLS and BDLS courses			

Pediatric assessment, airway procedures, cardiovascular procedures, pediatric specific airway, central nervous system, medical emergencies, cardiovascular system, trauma, non-traumatic surgical emergencies, special needs populations, metabolic diseases, toxicology ingestions and smoke inhalation, child maltreatment; additonal topics can be chosen from the following list: preparedness for pediatric emergencies, environmental emergencies, non-traumatic orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia, interface with EMS, disaster management, preparedness for acts of nuclear, biological and chemical terrorism, medical-legal considerations, mock codes, pediatric emergency radiology, advanced trauma procedures, office emergencies, rapid sequence intubation, advanced airway procedures, advanced trauma procedures, splinting procedures, wound closure procedures	X	X	X
Patient assessment, wilderness wound management, HEENT and dermatology, splinting and dislocations, cervical spine and patient movement, hypothermia wraps and patient packaging, legal issues, medical problems, avalanch, altitude illness (including pulmonary and cerebral edema), hypothermia/frostbite, hyperthermia, water purification and hydration, medical kits, lightening, animal injuries, bites and stings, dive medicine, submersion injuries, infectious disease	X	X	

DISASTER paradigm (Detect, Incident Command, Scene Security and Safety, Assess Hazards, Support, Triage and Treatment, Evaluation, Recovery), natural disasters, traumatic and explosive events, nuclear and radiological events, biological events, chemical events, psychological aspects, public health implications of disasters			
Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, vascular access station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study		X	X

Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study		X	X
Scene size-up, standard precautions, patient assessment and management, trauma in pregnancy, elderly trauma, shock evaluation and management, trauma in children, head trauma, airway management, thoracic trauma, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skills stations: basic airway management, short SMR devices/emergency rescue and rapid extraction, traction splints, helmet management/log roll/long backboard, patient assessment and management	X	X	X

Standard precautions, scene size-up, patient assessment and management, trauma arrest, trauma in pregnancy, elderly trauma, trauma in children, thoracic trauma, head trauma, airway management, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skill stations: basic and advanced airway management, short SMR devices/emergency rescue and rapid extrication, traction splints, helmet management/log roll/long backboard, chest decompression/fluid resuscitation, patient assessment and management	X	X	X
The didactic portion of the course includes; assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices	X	X	X
In addition to the didactic portion, the procedures covered include disarming the supplemental restraint system, stabilizing a vehicle on its wheels, on its roof, on its side and temporarily with improvised materials, opening a door from a hinge or bolt mechanism, removing a roof from back to front, dropping a roof from a vehicle on its side, removing the floor assembly from a vehicle, moving the steering column/wheel, moving the dash/front end, dropping the sides of a wrecked vehicle, lifting a vehicle off a patient trapped underneath, packaging the patient for removal, using a long spine board and straps or rope sling			

In addition to the didactic portion, the skills station session covers patient assessment and management, basic and advanced airway management, spine management: short SMR devices/emergency rescue and rapid extrication, spine management, helmet management/log roll/long backboard, traction splints, chest decompression/fluid resuscitation/hemorrhage control	X	X	X
Recognition and treatment of infants and children ast risk for cardiopulmonary arrest, systematic approach to pediatric resuscitation, effective respiratory management, validation of skills for one-person and two-person CPR and AED skills for infants and childresn, defibrillation and synchronized cardioversion, intraosseous access and fluid bolus administration, effective resuscitation team dynamics		X	X
Course summary includes describing the physiology and kinematics of injury, understanding the need for rapid assessment of the trauma patient, transporting patients to the appropriate medical facility depending on their injuries, advancing the level of knowledge in regard to examination and diagnostic skills, enhancing performance in assessment and treatment of the trauma patient, advancing the level of competence in regard to specific prehospital trauma intervention skills, and establishment of management methods for prehospital care of the multisystem trauma patient	X	X	X

General concepts in wilderness medicine, patient assessment system, critical systems, spine assessment and treatment , musculoskeletal, limb splinting, dislocation reduction demo and practice, skin, soft tissues and burns, thermoregulation, cold injuries, altitude, anaphylaxis, SCUBA, lightening, submersion, ALS treatment, tools and medications, appropriate technology, SAR/organization, expedition practitioner/backcountry medicine, first aid kits, toxins, bites and stings, medical legal		X	X
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure	X		
Patient assessment system, documentation, medical legal, CPR in the wilderness, spinal cord injuries, long-term patient care, chest injuries, shock, head injuries, wilderness wound management, athletic injuries, fracture management and traction splinting, dislocations, cold injuries, heat illness, altitude illness, cardiac, respiratory and neurological emergencies, abdominal injuries, mental health emergencies, bites, stings and poisoning, allergies and anaphylaxis, diabetes, search and rescue, leadership, teamwork and communication, communicable disease, lightning, submersion, urinary and reproductive system issues, medical decision-making, common wilderness medical problems, wilderness drug and First Aid kits	X		X

Patient assessment, management of life threats and scene safety, management of head, spine and musculoskeletal injury with minimal equipment, heat and cold emergency management, understanding of the limits and utility of ALS in the wilderness, preparation and packing of medical and personal gear, organization, leadership and participation in a simulated wilderness evacuation, emergency and extended medical care appropriate to a remote wilderness setting using available resources, appropriate attire for different conditions, food preparation using field rations and propane stove, performance of leave-no-trace skills, proficiency in expedition's mode of travel, expidition behaviors (teamwork, group decision making support, positive attitude during diversity), leadership skills, demonstration of sound judgement and decision making			
Role of expedition medical officer, patient assessment, lifting and moving patients, litter packaging, immobilization and carrying techniques, medical legal issues in remote care, lightning, hypothermia, frostbite, heat illness, trauma review and long term considerations, long term wound care, stapling and suturing, athletic injury management and taping, joint reductions, fracture management, spinal injury assessment and management, medical emergencies in remote settings, eye injuries, dental emergencies, search and rescue, survival lab, expedition health and hygiene, gender medicine, psychological emergencies, tropical medicine and travel considerations, altitude illness, dive emergencies, animal attacks and envenomations, evacuations and rescue considerations, mass casualty/triage exercise, expedition/remote site medical kits and clnics	X	X	X

Role of the medic in the remote area, patient assessment, lifting and moving patients, medical legal issues in remote care, hypothermia, frostbite and non-freezing cold injuries, heat illness, altitude illness, dive emergencies, animal attacks and envenomations, tropical medicine and travel considerations, expedition health and hygiene, CPR for the healthcare provider, airway management, IV therapy, kinematics of trauma, shock and fluid replacement, spinal injury assessment and management, litter packaging, imobilization and carrying techniques, extrication techniques, head injuries, thoracic trauma, mass casualty/triage, abdominal trauma, thermal trauma, soft tissue injuries trauma lab, essentials of prehospital care, athletic injury management and taping, dislocation management, fracture management, geriatric considerations, pediatric considerations, primary care/sick call, eye injuries, gender medicine, pain management, dental emergencies, psychological emergencies, acute abdominal illness, search and rescue, survival lab, medical emergencies, expedition/remote site medical kits and clinic	X	X	X
Differentiating between high-risk and convential medicine, top causes of preventable death in high-risk scenarios, identifying and treating life-threatening injuries, high-threat extraction techniques, mass casualty incidents, wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries	X	X	X
The course teaches an effective approach to patients presenting with a wide range of illnesses and injuries including trauma, cardiac, strokes, pediatric, obstetric, neonatal, airway compromise, sepsis, and neurological conditions	X	X	X

The course consists of seven different blocks of instruction each lasting twenty-five working days. The blocks are structured to progress a student from having no medical background to performing and understanding acute life-saving interventions in 36 weeks.	X	X	X

Medical Fundamentals (7weeks), SOCM Trauma Modules (7 weeks), Clinical Internship (4 weeks), Military medicine (3 weeks)		X	X
Week One: Week one covers refresher training for PALS, ACLS, BLS, TCCC, and some "hands on" emergency training. Week Two: Covers Basic Trauma Skills, PHTLS Review, WMD, Environmental emergencies, Field Training Exercise, and General Medicine.	X	X	X

The course is divided into 2 phases. Phase I is the Special Operations Combat Medic (SOCM) - course. Students are Ranger Medics, Recon(NEC 8427), SEAL(NEC 5392), and SBU(NEC 5392) students (6 months in length). Phase II is the SFMS/SOIDC – referred to as "The Long Course" (1 year in length to include SOCM). Usually Navy Recon students will return to complete the SFMS/SOIDC portion after a successful tour with an operational unit. The course consists of 5 academic modules: Laboratory Subjects, Veterinary Medicine, Surgery, Anesthesia, Records and Reports (SARR), a 24 day Special Operations Clinical Training rotation, and Special Forces Medical Sergeant Roles and Responsibilities. From start to finish, SFQC for a Special Forces Medical Sergeant lasts 60 weeks, including actual medical training of about 15 weeks.	X	X	X

Surgeon briefings from USSOCOM and Service Components, CSO, State Department, ASD/SOLIC (SSTR), and NGOs; SOF functional and regional briefings to include; CA, JSOTF C2, JPRA, EPW issues, Interagency Collaboration, USSOCOM Care Coalition, Medical Training, Logistics and Intelligence.			
This one-week course is comprised of lectures and syndicate work which result in syndicate presentations. Day 1 provides a broad overview of NATO structures and its operational and medical support planning processes. Day 2 focusses on NATO comprehensive operational planning directive (COPD) and the NATO operational planning process (OPP) with an emphasis on how Medical Support planning contributes to them. Day 3 concentrates on supporting operations in different environments and special planning considerations. Day 4 and 5 are syndicate-focused with an emphasis on developing and presenting a concept of operation for medical support within a joint multinational operation.			

Phase 1 (16 months, didactic): Freshman term: (course name - semester hours): Anatomy and Physiology I - 7 Biochemistry - 3 Microbiology - 5 Clinical Laboratory - 4 Medical Law and Ethics - 2 Research Evaluation - 2 Sophomore term: Anatomy and Physiology II - 7 Pathology - 3 Pharmacology I - 3 Radiology - 2 Psy Psychiatry - 3 EKG - 2 Endocrinology - 2 Military Publich Health and Dental - 2 Patient Evaluation I - 3 Junior term: Orthopedics - 4 Pulmonary - 2 Gastroenterology - 2 Cardiology - 4 Clinical Correlations I - 1			

Phase 1: online self-paced study, building on material and skills gained through military schooling and experience. Phase 2: clinical rotations and practicals provided at/near T1G Memphis. Phase 3: testing of practical skills and written test for final certification.			
Phase 1: high angle rescue. Phase 2: confined space/collapsed structure and vehicle extrication. 4-6 hours didactic followed by hands on practice.			

BLS, ACLS, PALS, PHTLS, dental emergencies, dental anesthesia with lab, regional anesthesia and lab, environmental emergencies (heat, cold, HAPE, HACE, MS, diving), exam and diagnosis of common musculoskeletal injuries with lab, medical mission planning, mass casualty management, medical bag packing, casualty evacuation and lab (military oriented platforms), advanced suturing techniques with lab, examination and diagnosis of somatic disorders (manual medicine) with lab, behavioral emergencies, complications of geriatrics, trauma patient assessment/treatment/management with lab, trauma skills practical vivarian lab			
General principles of nursing practice (transport physiology, scene operations, communications, safety and survival, management of man-made disasters, professional issues, management), Resuscitation principles (principles of assessment and patient preparation, airway management, mechanical ventilation, perfusion), trauma (principles of management, neurologic, thoracic, abdominal, orthopedic, burn, maxillofacial and neck), Medical emergencies (neurologic, cardiovascular, pulmonary, abdominal, electrolyte disturbances, metabolic and endocrine, hematology, renal, infectious and communicable diseases, shock, environmental and toxicological emergencies), Special populations (obstetrical patients, pediatric trauma and medical patients, geriatric trauma and medical patients, bariatric patients)	X	X	X

Preparatory topics: concepts and components of critical care, air medical considerations, transport physiology, lab data, basic radiographic interpretation, peripheral and central lines, hemodynamic monitoring, blood administration; Medical topics: respiratory, advanced airway, mechanical ventilation, pharmacology (neuro system), cardiology, 12-lead EKG interpretation, circulatory pharmacology, sepsis/MODS, gastrointestinal, renal urological, neuro/ICP, endocrinology, hematology; Trauma: burn and trauma care; Special populations: pediatrics, high risk obstetrics, fetal heart monitoring		X	X
General Principles of AHLS: hazardous materials epidemiology, important properties of hazardous materials, medical mangement of hazmat victims; Toxic inhalations: irritant gases, asphyxiants, antidotes (normobaric oxygen, hyperbaric oxygen, methylene blue, amyl nitrite, sodium nitrite, sodium thiosulfate, hydroxocobalamin; Insecticide poisoning: organophosphate and carbamate insecticides, antidotes (pralidoxime, atropine); Scenarios (tabletop exercises); Corrosives, hydrocarbons and substituted hydrocarbons; Miscellaneous toxicants; hydrazines, antidote (pyridoxine), hydrofluoric acid, antidote (calcium gluconate, calcium chloride); Toxic terrorism: an introduction to chemical, biological, radiological and nuclear terrorism, chemoterrorism - nerve agents, bioterrorism, radiation emergencies; additional tabletop exercises, mandatory exam			

Day I Skills Lab Vital Signs, Oxygen use and set up, Airway clearance and BVM support, NC/NRBM, OPA, NPA, Suction, Sterile Gloves, Foley, NG/OG, Vaginal Delivery, Suture/Staples insertion and removal, Patient Positioning/turning/nursing skills, Oral care/ wound care Day II Skills Lab IV Insertion and removal, IV maintenance drips, IV Push , Cric insertion/removal, Intubation, Patient Scenarios Day III Classroom Acute Renal Failure/Acute Kidney Injury, ARDS, PEEP, SEPSIS, Pharmacology, Nursing Skills, Burns, Ventilator/Suction use (Memo generating CME credit provided) ICU Rotation: This will be a culminating event rotating through ICU/ER/Wards at Womack to employ skills learned and shadow nursing staff for patient care.			
12-18 hour hands=on exercise in a deployed scenario			

TCCC

Bleeding	IV Access	Tranexamic Acid	Fluid Resuscutation	Prevention of Hypothermia	Penetrating Eye Trauma	Monitor Pulse Oximetry
			X			X
				X		
		X			X	X
		X			X	X

X	X		X	X	X	
X	X		X	X		

			X	X		
	X		X			
			X		X	

X	X		X	X		
					X	

X	X		X			

X						
X	X			X		X

X				X		X
	X					

	X		X	X		

X	X			X		X
	X		X			X
X						

X						

	X		X			X

x	x		x	x	x	x

				X		X
X	X			X		X

X	X			X		X
				X	X	

X	X			X		X

X	X			X		X
X				X		X

X	X			X		X
X	X		X	X		X

X	X		X	X		X
X	X			X		X
X	X			X		X

X	X			X		
X				X		
				X		

				X		
X	X			X	X	

X	X		X	X	X	X
X				X		
X	X		X	X		X

X	X		X			

X	X		X			
	X			X		X

X	X		X	X		

X	X		X	X		X

X	X		X	X		X

Inspect & Dress Wounds	Check for Wounds	Analgesia	Splint Fractures	Antibiotics	Burns	Communicate with Casualty
		X	X		X	
X	X					X
	X		X	X	X	X
				X	X	X

X	X	X	X			
X	X					X

X	X					
					X	
					X	X
X	X					

X					X	

X		X		X	X	

X	X					X
X	X	X				X

X	X	X				X
X						

X			X	X	X	X

X	X					X
X	X	X			X	X
X	X		X			

			X			

					X	X

X	X	X	X		X	X

X						
X	X					X

	X					X
						X

X	X	X	X		X	X
X	X	X	X			X

						X
X	X	X	X			X

X	X	X	X			X
						X
X	X		X		X	X

X	X		X		X	X
X	X		X		X	X
	X					X

X	X	X	X			X
						X
X	X		X			X

X	X	X	X	X	X	X
X	X		X			X
X	X	X	X	X		X

X	X		X			X
X	X	X	X	X		X

X	X	X	X	X	X	X
X	X		X			X
X	X	X	X	X		X

x	x	x	x	x		x

X	X	X		X		X
			X	X	X	X

X		X		X	X	X

X	X	X	X	X	X	X

		X			X	X
	X					X

CPR	Documentation of Care	Burn (8)	CSE (10)	CSF (13)	DCR (14)	FWBT (17)
X	X	X	X		X	X
	X				X	
	X	X			X	X
	X	X			X	X

	X				X	X
					X	

			X			
		X			X	
		X	X			
			X	X	X	

X		X	X		X	
			X		X	X

		X		X		X

X	X					
X	X					

X	X					
X						

		X				X

X	X		X			
X	X	X				

				X		
				X		

X	X	X	X		X	

X	X		X			

	X	X				
	X					

X	X	X	X			
X	X		X			

	X					
X	X		X			

X	X		X			
	X					
X	X	X	X			

X	X	X	X			
X	X	X	X			
	X		X			

X	X		X			
X	X					
X	X		X			

X	X	X	X			
	X		X			
X	X		X			

	X		X			
X	X		X			

X	X	X	X			
	X					
X	X		X			

	X			X	X	

X	X				X	
		X	X		X	X

X	X	X	X		X	

X	X	X	X			

X	X	X				
	X					

CPG's						
HBA (19)	HP (20)	MPSHI (27)	MWW (28)	NM (29)	PFC (31)	WVI (43)
	X	X	X		X	
	X					
	X	X				

X	X	X	X		X	
	X	X	X			

	X	X	X			
			X			
	X	X	X			
X		X	X		X	X

	X	X			X	
X			X			

X			X			

			X			
	X		X			

			X			X

X	X		X			

	X	X				
			X			

X					X	
X					X	X

X	X	X			X	

	X		X			X
	X					

	X					

	X					

	X					
	X	X				

	X	X				
	X	X				

	X	X				
	X					
	X					

	X					
	X					
	X	X				

	X					
	X					

	X	X				
	X	X	X			
	X					

X	X	X	X			X

			X			
	X	X	X	X		

	X		X		X	X

	X	X				

		X				

Mgt. Ped Trauma		**TCCC Topics Met:**	**Total TCCC Topics:**	**% TCCC Met:**	**CPG Topics Met:**	**Total CPG Topics:**
		7	19	**37%**	8	13
		6	19	**32%**	1	13
		10	19	**53%**	4	13
		0	19	**0%**	0	13
		9	19	**47%**	5	13

		13	19	**68%**	7	13
		10	19	**53%**	4	13

		6	19	**32%**	4	13
X		4	19	**21%**	4	13
X		3	19	**16%**	6	13
X		4	19	**21%**	9	13

X		9	19	**47%**	7	13
		0	19	**0%**	0	13
		0	19	**0%**	0	13
X		3	19	**16%**	6	13
		0	19	**0%**	0	13

		0	19	**0%**	0	13
		9	19	**47%**	5	13
		0	19	**0%**	0	13

		0	19	**0%**	0	13
		7	19	**37%**	1	13
		12	19	**63%**	2	13

X		11	19	**58%**	3	13
		4	19	**21%**	0	13
		0	19	**0%**	0	13

		0	19	**0%**	0	13
		10	19	**53%**	5	13

X		11	19	**58%**	4	13
X		12	19	**63%**	2	13
		6	19	**32%**	1	13

		0	19	**0%**	0	13
		0	19	**0%**	3	13
X		2	19	**11%**	5	13

X		4	19	**21%**	1	13
		0	19	**0%**	0	13

		0	19	**0%**	0	13

		4	19	**21%**	0	13
		0	19	**0%**	0	13
		0	19	**0%**	0	13

		0	19	**0%**	0	13
X		17	19	**89%**	8	13

		4	19	**21%**	3	13
		12	19	**63%**	2	13

		3	19	**16%**	1	13
		2	19	**11%**	0	13

X		15	19	**79%**	4	13
		11	19	**58%**	1	13

X		2	19	**11%**	1	13
X		13	19	**68%**	3	13

X		13	19	**68%**	3	13
		2	19	**11%**	0	13
X		13	19	**68%**	5	13

X		14	19	**74%**	5	13
X		15	19	**79%**	5	13
		3	19	**16%**	1	13

		15	19	**79%**	3	13
		9	19	**47%**	1	13
X		13	19	**68%**	3	13

		14	19	**74%**	3	13
		8	19	**42%**	2	13
		11	19	**58%**	3	13

		6	19	**32%**	2	13
		15	19	**79%**	2	13

X		18	19	**95%**	5	13
		10	19	**53%**	3	13
X		16	19	**84%**	3	13

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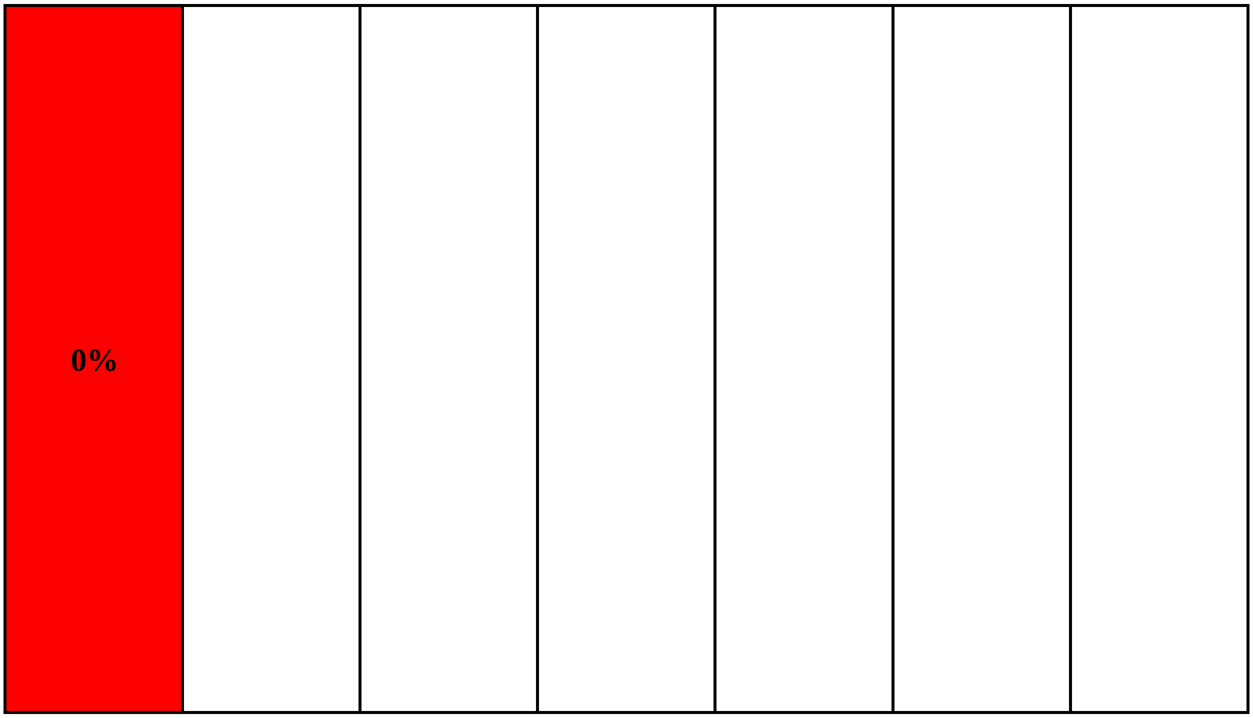
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	Instructional Methodologies					
Course Name	**Didactic**	**LT**	**Cadaver**	**SIM**	**Rotation**	**Scenario Based/Lanes/ Skill stations**
Critical Care Air Transport Team Advanced Course (CCATT)	x			x	x	x
Tactical Critical Care Evacuation Team Course (TCCET)	x			x		x
CCATT Course						
CCATT Course						
Critical Care Air Tranport Team (CCATT) Initial Course	x			x		x
Army Trauma Training Course (ATTC)	x			x		x
Combat Casualty Care Course (C4)	x			x		x
Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	x		x			
Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	x			x		

Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	x			x		
Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	x	x	x			x
Advanced Trauma Training Program (ATTP)	x	x	x	x	6hr shift	
CCAT Foundational Level	x					x
Special Operations Independent Duty Course	x	x		x		
Expeditionary Medical Unit Training	x					
Navy Trauma Training Course (NTTC)						
Tactical Combat Casualty Care Provider	x					
Joint Forces Combat Trauma Management Course (JFCTMC)	x	x	x	x		
Tactical Combat Casualty Care - All Combatants (TC3-AC)	x					
Tactical Combat Casualty Care - Medical Providers (TC3-MP)	x			x		

Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	x			x		x
TC3-MP	x			x		x
Tactical Emergency Casualty Care (TECC)	x			x		x
Joint Enroute Care Course (JECC)	x			x		x
Flight Medic Course (FMC)	x			x		x
JRTC - Combat Training Center (CTC) Program				x		x
Tactical Combat Medical Care (TCMC)	x	x				x
Advanced Trauma Care for Nurses (ATCN) with ATLS	x			x		x
Advanced Burn Life Support (ABLS)	x			x		
Brigade Combat Team Trauma Training (BCT3)	x			x		x
Military Transition Team Medical Course (MiTT)						
Advanced Surgical Skills for Exposure in Trauma (ASSET)	x		x			x
Combat Extremity Surgery Course (CESC)	x		x			x

Pediatric Fundamentals of Critical Care Support (PFCCS)	x			?		
Joint Medical Operations Course (JMOC)	x					
Military Medical Humanitarian Assistance Course (MMHAC)	x			x		x
Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	x					
Public Health Emergency Management (PHEM)						
Shipboard Surgical Trauma Training (S2T2)						
*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	x			x		x
Advanced Trauma Life Support (ATLS)	x			x		x

Advanced Trauma Operative Management (ATOM)	x	x		x		x
Rural Trauma Team Development Course (RTTDC)	x			x		x
Disaster Management and Emergency Preparedness (DMEP)	x					x
Advanced Disaster Life Support (ADLS)	x			x		x
Advanced Pediatric Life Support (APLS)	x			x		x
Advanced Wilderness Life Support (AWLS)	x			x		x
Basic Disaster Life Support (BDLS)	x					
Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	x			x		x
Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	x			x		x
Core Disaster Life Support (CDLS)	x					
International Trauma Life Support Basic (ITLS Basic)	x			x		x

International Trauma Life Support Advanced (ITLS Advanced)	x			x		x
International Trauma Life Support Pediatric (ITLS Pediatric)	x			x		x
International Trauma Life Support Access (ITLS Access)	x					x
International Trauma Life Support Military (ITLS Military)	x			x		x
Pediatric Advanced Life Support (PALS)	x			x		x
Prehospital Trauma Life Support - Provider (PHTLS)	x			x		x
Wilderness Advanced Life Support (WALS)	x			x		x
Wilderness Medicine for the Professional Practitioner (WMPP)	x			x		x
Wilderness Upgrade for Medical Professionals (WUMP)	x			x		x
Wilderness Medical Expedition (WME)	x			x		x
Remote Medicine for the Advanced Provider (RMAP)	x			x		x

Remote Medicine Upgrade and Certification (RMUR)	x			x		
Tactical Medicine Awareness Training (TMAT)	x			x		
Comprehensive Advanced Life Support (CALS)	x			x		x
Special Operations Combat Medic Course (SOCM)	x			x		x
Special Operations Combat Medic Course (SOCM)	x			x	30 hrs	
Special Operations Combat Medical Skills Sustainment Course	x			x		x
Special Forces Medical Sergeant (SFMS, 18D)	x			x	x	x
Special Operations Civil Affairs Medical Sergeant Course	x			x		x
Special Forces Medical Sergeant Refresher Course						
Joint Special Operations Medical Orientation Course (JSOMOC)	x					
Joint Medical Planner Course (JMPC)	x					
HOSPEX Training - Validation Events						
300-F1 Flight Paramedic	x			x	x	

300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	x			x	x	x
Paramedic (ASI F2) Recertification Course	x			x	x	x
Operating Room Specialist Course Phase 1	x			x	x	x
Operating Room Specialist Course Phase 2					x	
Critical Care Nursing Course	x				x	
Emergency Nursing Course	x				x	
Management of Burns and Multiple Trauma Course	x					
Oral and Maxillofacial Surgery Course	x					
Aeromedical Evacuation (AE)						
Emergency Nursing Pediatric Course (ENPC)						
Combat Casualty Care Course (C4)						
C4						
ATLS and ACLS						
ATLS and ACLS						
Navy Trauma Training Course (NTTC)						
Bushmaster Course						
Emergency War Surgery Course (EWSC)						

Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting						
Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course						
TBI for Deploying Providers						
Traumatic Brain Injury 201: Overview for Health Care Personnel						
Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)						
Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)						
Tactical Combat Casualty Care (TC3)						
Combat Extremity Surgery Course (CESC)						
Trauma Nurse Core Course (TNCC)						
ACLS						

Joint Enroute Care Course (JECC)						
Flight Medic Course (FMC)						
Emergency Nursing Pediatrics Course						
Advanced Burn Life Support (ABLS)						
Field Medical Service Technician (FMST) School						
Infection Control in a Deployed Envirnoment (6A0F22)						
Sexual Assualt Medical Forensic Examiner SAMFE						
Interservice Physician Assistant Program (IPAP)	x				x	
Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)						
NREMT-Paramedic Recertification Course						
Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)						
National Registry Paramedic Bridge Course	x				x	

Advanced Combat Trauma Training (ACTT)	x			x		x
Advanced Combat Medic Course (ACMC)						
Prolonged Field Care Course (PFC)	x			x		x
Applied Battlefield Medicine (ABM)				x		x
Vehicle Extrication Course (VEC)						x
Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	x					x
Basic Combat Trauma Training (BCTT)						
Advanced Tactical Practitioner (ATP)						
Certified Flight Registered Nurse (CFRN) Review Course	x					
Critical Care Emergency Medical Transport Program (CCEMTP)	x					
Advanced Hazmat Life Support (AHLS)	x					x
Intro to Prolonged Field Care	x			x	x	x
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Sustainment of Trauma and Resuscitation Program (STARS-P)					x	

Expeditionary Medical Readiness Course (EMRC)						
Expeditionary Medical Support (EMEDS)						
Aeromedical Evacuation and Patient Staging Course (AEPSC)						

CBT	MA	VR	Faculty Clinical Currency/Trauma Call etc	Standard Entry Level	Advanced
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Training Type					
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Air Force	Critical Care Air Transport Team Advanced Course (CCATT)	http://ccatt.info/index.php/ccatt/ccat-advanced-course
Air Force	Tactical Critical Care Evacuation Team Course (TCCET)	http://amops.org/wp-content/uploads/2015/04/CCATT-by-Patricio-Bruno-DO.pdf
Air Force	CCATT Course	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.51/afttp3-42.51.pdf
Air Force	CCATT Course	
Air Force	Critical Care Air Tranport Team (CCATT) Initial Course	http://ccatt.info/index.php/main-menu-resources/ccatt-initial/file/198-ccatt-initial-course-information-package

Army	Army Trauma Training Course (ATTC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6H-F31%2F300-F18&crstitle=ARMY+TRAUMA+TRAINING+COURSE&phase= http://ccn.aacnjournals.org/content/35/2/e11.full?sid=14a41642-af9b-4e37-898b-bf8e213046c7
Army	Combat Casualty Care Course (C4)	http://www.dmrti.army.mil/courses.html

Army	Advanced Trauma Life Support-Operational Emphasis Course (ATLS-OE)-Pre-Deployment, Initial and Sustainment Training	http://www.dmrti.army.mil/courses.html
Army	Pre-hospital Trauma Life Support-Pre-deployment, Initial, and Sustainment Training (PHTLS)	http://www.dmrti.army.mil/courses.html
Army	Trauma Nursing Care Course (TNCC)-Pre-deployment, Initial and Sustainment	http://www.dmrti.army.mil/courses.html
Army	Emergency War Surgery (EWSC)/Formerly Trauma Refresher Course for Surgeons (TRCS)	http://www.dmrti.army.mil/courses.html

Civilian/ Military	Advanced Trauma Training Program (ATTP)	http://www.rushu.rush.edu/servlet/Satellite?MetaAttrName=meta_university&ParentId=1320160660184&ParentType=RushUnivLevel4Page&cid=1297690892714&level1-ppp=1320160660114&level3_parent_page=1320160660114&pagename=Rush%2Fcontent_block%2FContentBlockDetail
NATO-UK Airforce	CCAT Foundational Level	http://www.ccat-training.org.uk/
Navy	Special Operations Independent Duty Course	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsIndependentDutyCourse.aspx

Navy	Expeditionary Medical Unit Training	http://www.med.navy.mil/sites/nmotc/nemti/Pages/CourseCatalog.aspx
Navy	Navy Trauma Training Course (NTTC)	http://www.med.navy.mil/sites/nmotc/nemti/nttc/Pages/default.aspx
Navy	Tactical Combat Casualty Care Provider	
Army	Joint Forces Combat Trauma Management Course (JFCTMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=6A-F19%2F300-F37&crstitle=JOINT+FORCES+COMBAT+TRAUMA+MANAGEMENT+COURSE&phase=

NATO/Army	Tactical Combat Casualty Care - All Combatants (TC3-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac
NATO/Army	Tactical Combat Casualty Care - Medical Providers (TC3-MP)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum

Civilian	Tactical Combat Casualty Care for All Combatants for Non-military personnel (TCCC-AC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-AC02&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+ALL+COMBATANT&phase= http://www.naemt.org/education/TCCC/tccc-ac
Civilian	TC3-MP	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2016&sch=772&crs=DMRTI-TCCC-TC3-MP01&crstitle=TACTICAL+COMBAT+CASUALTY+CARE+-+MEDICAL+PROVI&phase= http://www.naemt.org/education/TCCC/guidelines_curriculum

Civilian	Tactical Emergency Casualty Care (TECC)	http://www.naemt.org/education/tecc
Army	Joint Enroute Care Course (JECC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=c13159f5-f397-4504-ae33-d5c542c8759d
Army	Flight Medic Course (FMC)	http://www.cs.amedd.army.mil/Portlet.aspx?ID=73b51009-38ce-4f01-9700-3a8d7d1589fe

Army	JRTC - Combat Training Center (CTC) Program	http://www.globalsecurity.org/military/ops/ctc-jrtc.htm http://www.globalsecurity.org/military/ops/ctc-jrtc-scenario.htm Full description: http://www.apd.army.mil/pdffiles/r350_50.pdf
Army	Tactical Combat Medical Care (TCMC)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2011&sch=081&crs=6H-F35%2F300-F38&crstitle=TACTICAL+COMBAT+MEDICAL+CARE+(TCMC)&phase= http://www.first.army.mil/diveast/(X(1)S(4qf0inntvvshrk55bv4idcac))/documents/pdf/Coursedescription09.pdf

Civilian	Advanced Trauma Care for Nurses (ATCN) with ATLS	http://www.ucdmc.ucdavis.edu/cppn/classes/atcn.html http://www.traumanurses.org/atcn http://www.atls.in/atcn/courses-details.htm
Civilian	Advanced Burn Life Support (ABLS)	http://www.ameriburn.org/ablscoursedescriptions.php http://www.ameriburn.org/ABLSProviderObjectivesSummary.pdf
Army	Brigade Combat Team Trauma Training (BCT3)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-68W(BCT3)&crstitle=BRIGADE+COMBAT+TEAM+TRAUMA+TRAINING&phase=

Army	Military Transition Team Medical Course (MiTT)	https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2015&sch=081&crs=300-F40&crstitle=MILITARY+TRANSITION+TEAM+MEDIC+PRE-DEPLOYMENT&phase=
Civilian	Advanced Surgical Skills for Exposure in Trauma (ASSET)	https://www.facs.org/quality%20programs/trauma/education/asset
All	Combat Extremity Surgery Course (CESC)	https://sites.google.com/site/combatextremitysurgerycourse/

	Pediatric Fundamentals of Critical Care Support (PFCCS)	http://www.sccm.org/Fundamentals/PFCCS/Pages/default.aspx
Joint	Joint Medical Operations Course (JMOC)	http://www.dmrti.army.mil/courses.html
	Military Medical Humanitarian Assistance Course (MMHAC)	http://www.cdham.org/mmhac

Joint	Emergency Preparedness Response Course (EPRC) for CBRNE: Basic Awareness Short Course Executive Commander	http://www.dmrti.army.mil/documents/1_EPRC%20Course%20Descriptions.pdf
Joint	Public Health Emergency Management (PHEM)	http://www.dmrti.army.mil/courses.html
Navy	Shipboard Surgical Trauma Training (S2T2)	
Civilian	*Need to call to clarify - Core II: Operational & Disaster Medicine - Mass Casualty, Mass Fatality, Command Post Exercises, Search & Rescue, Collision Environments	https://www.wright.edu/national-center-for-medical-readiness

Civilian	Advanced Trauma Life Support (ATLS)	https://www.facs.org/quality-programs/trauma/atls
Civilian	Advanced Trauma Operative Management (ATOM)	https://www.facs.org/quality-programs/trauma/education/atom
Civilian	Rural Trauma Team Development Course (RTTDC)	https://www.facs.org/quality-programs/trauma/education/rttdc

Civilian	Disaster Management and Emergency Preparedness (DMEP)	https://www.facs.org/quality-programs/trauma/education/dmep
Civilian	Advanced Disaster Life Support (ADLS)	http://www.ndlsf.org/index.php/courses/adls
Civilian	Advanced Pediatric Life Support (APLS)	www.aplsonline.com
Civilian	Advanced Wilderness Life Support (AWLS)	http://awls.org

Civilian	Basic Disaster Life Support (BDLS)	http://www.ndlsf.org/index.php/courses/bdls
Civilian	Advanced Life Support-Pediatric Education for Prehospital Professionals (ALS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx
Civilian	Basic Life Support-Pediatric Education for Prehospital Professionals (BLS PEPP)	http://www.peppsite.com/PeppCoordinators/about.aspx

Civilian	Core Disaster Life Support (CDLS)	http://www.ndlsf.org/index.php/courses/cdls
Civilian	International Trauma Life Support Basic (ITLS Basic)	https://www.itrauma.org/education/itls-provider/
Civilian	International Trauma Life Support Advanced (ITLS Advanced)	https://www.itrauma.org/education/itls-provider/
Civilian	International Trauma Life Support Pediatric (ITLS Pediatric)	https://www.itrauma.org/education/itls-pediatric/

Civilian	International Trauma Life Support Access (ITLS Access)	https://www.itrauma.org/education/itls-access/
Civilian	International Trauma Life Support Military (ITLS Military)	https://www.itrauma.org/education/itls-military/
Civilian	Pediatric Advanced Life Support (PALS)	http://cpr.heart.org/AHAECC/CPRAndECC/Training/HealthcareProfessional/Pediatric/UCM_476258_PALS.jsp
Civilian	Prehospital Trauma Life Support - Provider (PHTLS)	https://www.naemt.org/education/PHTLS/whatisPHTLS.aspx

Civilian	Wilderness Advanced Life Support (WALS)	https://www.wildmed.com/wilderness-medical-courses/medical-professionals/wilderness-advanced-life-support/
Civilian	Wilderness Medicine for the Professional Practitioner (WMPP)	http://www.nols.edu/wmi/courses/wildmedpandp.shtml
Civilian	Wilderness Upgrade for Medical Professionals (WUMP)	http://www.nols.edu/wmi/courses/wildupgrademedpros.shtml

Civilian	Wilderness Medical Expedition (WME)	http://www.nols.edu/wmi/courses/wilderness_medicine_expeditions.shtml
Civilian	Remote Medicine for the Advanced Provider (RMAP)	https://www.remotemedical.com/training/remote-medicine-for-the-advanced-provider-rmap/

Civilian	Remote Medicine Upgrade and Certification (RMUR)	https://www.remotemedical.com/training/remote-medicine-upgrade-and-recertification-for-emt-rmur/
Civilian	Tactical Medicine Awareness Training (TMAT)	https://www.remotemedical.com/training/tactical-medicine-awareness-training/
Civilian	Comprehensive Advanced Life Support (CALS)	https://calsprogram.org/courses/full-day-provider-course/

Army	Special Operations Combat Medic Course (SOCM)	http://learn.jsomtc.org/ https://www.atrrs.army.mil/atrrscc/courseInfo.aspx?fy=2014&sch=331&crs=300-ASIW1&phase=&clsFlag=
Navy	Special Operations Combat Medic Course (SOCM)	http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicCourse.aspx

Navy	Special Operations Combat Medical Skills Sustainment Course	Server documents (JSOMTC folder) http://www.med.navy.mil/sites/nmotc/nsomi/Pages/SpecialOperationsCombatMedicSkillsSustainmentCourse.aspx https://www.atrrs.army.mil/atrrscc/prerequisites.aspx?fy=2005&sch=331&crs=011-F68&phase=&cls=003&clsflag=&startDate=2005-04-14&endDate=2005-09-22

Army	Special Forces Medical Sergeant (SFMS, 18D)	http://learn.jsomtc.org/ SOCM prereq document http://www.professionalsoldiers.com/forums/showthread.php?t=1483
Army	Special Operations Civil Affairs Medical Sergeant Course	http://learn.jsomtc.org/
Army	Special Forces Medical Sergeant Refresher Course	

Army	Joint Special Operations Medical Orientation Course (JSOMOC)	https://jsou.socom.mil/Pages/CourseInformation.aspx?CourseName=Joint%20Special%20Operations%20Medical%20Orientation%20Course Some info from previous JSOMOOC course
Army/NATO	Joint Medical Planner Course (JMPC)	http://www.natoschool.nato.int/Academics/Resident-Courses/Course-Catalogue/Course-description?ID=85
NATO-UK	HOSPEX Training - Validation Events	

Army	300-F1 Flight Paramedic	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.
Army	300-F2 Critical Care Cinical Skills Course (Flight Paramedic follow on)	Soldiers welcome packet and information about the course can be found at http://usasam.amedd.army.mil. POC: NCOIC 210-221-0993, 187th Med Bn., Bravo Company 210-221-0245, or Post Operator 210-221-1211.

Army	Paramedic (ASI F2) Recertification Course	300-NREMT-P/NRP RECERT POC at COMM: 502-613-5233.
Army	Operating Room Specialist Course Phase 1	301-68D10 Operating Room Specialist Phase 1
Army	Operating Room Specialist Course Phase 2	301-68D10 Operating Room Specialist Phase 2
Army	Critical Care Nursing Course	6F-F5 Critical Care Nursing
Army	Emergency Nursing Course	6F-F6 Emergency Nursing

Army	Management of Burns and Multiple Trauma Course	Special Information: 3698 Chambers Pass, FSH, TX 78234-6315. Send DA 3838 to: DHET, 2421 Hood St., Ste. B., FSH, TX 78234-6315 COMM: 210-295-9428 or DSN: 471-9428.
Army	Oral and Maxillofacial Surgery Course	6H-A0204 Oral and Maxollofacial Surgery Special Information: Course location: Primary: Fort Sam Houston, TX. How to enroll: Send DA 3838 to Graduate Dental Education, 2421 Hood St., Ste. B, FSH, TX 78234 COMM: 210 221-0079 or DSN: 471-0079 FAX: 471-2832.

Air Force	Aeromedical Evacuation (AE)	http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.5/afttp3-42.5.pdf
Air Force	Emergency Nursing Pediatric Course (ENPC)	https://www.ena.org/education/ENPC-TNCC/enpc/Pages/aboutcourse.aspx
Navy	Combat Casualty Care Course (C4)	
Navy	C4	
Navy	ATLS and ACLS	
Navy	ATLS and ACLS	
Navy	Navy Trauma Training Course (NTTC)	
Navy	Bushmaster Course	
Navy	Emergency War Surgery Course (EWSC)	
Navy	Concussion/Mild Traumatic Brain Injury (mTBI) in the deployed setting	

Navy	Military Acute Concussion Evaluation (MACE)/CPG/Department of Defense Instruction (DoD) Course	
Army	TBI for Deploying Providers	
Navy	Traumatic Brain Injury 201: Overview for Health Care Personnel	
Navy	Traumatic Brain Injury 301: Battlefield Management for Mild Traumatic Brain Injury (NM-12TBI301-1.0)	
Navy	Traumatic Brain Injury 401: Primary Care, Assessment and Management for Concussion (NM-12-TB140-1.0)	

Navy	Tactical Combat Casualty Care (TC3)	
Navy	Combat Extremity Surgery Course (CESC)	
Navy	Trauma Nurse Core Course (TNCC)	
Navy	ACLS	
Army	Joint Enroute Care Course (JECC)	
	Flight Medic Course (FMC)	
Navy	Emergency Nursing Pediatrics Course	
Navy	Advanced Burn Life Support (ABLS)	
Navy	Field Medical Service Technician (FMST) School	
Navy	Infection Control in a Deployed Envirnoment (6A0F22)	https:www.atrrs.army.mil/atrscc/course.aspx.

Navy	Sexual Assualt Medical Forensic Examiner SAMFE	
Army	Interservice Physician Assistant Program (IPAP)	http://www.cs.amedd.army.mil/ipap/
All	Special Operations Forces Tactical Medical Refresher (SOF TMR / ATP Refresher)	https://www.t1g.com/project/medical-certification-courses/

All	NREMT-Paramedic Recertification Course	https://www.t1g.com/project/medical-certification-courses/
All	Flight Paramedic Certification / Critical Care / Tactical Paramedic (FPC / CCP & TACP)	https://www.t1g.com/project/medical-certification-courses/
All	National Registry Paramedic Bridge Course	https://www.t1g.com/project/medical-certification-courses/
All	Advanced Combat Trauma Training (ACTT)	https://www.t1g.com/project/provider-level-courses/
All	Advanced Combat Medic Course (ACMC)	https://www.t1g.com/project/provider-level-courses/
All	Prolonged Field Care Course (PFC)	https://www.t1g.com/project/provider-level-courses/
All	Applied Battlefield Medicine (ABM)	https://www.t1g.com/project/medic-specialty-courses/

All	Vehicle Extrication Course (VEC)	https://www.t1g.com/project/medic-specialty-courses/
All	Combined High Angle Rescue Refresher & Extrication Course (HARR & E)	https://www.t1g.com/project/medic-specialty-courses/
All	Basic Combat Trauma Training (BCTT)	https://www.t1g.com/project/operator-level-courses/
All (Army, Navy, Air Force, Marine)	Advanced Tactical Practitioner (ATP)	atp@socom.mil
Civilian	Certified Flight Registered Nurse (CFRN) Review Course	http://www.bcencertifications.org/Get-Certified/CFRN.aspx

Civilian	Critical Care Emergency Medical Transport Program (CCEMTP)	http://ehspace.umbc.edu OR http://www.augusta.edu/mcg/em/com/ccempt.php OR http://www.centerem.org/courseseducation/ccemtp
Civilian	Advanced Hazmat Life Support (AHLS)	https://www.ahls.org/ahls/ecs/courses/courses.html

All	Intro to Prolonged Field Care	https://prolongedfieldcare.org/2016/07/09/prolonged-field-care-classes-for-68ws/ https://drive.google.com/folderview?id=0B7OAVQuGtbzAdVRhMDdKdzBsQWc&usp=sharing
Air Force	Sustainment of Trauma and Resuscitation Program (STARS-P)	AFI41-106 document
Air Force	Expeditionary Medical Readiness Course (EMRC)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf

Air Force	Expeditionary Medical Support (EMEDS)	http://digital.library.unt.edu/ark:/67531/metadc24116/m2/1/high_res_d/BRAC-2005_11164.pdf http://static.e-publishing.af.mil/production/1/af_sg/publication/afttp3-42.7/afttp3-42.7.pdf
Air Force	Aeromedical Evacuation and Patient Staging Course (AEPSC)	AFI 41-106 document http://static.e-publishing.af.mil/production/1/af_sg/publication/afi44-165/afi44-165.pdf

Enroute Combat Casualty Care, Rotary Wing Transport (CASEVAC), End Points of Resuscitation/Shock, Initial Properties in the Trauma Patient, Blood and Blood Component Administration, Thoracic Trauma, Abdominal Trauma, Head Trauma/Spine and Spinal Cord Injury, ARDC/Ventilator Lab, ACLS Updates, Sedation/Analgesia/Paralytics, Aeromedical Evacuation System, Aricraft Overview, Stresses of Flight, Infection Control, CRM, Aeromedical Evacuation Documentation, Flight Line Safety/Life Support, Thermal Injury/Burns, Extremity Trauma/Pelvic Fractures/External Fixation, Trauma in Special Populations, Acute Coronary Syndrome
Initial Priorities in the TCCET Patient, Tactical Critical Care Course, Difficult Airway Management, Documentation, Canine Care, Patient Movement Equipment Items, TCCET Rodeo, Planning/Static Execution Adult Simulator, TCCET Mission Planning/Patient Preparation Field Exercise, Mission Planning/Patient Preparation/Tricks of the Trade, Patient Preparation/Flight
Doctrine(CCAT and Aeromedical, Concepts, EMEDS, AE Primer), Altitude Physiology (Stresses of Flight, Chamber Rides), Clinical (Patient Flight Physiology, Acute Respiratory Failure, Mechanical Ventilation, Hemodynamic Monitoring, Burn Management, Clinical Issues), Operational (Allowance Standars/CCAT Team Bags, Transport Pharmacology, CRM, Eqpmt Approval, Flight Line Safety, Aircraft Familiarization, O2 Theramy/Systms, Hands-on Equipment Training, Litter Loading, Infection Control, Mission Managment and Documentation, Field Contigency Exercises)

Tourniquets/wound packing, junctional tourniquets, hypothermia prevention, patient transportation, pain management, JTS CPGs, infection control, damage control resuscitation, fresh whole blood, frozen blood, acoustic trauma, ocular trauma, UXO management, military working dog management, management of severe head injury, catastrophic care, TCCC cards, JTTS forms, radiology, REBOA, prevention of VAP, TeamSTEPPS, trauma teamwork system, trauma triage, medical decision making under stress, trauma/disaster orthopedic concepts (splint, traction splints, pelvic binders), airway management, chest trauma (surgical airway, needle decompression, chest seals, chest tubes), physiologic access, advanced thermal infusers/IV pumps, advanced anesthesia concepts, burr hole/craniotomy, lateral canthotomy, infection control, ET intubation, tib/hum/sternal IO
C4 prepares tri-service medical officers with the knowledge critical in conducting Role I & II healthcare operations in an austere, combat environment. C4 provides training in leadership skills, field medical knowledge and the practical information needed for direct medical support of tactical units under combat conditions. Progressing through the phases of TCCC from care under fire, tactical field and tactical evacuation care, through the echelons of care from point-of-injury to Role II scenarioes. Lanes are simulating mission-oriented medical scenarioes of Village Stability Operations (VSO), Mass Casualty (MASCAL) events, Military Operations on Urban Terrain (MOUT), Tactical Medical Lane (obstacle course), Tactical Evacuation Lane, and a simulated Role II facility utilizing simulator technology. Students encounter combat scenarios in varying roles of leadership and team organization, and participate in the planning

Clinical Practice Guidelines,JTTS, Mass Casualty/Triage, War Wounds, Enroute Care, Pediatric Trauma, Spinal Injury Management, Combat Extremity Fracture Management, Vascular Injuries, Pelvic Injuries, Amputations, DCR, Abdominal Injuries, Thoracic Injuries, Head Injuries/Trauma, Shock and Resuscitation, Face and Neck Injuries, Ocular Injuries, Field Critical Care, Soft Tissue Debridement, Human Cadaver Lab, Animal Salvage Lab

Military advanced trauma training, PTSD andTBI awareness/identification/treatment, New provider and renewal certification options for BLS, ACLS, PALS, ABLS, ATLS, ITLS, ADLS, BDLS, TNCC, CCEMTP, AHLS, Cadaver lab, live tissue lab, skills admistration and testing, combat trauma lane, ambulance ride along and level 1 trauma experience
The objective of the course is to give a thorough foundation in the art and science of Retrieval and Transport Medicine. Taught by experts in aviation physiology aerospace medicine, retrieval medicine, intensive care, emergency medicine and pre-hospital care. Addressing relevant issues of the special physical, physiological and psychological stresses that are important in various transport environments, and describes the conditions which are susceptible during transfers by land and air.
The student receives training in veterinary, dental, laboratory, medical diseases and case studies, nursing, initial and long-term wound care, Unconventional Warfare hospital, surgical procedures, pre-anesthesia, anesthesia, post anesthesia care, nursing care, records and reports, radiology, and central materials supply.

The course includes didactic instruction in casualty care at level III facilities, triage, primary and secondary survey of combat causalities, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat wound management, antibiotics and pain control in the combat environment, and combat fluid maintenance. Practical exercises for providers are conducted in airway management, surgical treatment of extremity trauma, chest, abdominal, head, neck and thermal wounds, and pain management/anesthesia delivery mechanisms. Practical exercises for nurses are conducted in airway management, ventilator management, chest tube management, intra-cranial pressure monitoring, central line management, methods of hemorrhage control, nursing management of compartment syndrome, and preparation of casualties for aeromedical evacuation.

Contains the foundation of all trauma training programs focused on treating the casualty, preventing further injuries and completing the mission.

Airway, drags and carries, hemostatic dressings (Celox gauze, chito gauze, combat gauze), limb tourniquets, peripheral pulses
Combat Application Tourniquet, nasopharyngeal airway, cric-key, needle decompression, ruggedized field IV, intraosseous infusion (FAST1). Supplementary modules: celox gauze, chito gauze, combat gauze, CRoC, JETT, SJT (SAM junctional TQ), SOFTT.

The course covers topics designed to decrease preventable death in the tactical situation, including: hemorrhage control, surgical airway control and needle decompression, strategies for treating wounded responders in threatening environments, caring for pediatric patients, and techniques for dragging and carrying victims to safety
Aeromedical rotor wing doctrine, transport equipment and packaging, advanced trauma and critical care management, combined skill aeromedical scenarios, UH60 and CH47 familiarization.
The FMC course provides selected medical enlisted personnel with the knowledge and skills required to conduct pre-Medical Evacuation (MEDEVAC) treatment, load/unload patients in MEDEVAC aircraft and stabilize/treat patients in flight. Soldiers will also have the capability to identify and utilize various MEDEVAC aircraft systems and Medical Equipment Sets, high performance hoist operations and in-flight crew duties as a non-rated crewmember, and perform aircraft radio communication.

Course Goals: The evaluation, resuscitation and management of the wounded soldier present a unique challenge to the medical provider. The modern battlefield and advancements in technology have changed our way of thinking in the approach to combat casualty management. Through “lessons learned” we have found that traditional ATLS/BTLS formats are not applicable to the combat casualty. This course will provide information on how to apply known concepts in trauma to the combat casualty in the combat environment. This course will emphasize the following concepts:

1. Initial Assessment of the combat casualty
2. Initial resuscitation and stabilization
3. Management of specific combat injuries
4. Emergency surgical procedures
5. Post resuscitation management

Students will train on the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of injury, triage, primary and secondary survey of combat casualties, combat airway management, combat extremity trauma, combat chest trauma, combat thermal burns, combat blood transfusions, combat extremity trauma, antibiotics and pain control in the combat environment, splinting and dressing workshop, and combat fluid maintenance

Didactic presentations on initial assessment, airway management, abdominal trauma, thoracic trauma, shock, head and spinal cord trauma, pediatric trauma, trauma in pregnancy, and stabilization and transportation.
Course objectives: Evaluate a patient with a serious burn Define the magnitude and severity of the injury Identify and establish priorities of treatment Manage the airway and support ventilation Initiate and monitor fluid resuscitation Apply correct methods of physiological monitoring Determine which patients should be transferred to a burn center Organize and conduct the inter-hospital transfer of a seriously injured burn patient.
Provides an opportunity for soldiers selected as Brigade Combat Team (BCT) units and the Flight Medic of Army MedEvac crews to acquire the technical and tactical skills needed to function as squad size trauma teams: A. Prepare unit and subordinate elements for peace and wartime missions and contingencies. B. Plan and execute tasks and missions assigned to squad size elements. The Brigade Combat Trauma Team Training (BCT3) course incorporates Tactical Combat Casualty Care (TC-3), emergency medical treatment and evacuation in a variety of operational combat settings from point of injury through to echelon III of the military health care system. The course is based upon the injury patterns of combat casualties and the constraints to deliver medical care on the battlefield and in urban warfare.

We will introduce, emphasize, and reinforce Tactical Combat Casualty Care principles, patient assessment and treatment, and the importance of adaptability, improvisation, innovation, self-reliance, and self- sufficiency. The NCO will be introduced to the role of medical advisor to US and Coalition Leadership on all health care matters.
Surgical exposures in neck, chest, abdomen/pelvis, and upper/lower extremities
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone

Prioritize assessment needs for the criticaly ill or injured infant and child Select appropriate diagnostic tests Identify and respond to significant changes in the unstable pediatric patient Recognize and initiate management of acute life-threatening conditions Determine the need for expert consultation and/or patient transfer and prepare for optimal transfer
1. Examine the planning factors and elements related to joint, coalition, and USG interagency medical planning, and DoD support to civil authorities. 2. Support the joint medical planning community in the development of the systems analysis, operational risk assessment, and field medical services planning. 3. Discuss HSS operations in the Joint Operations Area. 4. Categorize DoD and USG interagency deployable Health Service Support (HSS) capabilities. 5. Summarize the military medical continuum of care to include the patient movement system. 6. Identify resources and processes that are available to Medical Planners and Action Officers. 7. Demonstrate Joint Operational and Health Service Support Planning.
This course was developed by a multidisciplinary faculty assembled from individuals with experience in humanitarian operations and expertise in infectious disease, management of dehydration, malnutrition, preventive medicine and health education. The instructional strategy relies heavily on interactive processes (scenario exercises and case management based skill stations). The scenarios and cases are all derived from real operational experiences of instructors and allow students to problem solve and face ethical dilemmas in triage and develop creative logistical and clinical solutions. In class instruction parallels this manual which contains complete diagnostic and treatment algorithms for the targeted clinical conditions and has been derived from publications of international public health authorities. The course culminates in a round robin of “skill stations” in which students must demonstrate their ability to manage a field clinical scenario in each major category: Dehydration, Malnutrition, and Infections. In addition students must complete a comprehensive written exam

Basic: This course provides an overview of the different types of Chemical, Biological, Radiological, Nuclear, or high-yield explosives (CBRN) threats, information on how to prepare for and recognize a CBRNE threat, and instructions on the protective measures. It also explains disaster management and the actions it take to prepare for, respond to and recover from an all-hazards incident. Short: Refresher/Sustainment course is designed to prepare personnel to effectively respond to an all-hazards incident including those emanating from chemical, biological, radiological, nuclear, or high-yield explosives (CBRNE) sources. This course also explains the current global threat of CBRNE use, the characteristics and effects of threat agents, principles of personal protection, agent detection, recognition and emergency treatment of agent exposure, and the principles of triage and decontamination of CBRNE agent casualties. Executive: This is provides an overview of the National Incident Command System, National Response Framework, and the response from at the local, State, and National levels during an all-hazards incident. It describes how DSCA fits into the missions of homeland security (HLS) and homeland Defense (HLD) and describes how DoD supports HLS and HLD missions to provide civil support.
NCMR develps and delivers custom exercises for any organization in order to meet their unique requirements. The exercises conform to Homeland Security Exercise & Evaluation Program standards, and the NCMR team assists with exercise program management, design and development, conduct, evalation and improvement planning. They also offer discussion-based exercises (seminars, workshops, tabletop exercises and games) which focus on strategic, policy-oriented issues.

Systematic, concise approach to the care of a trauma patient; the course teaches a safe, reliable method for immediate management of injured patients including assessment techniques, resuscitation, stabilization and severity prioritization for possible facility transfer, while ensuring the provision of optimal care
Teaches proper operative technique for dealing with trauma injury, increasing self-efficacy in management of traumatic injuries, increasing knowledge in management of penetrating injuries, gaining the ability to successfully and safely perform all operative procedures presented in the course
The course is based on the concept that in most situations, rural facilities can form a trauma team consisting of at least three core members; the purpose of the course is to provide leadership and advocacy for rural trauma/surgical issues and the rural trauma patient. The objectives of the course include defining roles and responsibilities for team members, facility preparation, identification of local resources and limitations, patient assessment and resuscitation, early initiation of the transfer process, establishment of a performance improvement process, effective communication skills, and defining the relationship between the rural trauma facility and regional trauma system.

Epidemiology and history of disasters, disaster planning, disaster response organization and execution, medical management of mass casualties, pathophysiology and patterns of injury, postdisaster assessment and recovery, pitfalls and barriers in disaster planning and response, understanding the needs of special populations (pediatric, geriatric, disabled).

Course objectives include:explaining the shift from individual to population-based care in a disaster or public health emergency, practice mass casualty triage in a simulated disaster scenario, choose strategies to establish organizational and community surge capacity in a disaster or public health emergency, differentiate roles performed in an emergency operations center or incident command center established in response to a simulated mass casualty event, discuss legal, regulatory, and ethical principles and practices to enable health professionals to provide crisis standards of care in a disaster or pubic health emergency, select personal protective equipment and decontamination measures appropriate for personnel and public health protection in a disaster or public health emergency, and apply clinical skills for the management of mass casualties in simulated all-hazards scenarios.

The course content consists of core topics with additional topics that can be added per the instructor's decision. The main topics include pediatric assessment, pediatric airway in health and disease, shock, cardiovascular and central nervous systems, trauma, child maltreatment, nontraumatic surgical and orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia and children with special health care needs. The course has an optional PALS informational offering. Many of the topics covered are among the requirements for residency education in pediatrics, including: acute episodia medical illnesses (meningitis, sepsis, dehydration, pneumonia, diarrhea, renal failure, seizure, coma, hypotension, hypertension, respiratory illness), problems associated with chronic disease (diabetic ketoacidosis, status asthmaticus, status epilepticus, congenital heart disease, cystic fibrosis, gastrointestinal, metabolic and neurologic disorders). The manual outlines step-by-step over 90 procedures - these can be presented as skill stations by the instructor and include endotracheal intubation, placement of I/O and IV lines, umbilical artery and vein catheter placement, thoracic procedures, surgical airway techniques, wound care, suturing, splinting and casting

The course objectives including providing a practical foundation in Wilderness Medicine for medical professionals, teaching patient assessment and treatment guidelines for life support until defnitive care or evacuation is available, training providers the methods for managing medical and traumatic emergencies and urgencies in the wilderness when evacuation is unavailable or unnecessary, and teaching techniques and guidelines for evacuation

Course participants will be able to describe the following upon completion of the course: an all-hazard, standardized, scalable casualty management approach for use in disasters and public health emergencies, including life-saving interventions and medical decision making in an altered care environment; information sharing, resource access, communication, and reporting methods useful for health professionals during disasters and public health emergencies; the purpose and importance of the incident management system for providing health and medical support services in a disaster or public health emergency; field, facility, community and regional surge capacity assets for the management and support of mass casualties in a disaster or public health emergency; considerations and solutions to ensure continuity of and access to health-related information and services to meet the medical and mental health needs of all ages, populations, and committees affected by a disaster or public health emergency; public health interventions appropriate for all ages, populations and communities affected by a disaster or public health emergency; identification of potential casualty populations in a disaster or public health emergency, including persons with acute injuries or illnesses, those with pre-existing disease, injuries or disabilities, and those with age-related vulnerabilities and other functional and access needs, including their family/caregiver support network; deployment readiness components for health professionals in a disaster or public health emergency; all-hazards standardized, scalable workforce protection approach for use in disasters and public health emergencies, including detection, safety, security, hazard assessment, support, and evacuation or sheltering in place; actions that facilitate mass casualty field triage utilizing a standardized step-wise approach and uniform triage categories; the concepts and principles of mass fatality management for health professionals in a disaster or public health emergency; clinical assessment and management of injuries, illnesses and mental health conditions manifested by all ages and populations in a disaster or public health emergency; and finally,
Course focuses on pediatric assessment, airway skills, spinal stabilization, vascular access, children with special healthcare needs, respiratory emergencies, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions
Course focuses on pediatric assessment, airway skills, spinal stabilization, children with special healthcare needs, respiratory, child maltreatment, trauma, resuscitation and dysrhythmias, toxicology, children in disasters, emergency delivery and newborn resuscitation, shock, cardiovascular, medical emergencies, and child and family interactions

Course objectives focus on the following topics: all-hazards approach to disaster mitigation, preparedness, response and recovery; essential components of federal, state, regional, and community disaster health systems, including the role of public and private health sectors; elements of the PRE-DISASTER paradigm and their application to the management of disasters and public health emergencies; actions that can be taken to enhance personal preparedness and resilience for disasters and public health emergencies; legal and ethical issues that impact disaster mitigation, preparedness, response, and recovery, including the basic legal framework for public health; the elements of the DISASTER paradigm and their application for the management of disasters and public health
The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma
The didactic portion of the course includes scene size-up, trauma assessment and management, thoracic trauma, shock, head trauma, spinal trauma, abdominal trauma, extremity trauma, burns, pediatric and geriatric trauma, trauma in pregnancy, the impaired patient, trauma arrest, standard precautions; Skill stations include airway, assessment, thoracic trauma, vascular access, spine management, and extremity trauma
The didactic portion of the course includes: assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices

The didactic portion of the course includes: the tools to do the job, size-up, call for help and set-up, vehicle stabilization, accessing, stabilizing the victim, disentanglement, packaging and transfer. The course uses actual wrecked cares for skill practice, as the majority of the content is focused on practical skills.
The didactic portion of the course includes: scene size-up, assessment and initial management of the trauma patient, airway management, shock evaluation and management, thoracoabdominal trauma, head, spinal and extremity trauma, blast injury, burns, special populations (pregnant, pediatric, geriatric), special situations (intoxication and trauma arrest)
The course content includes: 1-rescuer child CPR and AED use, 1- and 2-rescuer infant CPR, management of respiratory emergencies, rhythm disturbances and electrical therapy, vascular access, resuscitation team concept, cardiac, respiratory and shock case discussions and simulations, systematic approach to pediatric assessment
The course provides a safe environment to practice trauma assessment and treatment skills while teaching valuable critical thinking skills that positively influence decision making. Topics covered include scene assessment, primary patient assessment, airway-breathing-circulation-disability, secondary survey/reassessment, team approach, communication skills, potential pitfalls, airway anatomy, procedures, adjuncts and injuries for adult and pediatric patients, breathing, ventilation and oxygenation support and treatment, circulation, hemorrhage control and shock (including anatomy, metabolism, pathophysiology, mechanisms and assessment of shock when there is no clear cause), CNS trauma, brain and spinal cord injuries and management, special considerations and unique aspects of pediatric, geriatric and multiple patients

The course focuses on procedures and technologies that are most appropriate for extreme environments and extended-care context, providing well-rounded exposure to the challenge of providing advanced medical care in a difficult environment. A large portion of the course is devoted to hands-on training and general principles of wilderness and rescue medicine, and a significant amount of time is spent outdoors. Pre-course study guides are mailed 2-4 weeks before the course, and participants take an on-line pretest and complete case study assignments prior to the beginning of the course. Skill labs include basic and advanced airway techniques and equipment, cardiovascular emergencies and wound management. Moulage and simulation scenarios are utilized during hands-on instruction.
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure
The course is focuses on professional medical practitioners and teaches them to build on a background in urban emergency care and learn how to improvise equipment, deal with challenging environmental conditions and make difficult medical decisions in remote locations

The course is influenced by weather, terrain and the characteristics of the individuals involved, and are thus not fully scripted. Given the variables, the depth of topic coverage may vary.
Course educates participants on immobilization and carrying techniques, litter packaging cold and heat emergencies, joint reductions, fracture management, spinal injury assessment and management, eye injuries, dental emergencies, expedition health and hygiene, psychological emergencies, tropical medicine, altitude illness, envenomation, evacuations, rescue considerations, mass casualty incidents, triage situations, how to utilize medical kits and manage remote site clinics

This course refreshes all REMT curriculum, including high-level medical skills and topics that include advanced wound closure (suturing), Foley catheterization, antibiotic therapy, IV administration, sick call and primary care, pediatrics, geriatrics, and childbirth. Additionally, the course covers travel medicine, telemedicine, medical kit integration, lifting and moving patients, advanced airway management, oxygen administration, shock, thoracic trauma, head injuries, dental emergencies, musculoskeletal injuries, respiratory and cardiac emergencies, mass-casualty incidents, anaphylaxis, cold and heat emergencies, altitude, immersion, and submersion among others.
The course reviews the difference between high-risk and convential medicine, the top causes of preventable death in high-risk scenarios, how to properly identify and treat life threatening injuries, high-threat extraction techniques, and what to do during mass casualty incidents. The course also covers wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries
This two-day provider course provides CALS core curriculum and serves as the foundation for all of its learning opportunities, presented on-site in rural or remote hospitals, offering interactive sessions in cardiac, traumatic, pediatric, obstetrical, neonatal and medical advanced life support; team attendance is encouraged; the course expects demonstration of the ability to problem solve in a variety of clinical situations, identification of key threats and demonstration of therapeutic interventions, discussion of the roles of each team member involved in patient evaluation and treatment, and performance of skills consistent with the provider's role on the advanced life support team.

The SOCM student will be proficient in the following areas/objectives upon completing the course. Basic Life Support (BLS) -certifies students through the American Heart Association (AHA) approved curriculum; Emergency Medical Technician -prepares students to sit for the National Registry for Emergency Medical Technician (NREMT) exam and culminates with NREMT certification; Medical Math -instructs how to prepare, calculate, and administer medications; Anatomy and Physiology -instructs the structures and functions of the 11 organ systems and how to identify the anatomical structures and their functions on cadavers in the laboratory; Physical Examination -instructs patient interaction, history taking, physical examination techniques, clinical decision making, and documentation and introduces students to radiology and laboratory procedures; Clinical Medicine-instructs pathophysiology, pharmacology, preventive medicine and medical management of weapons of mass destruction; Dental -instructs the basic emergency dental care in an austere environment; Advanced Cardiac Life Support (ACLS) - certifies students in ACLS through the AHA approved curriculum; Pediatric Education for Prehospital Professionals (PEPP) -certifies students in PEPP through the approved PEPP curriculum; Military Medicine -instructs medical planning in support of tactical operations, preventive medicine and weapons of mass destruction; Trauma -instructs pathophysiology, assessment, and management of traumatic injuries; Advanced Trauma Practical Skills -instructs intravenous and intraosseous access, endotracheal intubation, needle decompression, tourniquet application, nasogastric intubation, urinary catheterization, and Extended Focused Assessment with Sonography in Trauma (E-FAST) examination; Trauma Patient Assessment-instructs assessment and management of a trauma casualty; Combat Trauma Management - instructs additional life-saving trauma interventions including hemorrhage control, cricothyroidotomy, venous cutdown and tube thoracostomy and further enhances overall trauma management skills; Tactical Combat Casualty Care (TCCC) -instructs TCCC, triage, casualty collection point operations, and multi-purpose canine emergency and trauma care; Advanced Trauma Management -instructs medical leadership and utilization of additional resources in the management of complicated trauma patient scenarios through the use of patient simulators; Advanced Tactica l Paramedic (ATP) Examination - certifies students as Advanced Tactical Paramedics; Field Training Exercise - serves as the culmination exercise for the
The course provide training in Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; patient management skills; pre-hospital trauma emergencies and care; tactical combat casualty care skills; operating room procedures; minor surgical skills; NREMT-Basic examination; obstetrics/gynecology and pediatric emergencies; cardiac pharmacology; Advanced Cardiac Life Support (ACLS); EMT Paramedic clinical rotation and field internship consists of a 2-week hospital rotation in the emergency department, labor and delivery, surgical intensive care, pediatric emergency department, operating room, and a 2-week ambulance rotation with an assignment to an Advanced Life Support EMS unit responsible for responding to a variety of 911 emergency calls; USSOCOM EMT-Paramedic exam; care of the trauma patient in a field environment; preventive medicine; Nuclear, Biological and Chemical (NBC) casualty care, and nursing care; 30 hours of clinical rotations in clinics located on Fort Bragg, NC, conducting sick call under the

Environmental emergencies (altitude, heat, snake bite, insect bite, cold injury), airway management, physical therapy evaluation, pharmacology, shock, thoracic trauma, airway oxygenation and ventilation, TBI, thermal trauma, crush injury, austere planning and evacuation, mass casualty management, field blood transfusion, patient movement techniques, animal care, medical emergencies in canines, shearing and aid bag packing, trauma skills (airway, patient assessment, surgical cric, intubation, TCCC, wound dressing, tourniquet, orthopedic injuries/splints, IV, hypovolemic shock, triage, control bleeding, NCD, neurological exam, vital signs, manage burns, cardiac arrest/ECG)

Basic Life Support/Automatic External Defibrillation (AED); pharmaceutical calculations; anatomy; physiology; pathophysiology; medical terminology; basic physical exam techniques; medical documentation; pharmacology; basic airway management; medical patient assessment; advanced airway management; prehospital trauma emergencies; patient management tasks/skills; advanced trauma skills; operating room procedures; minor surgical skills; obstetric and pediatric emergencies; crdiac pharmacology; Advanced Cardiac Life Support (ACLS), clinical/ambulance rotation; extended care to the trauma patient in a field environment; mass casualty; military triage system; medical mission planning; medical threat; preventive medicine; physical examination; veterinary; dental laboratory; medical diseases and case studies; nursing; initial and long-term wound care; echelons of care (EOC) including training in combat trauma management, UW hospital, surgical procedures, preanesthesia, anesthesia, postanesthesia care, nursing care, records and reports, radiology, and central materials supply; attends a special operations clinical training site (30 days at a U.S. Army medical training facility within CONUS) including clinical training/experience and evaluation on ability to apply patient assemssment/management/care skills in various clinical settings; rotations through surgery, dermatology, pediatrics, orthopedics, radiology, preventive medicine/community health, and the outpatient/family practice clinic.
The course content consists of Civil Information Management, Medical Information and Intelligence, Civil Medical Engagements, Civil Reconnaissance, Occupational and Environmental Assessments, Arthropod-borne Disease Risk Management, Host Nation Food and Water Risk Management, and Veterinary and Agricultural Studies.

The course will familiarize attendees with the US SOCOM Mission, roles and capabilities with focus on medical operations in the joint SOF setting. Areas of emphasis will include operations/plans, current lessons learned, intelligence, medical force protection, operational risk assessment, health surveillance and SOF relevant clinical subjects.
Learning objectives: Describe NATO Medical Command and Control structures: Given a scenario, students from different nations and cultures will be able to describe NATO command, control, and force structures in accordance with current practices. Comprehend NATO Comprehensive operational planning process and medical support: Given a scenario, students will explain terms and procedures used to support the NATO comprehensive operational planning process (COPD & OPP) and multinational medical support planning. Understand NATO Medical Doctrine: Given a scenario, students will describe the different levels and content of medical support doctrine and policies. Synthesize NATO Operational Medical Planning Process: Given scenarios, students will develop a medical support plan IAW references that details the required components of a medical support plan within military, humanitarian, and joint multinational operations. Apply Multinational aspects of Medical Support applications: Given scenarios, students will develop a Medical ConOps IAW with references that outline key considerations for joint multinational medical support planning within military, humanitarian, and joint operations.

Students will receive both didactic and clinical training required for application and testing as an NREMT-Paramedic.
This course consists of 2-weeks of class room didactics in critical care medicine and path physiology, key elements of enroute critical care, and 6-weeks of in hospital practical experience, ground, and air ambulance observation with San Antonio EMS, and air ambulance observation with local providers of this care.

Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of combat chest wounds, and lifesaving emergency surgical skills on high fidelity simulation manikins. Students will conduct scenarios in both clinical environment and high fidelity aircraft environment. All scenarios and exercises will refresh critical care knowledge and provide recertification for the NRP.
Phase 1 (9 weeks 1 day) didactic study includes: basic anatomy and physiology; vital signs, cardiopulmonary resuscitation; principles and methods of decontamination, sterilization and disinfection; storage and handling of sterile supplies; identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metalware; duties of the scrub and circulating technician; principles and practices of sterile technique and standard precautions; transporting and positioning patients; operating room safety; handling of specimens, medications, dyes and hemostatic agents; and surgical specialties as they relate to selected surgical procedures. An FTX is also incorporated into the course. Phase 2 (10 weeks) is on-the-job training in the clinical environment. Total course length: 19 weeks 1 day.
Supervised OJT focuses on the principles of surgical technology practice, and the instruments, supplies, and equipment for surgical procedures. Clinical study and practicum includes anatomy and physiology, vital signs, cardiopulmonary resuscitation, principles and methods of sterilization and disinfection, storage and handling of sterile supplies, identification and care of surgical instruments, specialized equipment, sutures, needles, blades, linen, and corrosion-resistant metal ware, duties of the scrub and circulating technician, principles and practices of sterile technique and standard precautions, transporting and positioning patients, operating room safety, handling of specimens, medications, dyes and hemostatic agents, and surgical specialties as they relate to selected surgical procedures.
The consolidated curriculum will include didactic critical care nursing theory, patient movement, and operational environment training, followed by 9-weeks of clinical tracks in medical and surgical intensive care units and the emergency department training at San Antonio Military Medical Center (SAMMC) focusing in specialty area.
The consolidated curriculum will include emergency/trauma and critical care theory, patient movement, and operational environment training followed by 9-weeks of clinical tracks in the emergency department and medical and surgical intensive care units focusing in specialty area.

Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support.

Course participants will receive didactic training on the management of burn and multiple trauma injuries from point of injury to reintegration with topics including: appropriate burn wound care, inpatient and outpatient burn rehabilitation, amputee management, amputee rehabilitation, prosthetic use, TBI care, nutrition care, and management of fractures. Special emphasis will be placed upon minimizing devastating and lifelong disability and maximizing functional outcomes. An opportunity is also provided for those who wish to acquire certification in Advanced Burn Life Support.The program stresses following review of problems and complications in exodontia and oral surgery; the emergency treatment, evacuation, and definitive care of patients with traumatic injuries of the maxillae, mandible, and facial bones associated with the dental arches; diagnostic procedures, anesthesia and extraoral roentgenographic techniques for oral surgery; differential diagnosis of infections of the mouth, head, and neck; dentoalveolar surgery, control of hemorrhage, diagnosis and treatment of shock, tracheotomy; and management of maxillary sinus complications associated with oral surgery procedures. The pathology and treatment of oral keratoses, odontogenic cysts and tumors as well as the role of the dentist in the management of benign and malignant oral lesions is discussed. Principles and trends in antibiotic and chemotherapy receive considerable attention.

Phase 1 didactics last approximately 16 months. During this time, students are exposed to the basic medical sciences and progress into clinical medicine courses that help them understand critical medical concepts and application of those concepts in patient scenarios. Phase 2 training lasts approximately 13 months (including hospital orientation and mandatory facility training). During that time, students rotate through a variety of clinics in order to gain clinical knowledge and experience.

Advanced mechanical ventilation, emergency burn evaluation and care, emergency neck and chest trauma, emergency pediatric trauma, emergency pregnancy related injuries, emergency shock evaluation and treatment, emergency stabilization and trainsfer, emergency trauma assessment, head trauma, pediatric heat and cold submersion, transport nursing safety and survival, trauma in the elderly, trauma of the muscular and skeletal systems, trauma to the abdomen, traumatic submersion injuries

Pathophysiology, pharmacology, 12-lead ECG interpretation, interpretation of lab values, interpretation of routine diagnostic images, ventilator management, aortic balloon pump management, and air medical concepts
Epidemiology of hazardous materials, toxic inhalations, pesticide poisoning, corrosives, hydrocarbons, halogenated hydrocarbons, miscellaneous toxicants, toxic terroism (chemical, biological, radiological and nuclear incidents); by completion of the course, participants will be able to rapidly assess hazmat patients, recognize toxic syndromes (toxidromes), discuss the medical management of hazmat patients, apply the poisoning paradigm, and identify and recognize appropriate administration of specific antidotes

Discusses the differences between typical TCCC and PFC, with a focus on certain interventions that vary between TCCC and PFC: patient monitoring, resuscitation, ventilation, definitive airway control, pain control, exam and diagnostics, nursing/hygiene/comfort, advanced surgical measures, telemedicine consult, and preparing for transport. The objectives are to increase 68W Medic education and awareness of common medical/trauma issues that require further training than what is taught in AIT, establish a base in common nursing skills, and assist caring for patients; often when a provider is not available.
LOAC, code of conduct, AFMS mission, C3i, vehicle/aircraft patient loading, litter carries

Deployment Adminstration (8hrs), Core Content (25.5hrs), Skill Training(7hrs), Operational Training(17.5hrs), Corps Specific Training(45hrs for each discipline, ie physicians, nurses, respiratory therapists)							X			X		
Deployment Administration (5hrs), Core Content (12.5hrs), Skills Training(5.5hrs), Operational Training(17hrs)		X						X			X	X
			X			X			X	X		X
Doctrine (hrs), Altitude Physiology (hrs), Clinical (hrs), Operational (hrs)		X	X			X			X	X		

Phase I: 5 day didactic and simulation training, focus on TCCC topics and CPGs, providers attend the Advanced Surgical Skills for Exposure in Trauma course and the Combat Extremity Surgery Course. Uses a 5-person team approach, with TeamSTEPPS. Concludes with intensive situational training exercise. Phase II: Clinical rotation schedule. Members rotate through trauma resuscitation unit and operating room and trauma intensive care unit, using TeamSTEPPS and the 5-person team approach. Phase III: Capstone Exercise, trainees assume control of the trauma resucitation unit, observation area, and trauma operating room at Ryder for a set period of continuous operations. FST members manage all patients who arrive at the trauma center. Train on live patients.	X	X	X	X	X		X	X	X		X	X
Day1: Processing, Day 2-4:Specific trauma certificaiton courses (ATLS, PHTLS, TNCC), Day 4-6: TC3, Village Stability Operations, MASCAL lane, Tactical Medicine Movement Course, Military Operations on Urban Terrain VIRTRA simulation, Role 2 simulation, TACEVAC UH60 Simulation, PFC, Medical Leadership, Day 7: PFC training exercise (FTX), Day 8: CBRNE training	X	X	X	X	X		X	X			X	X

Initial Assessment and Mangement, Airway and Ventilatory Management, Shock, Thoracic Trauma, Abdominal Trauma, Skills Stations, Surgical Skills, Head Trauma, Spine and Spinal Cord Trauma, Musculoskeltal Trauma, Cold/heat Injuries, Extreme ages, Trauma in women, Transfer to definitive care, Austere Environement	X	X					X	X			X	X
Kinematics of Trauma, Patient Assessment, Airway Management, Shock and Fluid Replacement, Spine Trauma, Pediatric Trauma, Thoracic Trauma, Abdominal Trauma/Trauma in Pregnancy, Head Trauma, Musculoskeltal Trauma, Thermal Trauma		X			X		X					
Trauma Nursing Core Course and Trauma Nursing, Biomechanis and MOI, Initial Assessment, Shock, Brain and Cranial-facial Trauma, Thoracic and Neck Trauma, Geriatric Trauma, Abdominal Trauma, Spinal Cord and Vertbral Column Trauma, Musculoskeletal Trauma, Burn Trauma, Trauma and Pregnancy, Pediatric Trauma, Psychosocial Aspect of Trauma Care, Stabilization, Transfer and Transport, Battlefield Triage, Battlefield Wounds	X											
Didactic(20hs), Cadaver Lab (6.5hrs), LT Lab (2.5hrs)							X		X		X	X

Module 1: ITLS Assessment Skills Training and Testing, Module 2: BDLS, Module 3: Combat Sressor Awareness/TBI, Module 4: Cadaver Lab, Module 5: LT Laboratory, Module 6: Combat Trauma Lanes/MASCAL Exercise, Simulation Lab, Ambulance Ride-along, Module 8: Level 1 Trauma Rotation		X	X	X	X		X	X			X	
2 days of extreme physiology (Transport physiology, Biodynamics, Environmental extremes). 2 days of clinical aspects of retrieval medicine (Pathophysiology, Clinical concerns, Transportable medcial equipment). 2 days of logistic & command issues in medical transport (Organisation, Medicolegal issues, Standards and safety).												
Laboratory (3 weeks), Medicine (5 weeks), Surgey/Anesthesia/Nusing (4 weeks), Dental (1 weeks), Spec Ops Clinical Training (4 weeks), Gurerilla Hospital Methods (I weeks), Veterniary (2 weeks)												

JTTS, Clinical Practice Guidelines, Initial Triage and Assessment, Neurotrauma, Ocular Trauma, Neck Injuries, Traumatic and Difficult Airway, Thoracic Trauma, Spinal Trauma, Abdominal Pelvic Trauma, Perineal Trauma, Orthopedic Trauma, Traumatic Amputations, DCR and Blood Products, Pediatric Trauma, Patient Handling, Disposition of Remains, Medical Ethics, Battlefield Afghanistan and Current Injury Patterns, Psychosocial Aspects, Wounded Warrior Panel Discussion, Mild TBI, TMIP	X	X						X				
Breakouts for specific subspecialties include: orthopedic, general surgery, emergency medicine, anesthesia, nursing, etc.		X	X	X	X		X				X	

1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care 4. Tactical Evacuation Care 5. Scenarios for TCCC		X		X							X	X
1. Intro to TCCC 2. Care Under Fire 3. Tactical Field Care #1 4. Tactical Field Care #2 5. Tactical Field Care #3 6. Tactical Evacuation Care 7. Direct from the Battlefield		X	X	X	X			X		X	X	X

Phase 1: Direct Threat Care (emphasis on mitigating the threat, moving the wounded to an area of relative safety, managing massive hemorrhage, rapid positional airway management if feasible), Phase 2: Indirect Threat Care (once casualty is in an area of relative safety, assessment and treatment priorities focus on preventable causes of death - major hemorrhage, airway, breathing/respirations, circulation, head and hypothermia, and everything else (MARCHE)), Phase 3:Evacuation care (moving the casualty toward a defnitive treatment facility while performing reassessment of interventions and hypothermia management)		X	X	X				X		X	X	X
Phase I: Mandatory distance learning modules covering Aeromedical and Aviation specific content areas. Phase II: 12 day residence course with additional didactic content and extensive hands-on practical exercises, culminating with comprehensive written exam and graded practical exams on equipment and Critical Care Transport simulation.		X			X						X	
Phase I: Distributed Learning phase available thru BlackBoard. Covers 63 hours of medical and aeromedical subjects relevant to performing tasks required by a flight medic in the follow-on training during Phase II. Phase II: covers knowledge and skills in the areas of ACLS, Flight Medic Pharmacology, Drug Dosage Calculations, ITLS, PEPP, critical care management of a patient in a medical evacuation aircraft platform, Rapid Sequence Induction, Helicopter Underwater Egress Training, High Altitude Chamber, Personal Recover Operations, Survival Training, Canine Trauma Management.												

Rotation: 16 days. Day 1-4 in Intermediate Staging Base, days 5-16 spent performing the exercise itself. Three operational phases: insertion and counter-insurgency operation, defense in response to attack, and attack into a MOUT complex. Mission Readiness Exericse: 12 days, include legally intense issues associated with a peacekeeping deployment. Exercises attempt to replicate the Collocated Operating Base (COBs) and issues that will be encountered by the unit in the region.												
Each topic presented in PowerPoint format. At the end of the course, students will practice their procedural/emergency surgerical skills in a live tissue lab. Final event is trauma lanes conducted in a field environment that will progress through three phases of care: care under fire, tactical field care, and casevac - the trauma lanes are aimed at tying in all of the information presented throughout the course, will culminate with surgical skill exposure designed to match the trauma lane scenario. Small group AAR after each scenario.	X	X			X		X	X			X	

Skill stations: Initial assessment and management Airway and ventilatory management Pediatric Trauma Hemorrhagic shock Spine and extremity injuries Head trauma		X	X	X	X			X		X	X	X
Chapter 1: Ch2: Initial assessment and management Ch3: Airway management and smoke inhalation injury Ch4: Shock and fluid resuscitation Ch5: Burn wound management Ch6: Electrical injury Ch7: Chemical burns Ch8: Pediatric burn injuries Ch9: Stabilization, transfer, and transport Ch10: Burn disaster management		X	X		X		X			X	X	X
The Health Care Specialist receives specific training in the concepts of tactical combat medical care given realistic scenarios to include Army equipment, supplies and evacuation capabilities during combat. The course includes didactic instruction in casualty care at the point of wounding, triage, primary and secondary survey of combat causalities, airway management, extremity trauma, chest trauma, thermal burns, wound management in the combat environment, splinting and dressing. Practical exercises are conducted in airway management, treatment of extremity trauma, treatment of chest wounds, packing of medical treatment bags, life-saving emergency surgical skills, and the evaluation and management of mass causalities utilizing simulated combat casualty scenarios.		X	X	X							X	X

Objectives: Demonstrate knowledge of key anatomical exposures for the care of injured and acutely ill surgical patients Demonstrate technical ability to expose important structures that may require acute surgical intervention to save life or limb Gain confidence in performing anatomic exposures independently Faculty assessment of a student's ability to independently perform anatomical exposures will be satisfactory												
Course curriculum: Intro to the combat injured patient (overview of unique wounding, injury, and population characteristics), soft tissue management of combat injuries, washout and debridement, management through ecchelons of care, external fixation (knee, elbow, ankle, pelvis, long bone), combat zone management through LRMC, capabilities and limitations at LMRC, Level IV-V management and beyond, recent updates/wounding patterns, open pelvic fracture CPG, multiple amputees, limb salvage of severe combat injuries, compartment syndrome (vascular access and emergency shunting, vascular approaches, fasciotomies), combat axial skeletal trauma, pediatric trauma in the combat zone, specific hand combat/deployment trauma, specific appendicular skeletal combat trauma, burn management in combat zone				X								

Chapters: Assessment of critically ill child, airway management, pediatric cardiac arrest, diagnosis and management of the child with acute upper and lower airway disease, mechanical ventilation, diagnosis and management of shock, acute infections, fluids/electrolytes/neuroendocrine metabolic derangements, traumatic injuries in children, pediatric burn injury, nonaccidental injuries diagnosis and management, pediatric emergency preparedness, management of the poisoned child, transport of the critically ill child, neurologic emergencies, management of the child with congential heart disease, oncologic and hematologic emergencies and complications, acute kidney injury, postoperative management, sedation/analgesia/neuromuscular blockade, invasive medical devices		X			X		X			X		

	X		X									
Initial assessment and management, airway and ventilatory management (including cricothyroidotomy), shock assessment and management, venous cutdown, thoracic trauma (x-ray identification of thoracic injuries, chest trauma management), abdominal and pelvic trauma (focused assessment sonography in trauma - FAST, diagnostic peritoneal lavage), head and neck trauma assessment and management, x-ray identification of spine injuries, spinal cord injury assessment and management, musculoskeletal trauma assessment and management, thermal injuries, pediatric trauma, geriatric trauma, trauma in pregnancy and intimate partner violence, transfer to definitive care												

	X	X	X	X	X		X	X	X	X	X	X
The course consists of a precourse preparation package that includes a CD-ROM outlining objectives and demonstrating surgical repair. Participants are to review exposures dealing with penetrating injuries, with commentary by experts in the field of penetrating trauma management. Participants then complete a precourse multiple choice question examination and self-efficacy test. They are then provided with a manual outlining the injuries and a critique of injury approaches with appropriate references, together with a textbook on managing specific injuries derived from writings by experts in the field of trauma (this textbook describes clinical trauma scenarios with experts' preferred surgical techniques for management of these injuries, complete with full illustrations). On the day of the course, the sessions begin with six lectures: the program's development, trauma laporotomy, liver injuries, injuries to the stomach, duodenum and pancreas, splenic injuries, genitourinary trauma and cardiac and vascular injuries. After the lecture sessions, the participants gown and glove and are introduced into a fully equipped and staffed OR. At this point the trainee-instructor ratio is 1:1. Standardized injuries are created on a live porcine model, the participant is given clinical scenarios, and then tested according to standardized criteria for their ability to identify the injury, devleop a correct treatment plan and perform the necessary repair. The faculty and trainees then evaluate the course, using questionnaires and the faculty also evaluate the trainees			X					X		X	X	
Course curriculum objectives include descibing components of state, regional and local trauma system, identifying components of an effective trauma system, describing what is necessary to prepare for local hospital's treatment of the critically injured trauma patient, outlining the components of the primary survey, decision for transfer to definitive care and the secondary survey, demonstration of the concepts of the primary survey, decsion for transfer to defnitive care and secondary survey as applied in simulated injured patient scenarios	X	X	X	X	X			X		X	X	X

Understanding surgical problems, injury patterns and issues that may result from disasters, discussion of the role that surgeons can play in planning for and responding to mass casualty incidents and disasters, especially at a hospital level, familiarization of terms and concepts of incident command, understanding the principles and challenges of disaster triage, familiarization with treatment principles related to blast injury, chemical attacks and radiological dispersal devices, knowing the civilian and military assets available for support												X
Training components include population scenarios discussion, mass casualty triage tabletop and situational training exercises, surge tabletop scenario for health care facilities, personal protective equipment skills performance and decontamination review, casualty management in small groups with simulated scenarios and emergency operations center situational training exercise. This course is the application of the knowledge obtained in the CDLS and BDLS courses.												
Pediatric assessment, airway procedures, cardiovascular procedures, pediatric specific airway, central nervous system, medical emergencies, cardiovascular system, trauma, non-traumatic surgical emergencies, special needs populations, metabolic diseases, toxicology ingestions and smoke inhalation, child maltreatment; additonal topics can be chosen from the following list: preparedness for pediatric emergencies, environmental emergencies, non-traumatic orthopedic emergencies, medical emergencies, neonatal emergencies, procedural sedation and analgesia, interface with EMS, disaster management, preparedness for acts of nuclear, biological and chemical terrorism, medical-legal considerations, mock codes, pediatric emergency radiology, advanced trauma procedures, office emergencies, rapid sequence intubation, advanced airway procedures, advanced trauma procedures, splinting procedures, wound closure procedures	X	X	X	X	X			X		X	X	X
Patient assessment, wilderness wound management, HEENT and dermatology, splinting and dislocations, cervical spine and patient movement, hypothermia wraps and patient packaging, legal issues, medical problems, avalanch, altitude illness (including pulmonary and cerebral edema), hypothermia/frostbite, hyperthermia, water purification and hydration, medical kits, lightening, animal injuries, bites and stings, dive medicine, submersion injuries, infectious disease	X	X						X	X		X	X

DISASTER paradigm (Detect, Incident Command, Scene Security and Safety, Assess Hazards, Support, Triage and Treatment, Evaluation, Recovery), natural disasters, traumatic and explosive events, nuclear and radiological events, biological events, chemical events, psychological aspects, public health implications of disasters												
Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, vascular access station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study		X	X	X	X			X		X	X	X
Pediatric assessment, respiratory emergencies, resuscitation and dysrhythmias, medical emergencies, trauma, children in disasters, emergency delivery and newboran resuscitation, children with special health care needs, child maltreatment, shock, airway skills station, spinal stabilization station, resuscitation skills station, trauma case study, cardiovascular emergency case study, medical emergency case study, child and family interaction case study, emergency delivery and newborn resuscitation case study		X	X	X	X			X		X	X	X

Scene size-up, standard precautions, patient assessment and management, trauma in pregnancy, elderly trauma, shock evaluation and management, trauma in children, head trauma, airway management, thoracic trauma, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skills stations: basic airway management, short SMR devices/emergency rescue and rapid extraction, traction splints, helmet management/log roll/long backboard, patient assessment and management	X	X	X	X				X		X	X	X
Standard precautions, scene size-up, patient assessment and management, trauma arrest, trauma in pregnancy, elderly trauma, trauma in children, thoracic trauma, head trauma, airway management, abdominal/extremity trauma, burns, spinal trauma, patients under the influence; Skill stations: basic and advanced airway management, short SMR devices/emergency rescue and rapid extrication, traction splints, helmet management/log roll/long backboard, chest decompression/fluid resuscitation, patient assessment and management	X	X	X	X	X			X		X	X	X
The didactic portion of the course includes; assessment of the pediatric patient, pediatric airway, thoracic trauma, shock and fluid resuscitation, pediatric abdominal trauma, head, spinal and extremity trauma, pediatric burns, pediatric submersion injuries, traumatic cardiopulmonary arrest, child abuse, death of a child, trauma in the newborn, and children with special health care needs; Skills stations include patient assessment and management, airway management and thoracic trauma, fluid resuscitation, spinal motion restriction and extrication, with an emphasis on pediatric immobilization devices	X	X	X	X	X		X	X		X	X	X

In addition to the didactic portion, the procedures covered include disarming the supplemental restraint system, stabilizing a vehicle on its wheels, on its roof, on its side and temporarily with improvised materials, opening a door from a hinge or bolt mechanism, removing a roof from back to front, dropping a roof from a vehicle on its side, removing the floor assembly from a vehicle, moving the steering column/wheel, moving the dash/front end, dropping the sides of a wrecked vehicle, lifting a vehicle off a patient trapped underneath, packaging the patient for removal, using a long spine board and straps or rope sling												X
In addition to the didactic portion, the skills station session covers patient assessment and management, basic and advanced airway management, spine management: short SMR devices/emergency rescue and rapid extrication, spine management, helmet management/log roll/long backboard, traction splints, chest decompression/fluid resuscitation/hemorrhage control	X	X	X	X	X		X	X		X	X	X
Recognition and treatment of infants and children ast risk for cardiopulmonary arrest, systematic approach to pediatric resuscitation, effective respiratory management, validation of skills for one-person and two-person CPR and AED skills for infants and childresn, defibrillation and synchronized cardioversion, intraosseous access and fluid bolus administration, effective resuscitation team dynamics		X	X	X	X			X		X		
Course summary includes describing the physiology and kinematics of injury, understanding the need for rapid assessment of the trauma patient, transporting patients to the appropriate medical facility depending on their injuries, advancing the level of knowledge in regard to examination and diagnostic skills, enhancing performance in assessment and treatment of the trauma patient, advancing the level of competence in regard to specific prehospital trauma intervention skills, and establishment of management methods for prehospital care of the multisystem trauma patient	X	X	X	X	X			X		X	X	X

General concepts in wilderness medicine, patient assessment system, critical systems, spine assessment and treatment , musculoskeletal, limb splinting, dislocation reduction demo and practice, skin, soft tissues and burns, thermoregulation, cold injuries, altitude, anaphylaxis, SCUBA, lightening, submersion, ALS treatment, tools and medications, appropriate technology, SAR/organization, expedition practitioner/backcountry medicine, first aid kits, toxins, bites and stings, medical legal		X	X	X	X			X			X	X
Wilderness vs. urban medicine, patient assessment, head injuries, spine injuries, shock, focused spine assessment, chest injuries, musculoskeletal injuries, spinal immobilization, medical decision making, wilderness wound management, water disinfections, small group leadership, cold and heat injuries/illnesses, lightning, altitude illness, envenomation, anaphylaxis, treating the medical patient in the wilderness, medical legal considerations and closure	X			X				X			X	X
Patient assessment system, documentation, medical legal, CPR in the wilderness, spinal cord injuries, long-term patient care, chest injuries, shock, head injuries, wilderness wound management, athletic injuries, fracture management and traction splinting, dislocations, cold injuries, heat illness, altitude illness, cardiac, respiratory and neurological emergencies, abdominal injuries, mental health emergencies, bites, stings and poisoning, allergies and anaphylaxis, diabetes, search and rescue, leadership, teamwork and communication, communicable disease, lightning, submersion, urinary and reproductive system issues, medical decision-making, common wilderness medical problems, wilderness drug and First Aid kits	X		X					X			X	X

Patient assessment, management of life threats and scene safety, management of head, spine and musculoskeletal injury with minimal equipment, heat and cold emergency management, understanding of the limits and utility of ALS in the wilderness, preparation and packing of medical and personal gear, organization, leadership and participation in a simulated wilderness evacuation, emergency and extended medical care appropriate to a remote wilderness setting using available resources, appropriate attire for different conditions, food preparation using field rations and propane stove, performance of leave-no-trace skills, proficiency in expedition's mode of travel, expidition behaviors (teamwork, group decision making support, positive attitude during diversity), leadership skills, demonstration of sound judgement and decision making								X			X	X
Role of expedition medical officer, patient assessment, lifting and moving patients, litter packaging, immobilization and carrying techniques, medical legal issues in remote care, lightning, hypothermia, frostbite, heat illness, trauma review and long term considerations, long term wound care, stapling and suturing, athletic injury management and taping, joint reductions, fracture management, spinal injury assessment and management, medical emergencies in remote settings, eye injuries, dental emergencies, search and rescue, survival lab, expedition health and hygiene, gender medicine, psychological emergencies, tropical medicine and travel considerations, altitude illness, dive emergencies, animal attacks and envenomations, evacuations and rescue considerations, mass casualty/triage exercise, expedition/remote site medical kits and clnics	X	X	X	X	X			X	X		X	X

Role of the medic in the remote area, patient assessment, lifting and moving patients, medical legal issues in remote care, hypothermia, frostbite and non-freezing cold injuries, heat illness, altitude illness, dive emergencies, animal attacks and envenomations, tropical medicine and travel considerations, expedition health and hygiene, CPR for the healthcare provider, airway management, IV therapy, kinematics of trauma, shock and fluid replacement, spinal injury assessment and management, litter packaging, imobilization and carrying techniques, extrication techniques, head injuries, thoracic trauma, mass casualty/triage, abdominal trauma, thermal trauma, soft tissue injuries trauma lab, essentials of prehospital care, athletic injury management and taping, dislocation management, fracture management, geriatric considerations, pediatric considerations, primary care/sick call, eye injuries, gender medicine, pain management, dental emergencies, psychological emergencies, acute abdominal illness, search and rescue, survival lab, medical emergencies, expedition/remote site medical kits and clinic	X	X	X	X	X		X	X	X	X	X	X
Differentiating between high-risk and convential medicine, top causes of preventable death in high-risk scenarios, identifying and treating life-threatening injuries, high-threat extraction techniques, mass casualty incidents, wound closure, lifting and moving patients, tourniquet application, basic airway management, shock, thoracic trauma, head injuries, musculoskeletal injuries, fractures and blast injuries	X	X	X	X				X			X	X
The course teaches an effective approach to patients presenting with a wide range of illnesses and injuries including trauma, cardiac, strokes, pediatric, obstetric, neonatal, airway compromise, sepsis, and neurological conditions	X	X	X	X	X		X	X		X	X	X

The course consists of seven different blocks of instruction each lasting twenty-five working days. The blocks are structured to progress a student from having no medical background to performing and understanding acute life-saving interventions in 36 weeks.	X	X	X	X	X		X				X	X
Medical Fundamentals (7weeks), SOCM Trauma Modules (7 weeks), Clinical Internship (4 weeks), Military medicine (3 weeks)		X	X	X	X		X				X	X

Week One: Week one covers refresher training for PALS, ACLS, BLS, TCCC, and some "hands on" emergency training. Week Two: Covers Basic Trauma Skills, PHTLS Review, WMD, Environmental emergencies, Field Training Exercise, and General Medicine.	X	X	X		X			X		X		

The course is divided into 2 phases. Phase I is the Special Operations Combat Medic (SOCM) - course. Students are Ranger Medics, Recon(NEC 8427), SEAL(NEC 5392), and SBU(NEC 5392) students (6 months in length). Phase II is the SFMS/SOIDC – referred to as “The Long Course” (1 year in length to include SOCM). Usually Navy Recon students will return to complete the SFMS/SOIDC portion after a successful tour with an operational unit. The course consists of 5 academic modules: Laboratory Subjects, Veterinary Medicine, Surgery, Anesthesia, Records and Reports (SARR), a 24 day Special Operations Clinical Training rotation, and Special Forces Medical Sergeant Roles and Responsibilities. From start to finish, SFQC for a Special Forces Medical Sergeant lasts 60 weeks, including actual medical training of about 15 weeks.	X	X	X	X	X		X	X			X	

Surgeon briefings from USSOCOM and Service Components, CSO, State Department, ASD/SOLIC (SSTR), and NGOs; SOF functional and regional briefings to include; CA, JSOTF C2, JPRA, EPW issues, Interagency Collaboration, USSOCOM Care Coalition, Medical Training, Logistics and Intelligence.												
This one-week course is comprised of lectures and syndicate work which result in syndicate presentations. Day 1 provides a broad overview of NATO structures and its operational and medical support planning processes. Day 2 focusses on NATO comprehensive operational planning directive (COPD) and the NATO operational planning process (OPP) with an emphasis on how Medical Support planning contributes to them. Day 3 concentrates on supporting operations in different environments and special planning considerations. Day 4 and 5 are syndicate-focused with an emphasis on developing and presenting a concept of operation for medical support within a joint multinational operation.												

Phase 1 (16 months, didactic): Freshman term: (course name - semester hours): Anatomy and Physiology I - 7 Biochemistry - 3 Microbiology - 5 Clinical Laboratory - 4 Medical Law and Ethics - 2 Research Evaluation - 2 Sophomore term: Anatomy and Physiology II - 7 Pathology - 3 Pharmacology I - 3 Radiology - 2 Psy Psychiatry - 3 EKG - 2 Endocrinology - 2 Military Publich Health and Dental - 2 Patient Evaluation I - 3 Junior term: Orthopedics - 4 Pulmonary - 2 Gastroenterology - 2 Cardiology - 4 Clinical Correlations I - 1												

Phase 1: online self-paced study, building on material and skills gained through military schooling and experience. Phase 2: clinical rotations and practicals provided at/near T1G Memphis. Phase 3: testing of practical skills and written test for final certification.												

Phase 1: high angle rescue. Phase 2: confined space/collapsed structure and vehicle extrication. 4-6 hours didactic followed by hands on practice.												
BLS, ACLS, PALS, PHTLS, dental emergencies, dental anesthesia with lab, regional anesthesia and lab, environmental emergencies (heat, cold, HAPE, HACE, MS, diving), exam and diagnosis of common musculoskeletal injuries with lab, medical mission planning, mass casualty management, medical bag packing, casualty evacuation and lab (military oriented platforms), advanced suturing techniques with lab, examination and diagnosis of somatic disorders (manual medicine) with lab, behavioral emergencies, complications of geriatrics, trauma patient assessment/treatment/management with lab, trauma skills practical vivarian lab.												
General principles of nursing practice (transport physiology, scene operations, communications, safety and survival, management of man-made disasters, professional issues, management), Resuscitation principles (principles of assessment and patient preparation, airway management, mechanical ventilation, perfusion), trauma (principles of management, neurologic, thoracic, abdominal, orthopedic, burn, maxillofacial and neck), Medical emergencies (neurologic, cardiovascular, pulmonary, abdominal, electrolyte disturbances, metabolic and endocrine, hematology, renal, infectious and communicable diseases, shock, environmental and toxicological emergencies), Special populations (obstetrical patients, pediatric trauma and medical patients, geriatric trauma and medical patients, bariatric patients)	X	X	X	X	X		X	X		X	X	X

Preparatory topics: concepts and components of critical care, air medical considerations, transport physiology, lab data, basic radiographic interpretation, peripheral and central lines, hemodynamic monitoring, blood administration; Medical topics: respiratory, advanced airway, mechanical ventilation, pharmacology (neuro system), cardiology, 12-lead EKG interpretation, circulatory pharmacology, sepsis/MODS, gastrointestinal, renal urological, neuro/ICP, endocrinology, hematology; Trauma: burn and trauma care; Special populations: pediatrics, high risk obstetrics, fetal heart monitoring		X	X	X	X		X	X		X		
General Principles of AHLS: hazardous materials epidemiology, important properties of hazardous materials, medical mangement of hazmat victims; Toxic inhalations: irritant gases, asphyxiants, antidotes (normobaric oxygen, hyperbaric oxygen, methylene blue, amyl nitrite, sodium nitrite, sodium thiosulfate, hydroxocobalamin; Insecticide poisoning: organophosphate and carbamate insecticides, antidotes (pralidoxime, atropine); Scenarios (tabletop exercises); Corrosives, hydrocarbons and substituted hydrocarbons; Miscellaneous toxicants; hydrazines, antidote (pyridoxine), hydrofluoric acid, antidote (calcium gluconate, calcium chloride); Toxic terrorism: an introduction to chemical, biological, radiological and nuclear terrorism, chemoterrorism - nerve agents, bioterrorism, radiation emergencies; additional tabletop exercises, mandatory exam												X

Day I Skills Lab Vital Signs, Oxygen use and set up, Airway clearance and BVM support, NC/NRBM, OPA, NPA, Suction, Sterile Gloves, Foley, NG/OG, Vaginal Delivery, Suture/Staples insertion and removal, Patient Positioning/turning/nursing skills, Oral care/ wound care Day II Skills Lab IV Insertion and removal, IV maintenance drips, IV Push , Cric insertion/removal, Intubation, Patient Scenarios Day III Classroom Acute Renal Failure/Acute Kidney Injury, ARDS, PEEP, SEPSIS, Pharmacology, Nursing Skills, Burns, Ventilator/Suction use (Memo generating CME credit provided) ICU Rotation: This will be a culminating event rotating through ICU/ER/Wards at Womack to employ skills learned and shadow nursing staff for patient care.												

12-18 hour hands=on exercise in a deployed scenario												

X	X		X		X	X	X	X		X	X		X	X	X		X		
				X		X				X									
	X	X	X	X		X	X			X	X		X						
		X	X	X		X	X			X	X		X	X					

X	X					X				X	X	X	X	X	X		X		
				X						X			X	X	X				

								X					X	X	X				
			X				X			X					X				X
			X	X			X	X					X	X	X				X
								X	X	X		X		X	X		X	X	X

			X		X		X	X		X			X	X			X		X

								X		X	X	X			X				X
X		X	X				X		X		X	X			X				

				X	X	X									X				
X				X	X	X							X		X				

X				X	X	X									X			X	X
					X														

	X	X	X	X			X				X	X	X		X				

				X	X	X		X					X	X					X
X			X	X	X	X	X												X
	X														X				

									X			X					X		
	X								X			X					X	X	X

																			X

			X	X															

X	X		X	X	X	X	X	X		X		X	X	X			X		X
													X		X			X	
				X	X	X		X					X						

				X		X	X												
				X		X													
X	X		X	X	X	X	X	X					X						X
X	X			X	X	X		X											

				X		X													X
X	X			X	X	X		X					X						X
X	X			X	X	X		X					X						X

				X		X													
	X		X	X	X	X	X	X					X	X					X
	X		X	X	X	X	X	X					X	X					X
	X		X	X	X	X	X	X					X	X					X

				X		X		X											
X	X			X	X	X		X					X	X					
				X	X	X							X						
	X			X	X	X		X					X						X

X	X	X	X	X	X	X	X	X					X						
	X			X		X		X					X						
X	X	X		X	X	X		X					X	X					

	X			X		X		X					X						
X	X	X		X	X	X		X					X						

X	X	X	X	X	X	X	X	X					X	X					X
	X			X		X							X	X	X				
X	X	X		X	X	X		X					X						X

X	X	X		X		X			X	X		X	X	X	X			X	X
X		X		X	X	X				X					X				X

	X	X	X	X			X	X		X	X		X	X	X	X			

X		X	X	X	X	X	X	X		X			X		X		X	X	X

X	X	X	X	X	X	X	X	X					X	X					X

X			X	X	X	X	X							X					X
				X		X													

Combat Casualty Care

Operational Competency Development for Role 3 and below

Revised: 24 May 2018

Note: Basic nursing competencies will be documented on appropriate clinical Competency Assessment Tool (CAT): Universal Nursing CAT, Intensive Care Nursing CAT, Emergency Nursing CAT, Surgical Services CAT, Medical-Surgical CAT

Name ______________________________ Start Date_______ ____Completion Date____________

Contents

Dates of Required Training Attendance or Completion:

Category-1 Clinical Currency for Readiness –Fundamental training and skills, usually obtained through medical education and in-garrison care that form a foundation on which to build readiness skills. (As applicable)	Service-Specific platform exercise/training (within 12 months of deployment)
Universal CBO Form ______________	Army Trauma Training Detachment (ATTD) rotation ________________
Unit Specific CBO ________________	Navy Trauma Training Course (NTTD) _______________________
Med/Surg ________________________	Critical Care Air Transport Team Course (CCATT) __________________
ICU _____________________________	Center for Sustainment of Trauma and Readiness Skills (C-STARS) ____________
Emergency Dept. __________________	Other____
Surgical Services__________________	Joint En Route Care Course (JECC) _____________________
BICU ___________________________	Tactical Combat Casualty Care (TCCC) (every __ years) ______________
Total clinical hours 12 months prior to deployment (see last page)	Trauma Nursing Core Course (TNCC) (every __ years) _______________ OR
________________/40 hrs minimum	Advanced Trauma Care for Nurses (ATCN) (every __ years) _________________
	Advanced Cardiac Life Support (ACLS) (every __years) ___________________
	Pediatric Advanced Life Support (PALS) (every __years) ____________________
	Other____
	Field Exercise (Describe) ____

Name____Date _______________

CPG Review (April 2018: from 44 Core CPGs; 6 PFC CPGs; 4 CCATT CPGs)

	Completed	Date	
Required CPGs **https://jts.amedd.army.mil/index.cfm/PI_CPGs/cpgs**			
Acute Extremity Compartment Syndrome-Fasciotomy Extremity War Wounds			
Acute Respiratory Failure			
Amputation Evaluation Treatment			
Battle Non-Battle Injury Documentation Resuscitation Record			
Burn Care			
Cervical Thoracolumbar Spine Injury Evaluation Transport Surgery Deployed Setting			
Damage Control Resuscitation			
DCoE Concussion Management Algorithm Cards			
Fresh Whole Blood Transfusion			
Hypothermia Prevention Monitoring Management			
Infection Prevention in Combat-Related Injuries			
Intra-theater Transfer Transport of Level 2 Level 3 Critical Care Patients			
Management of War Wounds			
Nutritional Support Using Enteral Parenteral Support			
Pain Anxiety Delirium			
Pelvic Fracture Care			
Use of Electronic Documentation CENTCOM AOR			
Ventilator Associated Pneumonia			
JTS Webpage Required https://jts.amedd.army.mil/index.cfm/documents/forms_after_action			
Resuscitation Record Form & Instructions			
TCCC Casualty Card			
TCCC Guidelines			
Recommended CPGs **https://jts.amedd.army.mil/index.cfm/PI_CPGs/cpgs**			
Airway Management Traumatic Injuries			
Military Working Dogs Clinical Management			
Prolonged Field Care/CCAT series as applicable			
REBOA for Hemorrhagic Shock			
Unexploded Ordnance UXO Management			

Name____Date ________________

Equipment Familiarization (Document type(s) where applicable

- ☐ Portable monitor:________________________________
- ☐ Triple channel IV pump:________________________________
- ☐ PCA pump (e.g., AMBIT Pain Pump):___________________________
- ☐ Field ventilator: ____________________________________
- ☐ Field suction device: ____________________________
- ☐ Portable lab equipment (e.g., IStat machine) ____________________
- ☐ Rapid infuser / fluid warmer (e.g., Level 1/Belmont Rapid infuser)________________________
- ☐ Wound vacuum (e.g., KCI wound vac):________________________
- ☐ Chest tube drainage system - Adult/pediatric (e.g., Atrium):_____________________
- ☐ Warming devices:_______________________________
- ☐ Intracranial pressure monitoring device & intraventricular drainage device:____________________
- ☐ NATO litter
- ☐ ____
- ☐ ____
- ☐ ____

<u>Key Resources:</u>

- Joint Trauma System Clinical Practice Guidelines https://jts.amedd.army.mil/index.cfm/PI_CPGs/cpgs
- Tactical Combat Casualty Care Guidelines (TCCC) for Medical Personnel - http://www.usaisr.amedd.army.mil/pdfs/TCCCGuidelinesforMedicalPersonnel170131Final.pdf
- Elsevier Clinical Nursing Skills. https://lms.elsevierperformancemanager.com/ContentArea/NursingSkills
- American Association of Critical-Care Nurses (AACN) AACN Core Curriculum for High Acuity, Progressive, and Critical Care Nursing, 7th Ed. (2017) T.M. Hartjes, Ed. Elsevier.
- Battlefield and Disaster Nursing Pocket Guide, 1st Edition (2008) Jones and Bartlett Publishers
- Emergency War Surgery,4th ed, 2013, Borden Institute
- "Deployed Medicine" mobile application and website, Defense Health Agency https://www.deployedmedicine.com/

Name____Date _______________

FORM DIRECTIONS

Each individual is responsible and accountable for their learning, professional practice and final performance validation.

These competency documentation tools outline the overall performance goals, critical elements of practice, and the learning resources that are available for preparing for deployment. Refer to Medical Surgical, Emergency, Surgical Services, and Critical Care Nursing Competency Assessment Tools for core clinical competency skills requirements.

Self-Assessment: , Use the first column and the scoring key below to self-assess your areas of experience vs. skills that need additional practice (or review/study of Clinical Practice Guidelines). This process will help to identify the areas where you need additional experience, access to teaching resources, instructor support or deliberate practice.

Scoring Key

1 – Identified Limitation	requires direct guidance & support, little or no experience with skill, procedure, or function
2 – Capable	familiar with skill/equipment but may need assistance, seeks help when unfamiliar with process/skill
3 – Performs independently	knowledgeable to perform these tasks safely as a result of training and experience
4 – Proficient	extensive experience in this area/skill, able to teach and mentor others
5 – Expert	all of the above; fluid performance; ensures evidence-based practice for clients, team & organization

VALIDATOR INSTRUCTIONS

COMPETENCY VALIDATION: Competence is a synthesis of skill, knowledge, and performance. The ability to transform learning into effective and relevant action is evidence of such competence.

Demonstration or verbalization of care & judgment verifies competence as documented within this form.
Demonstration - performs task/procedure in safe, capable manner within simulations, lab setting, skills stations, and/or direct care.
Verbalization - explains process and/or planning that evidences safe, reliable knowledge base and planning for care within case scenarios, discussion, and description of plan.

- "Self-assess" column: is for self-assessment of capability. This information contributes to planning of goals, activities, experiential learning needs and patient assignments. Preceptors and/or educators review the self-assessment to determine individualized learning goals and plan the direct care experiences.
- Post Assessment column: Following orientation or training, the trainee and preceptor will collaboratively provide a post-assessment. Bold performance elements must be rated "competent" for independent practice.

  Note*: Competency for R3 requires a score of at least 2; Role 2 competency requires a score of at least 3. (*Scoring key above)
- Comments column: Add pertinent comments if indicated by learning needs or excellent performance
- Non-Applicable objectives: Record N/A and initials for items that do not apply to to role or performance.
- Final column for PRECEPTOR or INSTRUCTOR USE: Date and initials in this column confirm that the validator has observed safe and effective care, delivered according to all pertinent protocols, on the indicated date.

Signing in this column verifies a score of ≥ 2 "Capable", for the indicated aspect of care for a Role 3; **≥ 3 "Performs Independently" is required for a Role 2 (refer to key above).** Completion and filing of this form indicates completion of orientation/transition as well as verification of the nurse capability in the clinical setting and role expectations.

Name____Date ______________

1. Establishes effective environment of care for unique deployed setting

Learning strategies: *Elsevier learning modules apply to selected tasks & procedures throughout this tool.*

Clinical Practice Guidelines (CPGs) and training for roles, aspects of patient care, equipment management, and management role for establishing environment of care, MASCAL, triage, walking blood bank, anesthesia, sterilization, surgery, etc.

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Employs equipment and/or resources as needed				
• Point of Care Testing devices: iSTAT, other				
• Field/transport IV pumps: comment on type(s)				
• Body warmers				
• Rapid infuser/ fluid or blood warmers				
• Transport ventilator: comment on type(s)				
• Negative pressure wound device				
• Field suction device				
• Vital signs monitor: comment on type(s)				
• Traction maintenance				
• External fixation devices				
• C-spine stabilization devices: comment on types				
• Other as applicable				
Initiates advanced trauma life support protocols				
Engages local trauma system, MASCAL Triage and Response				
Method: Simulation				
Intracranial pressure monitor				
Ventriculostomy drain				
Tong and Halo set up and management				
Tourniquet use and care				
Other as applicable (e.g., Anesthesia/sterilization)				
Manages a "walking blood bank" protocol				
Completes documentation including current theater requirements for written and electronic systems				
Method: Testing/knowledge				
Adheres to CPGs for the current theater of operations				
Applies stress control/resiliency concepts to assess patients, peers, unit, and self				
Applies CDC Emergency Preparedness and Response				
Describes capabilities associated with combat Roles of Care				

Name____Date ________________

2. Maintains trauma unit workflow & patient management in urgent and mass casualty conditions

Learning Strategies:

JTS Clinical Practice Guidelines - Battle and Non-Battle Injury Documentation: The Resuscitation Record; Management of Pain, Anxiety and Delirium; Selected Clinical Practice Guidelines as per injury type http://www.usaisr.amedd.army.mil/cpgs.html

Battlefield and Disaster Nursing Pocket Guide: Primary/Secondary Assessment and Blast Injury; Pain Management Epidural analgesia; Care of the Combat Amputee (2009) Review Ch 11. Pain management among soldiers with amputations. http://www.bordeninstitute.army.mil/ published _volumes/amputee/CCAchapter11.pdf

Triage: *Epidemics After Natural Disasters: CDC Epidemics After Natural Disasters Article (Jan 2007)*

Military Medicine in Humanitarian Missions: Military Medical Ethics Vol 2 chapter 24

Borden Institute: Combat Casualty Care Red Cross Mass Disaster Response (Select an event then preparedness tab for info)

AE Guidance Policy Letter: Management of Analgesia & PNB Catheters

	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Performs initial triage & assessment of each patient				
Prioritizes care for a multiple trauma patient using focused, primary, secondary and head to toe re-assessments				
Performs trauma resuscitation				
Safely transfers patient on/off NATO litter				
Integrates relevant laboratory/diagnostic test and monitoring findings: SaO_2, SpO_2, PaO_2, FiO_2, $ETCO_2$, arterial/venous blood gases, hematology, electrolytes, end-organ function				
Manages pain, anxiety & delirium for variety of patients, including pain management via epidural catheters				
Monitors effect of administered analgesics, including IV morphine, fentanyl, and dilaudid.				
Administers pain medications via pumps				
Provides care for patient with nerve block				
Implements therapies to prevent acute kidney injury associated with rhabdomyolysis/shock				
Considers potential Multi-Organ Dysfunction Syndrome				
Method: Simulation				
Performs infection prevention and control measures appropriate for austere environment				
Method: Testing/Knowledge				
Appropriately triages and provides care for Chemical-Biologic-Radiologic-Nuclear casualties				
Explains issues, indications, and management of epidemics following disaster				
Describes military medicine's role in humanitarian missions				

Name____Date ________________

3. Triages and manages patients that present with Combat Wounds

Learning Strategies: Blast Injury Fact Sheet: http://www.bt.cdc.gov/masscasualties/blastinjuryfacts.asp; *Battlefield and Disaster Nursing Pocket Guide* - Blast injury; Soft Tissue Trauma; Wound Care; Amputation; Negative Pressure Wound Therapy; Hypothermia Treatment; Transport and Transfer Checklist Borden Institute - Combat Casualty Care: Lesson Learned from OEF and OIF;	Tactical Combat Casualty Care: Bleeding - Videos: CAT (One/Two Handed Application) JTS Clinical Practice Guidelines -Hypothermia prevention; Infection Control; Management of War Wounds; Amputation Everyday work experience validated by supervisor/instructor; In-service. Additional sources: AECOT; AE Concepts; or UTC specific courses Reference for training topics: AFI 41-307, *Aeromedical Evacuation Patient Considerations and Standards of Care*

Critical elements of performance	Assessment Self	Assessment Post	Comments	Sign-off/ Date
Method: Clinical experience preferred (Comment if other)				
Evaluates multi-system disorders to identify and appropriately respond to potential or actual life-threatening multi-system crisis				
Identifies and responds to potential or actual life-threatening musculoskeletal or vascular emergencies				
Manages patient with penetrating/trauma: gunshot wound, blast projectile, contamination				
Applies pressure dressing to address vascular compromise				
Manages patients with respiratory insufficiency/failure and pulmonary pathology				
Maintains optimal core temperature with use of multi-modal hypo/hyperthermia prevention				
Establishes vascular access/line: set-up, line care, mgmt., lab draws				
Cares for patient with open and closed wounds				
Performs initial and ongoing wound care that includes negative pressure wound dressings				
Implements preventive measures for potential skin breakdown				
Performs isolation for multidrug resistant organisms				
Provides appropriate nutritional support				
Transports Med/Surg patient with proper packaging, monitoring and communication for both intra & inter facility transport				
Performs post-mortem care				
Method: Simulation				
Manages a Med/Surg/Pediatric patient with blast injuries and /or traumatic wounds				
Controls fluid balance with initiation and maintenance of intraosseous device				
Administers ACLS/emergency drugs: analgesics, antiarrhythmic, anxiolytics, beta blockers, calcium antagonists, inotropes, paralytics, sedatives, vasodilators, vasopressors				
Method: Knowledge base				
Recognizes signs/symptoms of vascular occlusion or compromise				

Name____Date _____________

4. Provides damage control resuscitation (DCR) for bleeding patients

Learning Strategies: Tactical Combat Casualty Care Guidelines (TCCC): Bleeding

Battlefield and Disaster Nursing Pocket Guide: Tourniquet; Hemostatic dressings

JTS Clinical Practice Guidelines - Massive Transfusion; Transfusion CPGs: Fresh whole blood transfusion; Frozen Blood

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Provides immediate and continual assessment and interventions to stabilize and manage patients with shock/multi-organ dysfunction				
Manages fluid resuscitation/volume reduction in support of shock management				
Administers whole blood, component blood products, and calcium based on the JTS CPGs, to include: donor selection, blood warming, and calcium monitoring				
Administers Tranexamic Acid (TXA), within the optimal (<3 hrs post injury) window				
Method: Simulation				
Intervenes appropriately for patient undergoing aortic balloon placement (REBOA)				
Method: Testing/Knowledge				
Verbalize the factors that can help predict the need for a massive transfusion				
Verbalizes the types of patients that can benefit from hypotensive resuscitation and contraindications				
Verbalizes the order of priority for fluid resuscitation products and justification for limited crystalloid/colloid usage when possible				
Verbalizes the importance of administering blood products in a 1:1:1:1 ratio				
Explains appropriate interventions for abnormal ABGs, cardiac enzymes, CBC, coagulation panels, electrolytes				

Name____Date ________________

5. Engages surgical support services as indicated for patient needs

Learning Strategies:

JTS Clinical Practice Guidelines

- Infection Control; Management of War Wounds; Amputation

Battlefield and Disaster Nursing Pocket Guide:

- Soft Tissue Trauma; Wound Care; Amputation; Negative Pressure Wound Therapy

Critical elements of performance	Assessment Self	Assessment Post	Comments	Sign-off/ Date
Method: Clinical experience preferred (Comment if other)				
Prepares patient for surgical interventions				
Establishes sterile surgical environment; applies principles of field sterilization processes				
Assists anesthetist with patient management and anesthesia				
Ensures safe, surgical environment for patient – including: cautery, immobilization, positioning, instrument/sponge counts, etc.				
Provides instruments and supplies as indicated for surgery				
Recovers patient from anesthesia				
Monitors for hemostasis with vascular injury				
Stabilizes the hemodynamically unstable patient,				
Provides pre- and post-surgery care for damage control surgery				
Utilizes ASPAN (American Society of Peri-Anesthesia Nurses) guidelines for peri-operative patient care and management				
Cares for patient receiving: moderate (conscious) sedation, deep sedation, general anesthesia, or epidural anesthesia				
Administers analgesics, including: IV morphine, fentanyl, dilaudid				
Administers sedatives including propofol, midazolam, ketamine				
Administers neuromuscular blockade				
Determines when patient meets PACU discharge criteria				

Name____Date _______________

6. Preserves optimal function for patients with severe limb injuries, amputation, compartment syndrome and fasciotomy.

Learning Strategies:	*Battlefield and Disaster Nursing Pocket Guide:*
JTS Clinical Practice Guidelines • Compartment Syndrome and Fasciotomy • Pelvic Fracture Care • Amputation	• Rhabdomyolysis; Crush Injuries; Compartment Syndrome TCCC Guidelines: Bleeding Video: Combat Gauze PPT: Tactical Field Care

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Appropriately positions injured extremities to optimize tissue perfusion and function				
Verbalizes the signs and symptoms of deep vein thrombosis/pulmonary embolism				
Evaluates for extremity compartment syndrome with physical assessment, intra-compartment pressure monitoring				
Performs cleaning, irrigating, culturing, and dressing of an open wound				
Performs wet to moist dressings and wound packing				
Performs external fixator pin care				
Optimizes care for patient with peripheral nerve block				
Cares for patient with musculoskeletal injuries and amputations: rhabdomyolysis, external fixators, wounds/dressings, doppler devices				
Assesses patients with high bilateral amputations for genito-urinary/rectal injuries				
Engages appropriate crush injury protocols with specific evaluation for acute kidney injury and electrolyte imbalance				
Provides care for orthopedic injuries: fractures, dislocations, surgical or traumatic amputation				
Method: Simulation				
Initiates compression, hemostatic dressing or tourniquet to control hemorrhage				
Maintains traction and stabilization devices for fractures (e.g. splints, fixators, traction, etc.)				
Manages patient with junctional tourniquet: upper and lower extremity				
Method: Testing/Knowledge				
Explains therapies for acute fluid and electrolyte abnormalities associated with Rhabdomyolysis				
Describes appropriate response to increased 'compartment syndrome' pressure				

Name____Date ________________

7. Addresses issues inherent to effective burn care and airway management

Learning Strategies:

JTS Clinical Practice Guidelines - Hypothermia prevention; Burn Care

Battlefield and Disaster Nursing Pocket Guide: Hypothermia Treatment; Burn Care

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Performs initial management and stabilization of a burn patient including burn resuscitation and fluid management				
Calculates burn size and depth of injury accurately using Lund Browder chart, Rule of Nines, Rule of Palms				
Performs burn wound management with use & discussion of various topical agents/dressings				
Delivers fluid requirements for burn resuscitation as calculated based on Rule of 10s, fluid titration, & 24 hr maximum fluid volume				
Prevents hypothermia				
Manages pain, anxiety & delirium for burn-injured patients				
Recognizes emergent burn syndromes including eschar and extremity/abdominal compartment syndromes				
Performs abdominal compartment monitoring				
Manages a patient with inhalation injury				
Performs basic and advanced airway management				
Assists with endotracheal intubation, including rapid sequence induction				
Evaluates indices of effective oxygenation				
Administers nebulizer therapy				
Assesses patient tolerance of ventilator liberation/weaning				
Performs tracheostomy care and suctioning				
Manages patient care requiring airway adjuncts, artificial airways, continuous pulse oximetry and oxygen/nebulizer delivery				
Manages continuous end-tidal CO2 monitoring, oxygenation, and mechanical ventilation				
Method: Testing/Knowledge				
Describes treatment for a chemical agent casualty				
Describes treatment for an electrical injury casualty				

Name____Date ________________

8. Stabilizes patients presenting with cervical and/or spine injury

Learning Strategies:	Battlefield and Disaster Nursing Pocket Guide:
Directive-Type Memorandum (DTM) 09- 033, "Policy Guidance for Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting Cervical and Thoracolumbar Spine Injury Cervical Spine Evaluation & Non-Surgical Management JTS Clinical Practice Guidelines - Initial Care of Ocular and Adnexal Injuries	• Neurological • Spinal Immobilization/ Cervical Collar Application • Neurological Assessment • DVBIC TBI Screening Tool • Military Acute Concussion Evaluation • Heat Related Injuries • Ocular injuries

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Monitors for cognitive and behavioral changes				
Performs a complete neurological assessment on all patients with a suspected spinal injury				
Documents serial assessment of peripheral perfusion, extremity movement				
Ensures adequate respiratory function				
Maintains head/neck positioning, log rolling & spine precautions				
Stabilizes cervical spine; manages spinal immobilization device (e.g. vacuum spine board, cervical collar)				
Competes the documentation for C-Spine clearance (JTS C-Spine Clearance Sheet or DD Form 3019)				
Assists with lumbar puncture				

Name____Date ______________

9. Manages patient presenting with severe head and/or neck injury

Learning Strategies:	*Battlefield and Disaster Nursing Pocket Guide*:
JTS Clinical Practice Guidelines • Directive-Type Memorandum (DTM) 09- 033, "Policy Guidance for Management of Concussion/Mild Traumatic Brain Injury in the Deployed Setting • Initial Care of Ocular and Adnexal Injuries	• Neurological o Spinal Immobilization/. Cervical Collar Application Neurological Assessment • DVBIC TBI Screening Tool • Military Acute Concussion Evaluation • Ocular injuries

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Manages patient with neurological insult or injury, including concussion, cerebral hemorrhage, or traumatic brain injury				
Interprets Glasgow Coma Scale assessment				
Identifies signs and symptoms of traumatic brain injury				
Tracks changes that may indicate increased intracranial pressure				
Evaluates closed head injury/trauma, open/skull fracture				
Implements nursing measures to minimize secondary brain injury: environmental control, blood pressure sustainment, oxygenation, positioning, and temperature management				
Manages neurologic drainage and pressure monitoring system with appropriate positioning and management of drain during transport or other aspects of care				
Evaluates for subarachnoid hemorrhage / aneurysm rupture				
Considers care unique to nasal, orbit or jaw fracture, and epistaxis				
Identifies risks associated with airway management with maxillofacial trauma				
Identifies patients at risk for otologic blast injury				
Considers potential for neurogenic shock				
Provides eye protection with suitable shield/dressing				
Evaluates for foreign body in the eye or globe rupture				
Manages lacerated or ruptured globe				
Method: Simulation				
Removes protective helmet while protecting spine, skull and injury				

Name____Date ______________

10. Ensures stabilization of patient with thoracic trauma or vascular injury

Learning Strategies:

Closed Chest Drainage System, Needle Thoracostomy,
AACN Procedure Manual for Critical Care, 6th Ed.
TCCC Guidelines: Breathing Slides: Tactical Field Care

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Manages hemodynamic monitoring (invasive arterial pressure and CVP monitoring, CO determination, fluid resuscitation)				
Interprets hemodynamic waveform monitoring				
Evaluates chest or pulmonary system injuries				
Evaluates for possible Pulmonary/thoracic trauma or toxic inhalation (chlorine, hydrofluoric acid)				
Manages patient with open/tension pneumothorax/ hemothorax				
Considers differential diagnosis including cardiac trauma, aortic aneurysm/dissection, cardiac tamponade, and great vessel injury				
Manages the patient requiring thrombolytic therapy				
Stabilizes patient with transcutaneous or venous pacing				
Supports Advanced Cardiac Life Support interventions				
Assists with insertion and management of closed chest drainage				
Method: Simulation				
Correctly performs needle thoracotomy for decompression of tension pneumothorax				
Method: Testing/Knowledge				
Explains the role of resuscitative thoracotomy				
Recognizes signs/symptoms of blast lung injury				

Name____Date _____________

11. Stabilizes and manages the abdominal trauma patient

Learning Strategies:

JTS Clinical Practice Guidelines - Urologic Trauma Management; GI trauma

Battlefield and Disaster Nursing Pocket Guide: Rhabdomyolysis; Crush Injuries; Renal trauma

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Provides appropriate response for gastrointestinal trauma or emergencies				
Identifies patients at increased risk for intra-abdominal hypertension/abdominal compartment syndrome				
Stabilizes patients with trauma, acute abdomen, GI bleed, hepatic failure, open abdominal wounds, pancreatitis				
Determines the potential for large vessel injuries				
Assessment includes consideration of pelvic fracture and appropriate interventions and management				
Recognizes signs indicative of genitourinary/renal trauma				
Evaluates for signs of bladder rupture				
Method: Simulation				
Manages suprapubic catheter				
Manages patient with pelvic binder				
Manages patient with open abdomen following damage control laparotomy				
Method: Testing/Knowledge				
Explains contraindications to placement of urethral/bladder catheter				

Name____Date _______________

12. Provides care for unique injuries and populations, including but not limited to behavioral health, pediatrics, OB/GYN, Unexploded Ordinance Management

Learning Strategies:	
Pediatric Advanced Life Support (PALS) course *Battlefield and Disaster Nursing Pocket Guide*, • General pediatric considerations • Pediatric - medications • Pediatric vital signs • Pediatric fluid resuscitation • Pediatric burn fluid resuscitation • Pediatric pain/sedation management • Neonatal – immediate care of newborn • Neonatal resuscitation • Pediatric – stresses of flight	Borden Institute: Pediatric Surgery and Medicine in Harsh Environments http://www.dcoe.health.mil/PsychologicalHealth/Provider_Resources.aspx Deployment Health Clinical Center: Combat Operational Stress http://www.pdhealth.mil/op_stress Joint Professional Military Education Psychological Health Training Manual JPME Psychological Health Training Manual Defense Center of Excellence for Psychological Health for Psychological Health and Traumatic Brain Injury (“For Providers”) JTS Clinical Practice Guidelines: Military Working Dogs Clinical Management; UXO Management;

Critical elements of performance	Assessment		Comments	Sign-off/ Date
	Self	Post		
Method: Clinical experience preferred (Comment if other)				
Implements an age and culturally appropriate pain, sedation, and delirium management plan				
Provides appropriate support and safe environment for patients suffering from psychiatric disorders				
Assesses age-related needs of pediatric patients pediatric/geriatric: emergencies, IV access, fluid and medication administration, airway/ventilation management, and I/O monitoring				
Method: Simulation				
Administers pediatric and/or neonatal Life Support				
Describes key principles of clinical management of Military Working Dogs				
Method: Testing/Knowledge				
Addresses cold-related emergencies (hypothermia, frostbite)				
Treats heat related emergencies (heat stroke/exhaustion)				
Applies appropriate care for submersion incident				
Treats systemic envenomation emergencies (spiders, snakes, marine)				
Manages a patient requiring forensic evidence collection				
Intervenes appropriately for drug overdose or substance abuse				
Supports childbirth to include: Fetal monitoring/assessment, warmer set-up, Apgar scoring, monitor O2 sats, initial assessment, weight and measurements; newborn care, maternal monitoring and support				
Protects patient populations from unexploded ordinance				
Assists with management of behavioral health issues that include risk for self-harm, suicide, violence, combat stress disorder, or PSTD				

Name____Date _____________

All preceptors involved in orientation must sign and initial in this signature chart.

Initials	Validator/ Preceptor signature		Initials	Validator/ Preceptor Signature

Summary of competency validation

I have read and understand all current Joint Trauma System Clinical Practice Guidelines________(Initials)/___________(Date)

Combat Casualty Care Knowledge Assessment Test: ________(Score)/________Date

Comments:

Areas of strength:

Areas for improvement:

Completion signatures:

As a licensed, professional, I acknowledge the fact that orientation cannot provide exposure to all aspects of patient care delivery within any specialty. I accept accountability for my professional practice and continued learning. When asked to engage skills, tasks, or other responsibilities that are not familiar to me, I will access appropriate resources for assistance, information, or guidance. Resources may include written directions, procedure manuals, learning modules or the expertise of colleagues. I will ensure that each patient that comes under my supervision receives safe, effective care that adheres to all established protocols.

Signature____Date____________________

Validator/ Preceptor /OIC____Date____________________

Name____Date _____________

Clinical Experience Log

Minimum 40 hours direct patient care in Level I/II Trauma Center annually – cross train to ICU, ED, OR

Date	Location and Trauma Center Level (I or II)	Direct Patient Care Hours	Unit Type (ICU, ER, ward, OR, etc)	Comments: Include unique experiences, patient mix, etc

Name ______________________________ Date ______________

ID#-________________ NTTC Clinical Experience Log

Clinical Rotation: ED ICU OR

Date:

Provider Type: MD/DO PA RN HM SO

Patient Acuity: ED- ESI-1 ESI-2 ESI-3 ESI-4 ESI-5
ICU- Critical Stable Critical Unstable
OR-Emergent/RB Urgent Non-Urgent

Mechanism of Injury
- Assault
- Auto vs Wheelchair
- Auto vs Bike
- Auto vs Pedestrian
- MVC
- MCC
- Bite- Animal/Insect
- Bite-Human
- Blast
- Burn
- Bus vs Bike
- Drug Overdose
- Substance Abuse
- Fall
- Gunshot Wound
- Hanging
- Set on Fire
- Stab

Penetrating Trauma
- Yes
- No

***Assessment:**
- Primary- P / O
- Secondary – P / O

***Compressible Hemorrhage**
- TQ – P / O
- Direct Pressure – P / O

***Non-Compressible Hemorrhage**
- Pelvic Binder – P / O
- DC Surgery
- REBOA

***Blood Products**
- PRBC – P / O
- FFP – P / O
- Platelets – P / O
- MTP – P / O

***Ultrasound:**
- FAST – P / O
- E-FAST – P / O

Surgical Procedures
- Craniotomy
- Neck Exploration
- Thoracic
- Abdominal
- Extremity Arm
- Extremity Leg
- Vascular Repair
- Damage Control

***Breathing Interventions**
- Chest Tube – P / O
- Finger Thoracostomy – P / O
- Needle Thoracostomy – P / O
- Auto-Transfusion – P / O
- Chest Tube Care of – P / O
- Mech Ventilation Care of – P / O

***Misc.**
- IV Access – P / O
- IO Access – P /O
- ETCO2 – P /O
- ABG – P / O
- Arterial Line Care of – P / O
- Central Line Care of – P / O
- Medication Admin – P / O
- Calculate TBSA – P / O
- Burn Dressing Change – P / O

Injury
- Trauma-Head
- Trauma-Neck
- Trauma-Chest
- Trauma-Abdomen
- Trauma-Extremities
- Trauma-Pelvis

***Airway Interventions**
- BVM – P / O
- ETT – P / O
- Cric – P / O
- LMA – P / O
- King LT – P / O
- NPA – P / O

***TCCC Medications**
- Fentanyl – P / O
- Morphine – P / O
- Hypertonic Saline – P / O
- Ketamine – P / O
- TXA – P / O

Comments:

***P = Performed Task / O = Observed Task; Please circle appropriate identifier where indicated**
Use only with permission from CDR Stakley, jami.a.stakley.mil@mail.mil, or CDR Torres, tony.torres5.mil@mail.mil. 3/18

ID#-________________ NTTC Clinical Experience Log

Abbreviations:
- ED – Emergency Department
- ICU – Intensive Care Unit
- OR – Operating Room
- MD – Medical Doctor
- DO – Doctor of Osteopath
- PA – Physician Assistant
- RN – Registered Nurse
- SO – Special Operator
- ESI – Emergency Severity Index
- RB – Red Blanket
- MVC – Motor Vehicle Crash
- MCC – Motorcycle Crash
- TQ – Tourniquet
- DC Surgery – Damage Control Surgery
- REBOA – Resuscitative Endovascular Balloon Occlusion of Aorta
- BVM – Bag Valve Mask
- ETT – Endotracheal Tube
- Cric – Cricothyroidotomy
- LMA – Laryngeal Mask Airway
- NPA – Nasopharyngeal Airway
- PRBC – Packed Red Blood Cells
- FFP – Fresh Frozen Plasma
- MTP – Massive Transfusion Protocol
- FAST – Focused Abdominal Sonography for Trauma
- EFAST – Extended Focused Abdominal Sonography for Trauma
- TXA – Transexamic acid
- TBSA – Total Body Surface Area
- ABG – Arterial Blood Gas
- IV – Intravenous
- IO – Intraosseous
- ETCO2 – End Tidal Carbon Dioxide

*P = Performed Task / O = Observed Task; Please circle appropriate identifier where indicated
Use only with permission from CDR Stakley, jami.a.stakley.mil@mail.mil, or CDR Torres, tony.torres5.mil@mail.mil. 3/18

Austere Environment of Care

Mission Specific Skills

Addresses: Role 2/En Route Care/GHOST Missions

1. Create a forward surgical team environment of care for delivery of damage control surgery
    a. Power
    b. Lab
    c. Radiology
    d. Pharmacy
    e. PUSH packs and resupply considerations
2. Ensures safe, effective movement of personnel, supplies and equipment
3. Organizes environment of care with consideration of unique needs of ER, OR, and ICU area
    a. Establishment of a WBB
    b. Refer to TIP-TOP ER/OR/ICU Nursing Tools for core competency requirements skills
    c. Sterilization
4. Engages principles and algorithms for ATLS in managing urgent patients in an <u>austere environment</u>
    a. Triage
    b. Resource conservation
5. Maintains patient stability during transport process
    a. Prepares supplies and equipment for air movement,
    b. Prepares patient for transport to care facility
    c. Provides safe and effective en route care
    d. Patient 'hand-off' to/from receiving unit/facility
6. Actively supports positive team dynamics unique to an austere environment
    a. Situation monitoring
    b. Builds personal and team resiliency
    c. Facilitates clear and accurate communication among team members
    d. Conflict resolution
    e. Mutual support

This page contains dynamic content -- Highest Possible Classification is **UNCLASSIFIED//FOR OFFICIAL USE ONLY**

BASE INFORMATION

SURVEY RESPONDENT ACCESS REQUIREMENT

- ( ) Anonymous (User identity not captured)
- ( ) Authenticated (Requires Intelink authentication)
- (•) Mixed (Default option, identity captured but not required)

SURVEY TITLE

Evaluation of Healthcare Systems Training for Combat Casualty Care

INTRODUCTION TEXT

The purpose of this study is to evaluate overall healthcare systems training for combat casualty care, including individual and team training in a deployed hospital care setting. This research aims to provide evidence based analysis of healthcare systems training outcomes in deployed hospital care to allow the

HIDE SURVEY HEADER SECTION - Clicking this hides the survey banner, title, and introduction text from the top of the survey

- [x] Hide header section

EMAIL RESPONSES - Have all survey responses emailed when a survey is taken

- [x] Email submitted surveys

Email address or addresses, also supports distribution lists (Please comma delimit email addresses)

Jennifer.d.trevino3.ctr@mail.mil

THANK YOU MESSAGE

Thank you for your time and consideration.

QUESTION NUMBERS

- [x] Display question numbers

CONDITIONAL SKIP LOGIC/BRANCHING

Note:

1. All survey questions MUST be completed and in the correct sequence BEFORE activating skip logic.
2. Subheading and Descriptive Text Question Types CANNOT be contained in your survey.
3. The only questions that force respondents to a single answer (pulldown and radiobuttons) can be used to create skip logic.

- [ ] Enable Skip Logic

ADD A NEW QUESTION

Click to Add a New Question

PREVIEW QUESTIONS (Click to preview survey)

Below is a preview of how your survey will look.

1. What is your gender?

( ) Male
( ) Female

2. Are you 18 years of age or older?

( ) Yes
( ) No

3. Have you ever served in the US Army?

- ◯ Yes
- ◯ No

4. Please select your current affiliation (choose only one).

- ◯ US Army (active duty)
- ◯ US Army Reserves
- ◯ Army National Guard
- ◯ Retired (US Army, active duty)
- ◯ Retired (US Army Reserves)
- ◯ Retired (Army National Guard)
- ◯ N/A
- ◯ Other

5. Were you classified as a non-physician medical provider (i.e., nurse, medic, or similar) during your military career?

- ◯ Yes
- ◯ No

6. Have you ever been a prisoner of war or detainee?

- ◯ Yes
- ◯ No

7. Have you deployed to a combat zone on or after 2001?

- ◯ Yes
- ◯ No

8. Are you willing and able to complete this survey about your most recent deployment experience?

- ◯ Yes
- ◯ No

9. What was your age at the beginning of your most recent deployment?

- ◯ 18 to 24 years
- ◯ 25 to 34 years
- ◯ 35 to 44 years
- ◯ 45 to 54 years
- ◯ 55 to 64 years
- ◯ Age 65 or older

10. What was your rank at the beginning of your most recent deployment?

- ◯ E-1 to E-4
- ◯ E-5 to E-6
- ◯ E-7 to E-9
- ◯ O-1 to O-3
- ◯ O-4 to O-6

11. What was your MOS or AOC at the beginning of your most recent deployment?

- ◯ 66H (Medical/Surgical Nurse)
- ◯ 66H8A/66S (Critical Care Nurse)
- ◯ 66HM5/66T (Emergency Nurse)
- ◯ 66F (Certified Registered Nurse Anesthetist)

- ○ 91B/68W (Combat Medic/EMT-B)
- ○ 68WF6 (Flight Medic)
- ○ 91C/68WM6/68C (Licensed Vocational Nurse)
- ○ Other

12. In what month/year did you leave for your most recent deployment?

13. For your most recent deployment, please select the location in which you were deployed.

- ○ Syria
- ○ South America
- ○ Afghanistan
- ○ Iraq
- ○ Kuwait
- ○ Africa
- ○ Kosovo
- ○ Other area in the Middle East
- ○ Other

14. How many years of experience did you have in your specialty at the beginning of your most recent deployment?

- ○ less than 3 years
- ○ greater than or equal to 3 years, but less than 5 years
- ○ greater than or equal to 5 years, but less than 10 years
- ○ greater than or equal to 10 years, but less than 15 years
- ○ greater than or equal to 15 years

15. Including your most recent deployment, how many times have you deployed to a combat zone?

- ○ 1
- ○ 2
- ○ 3
- ○ 4
- ○ 5 or more

16. How many years of military service did you have prior to your most recent deployment?

- ○ less than 3 years
- ○ greater than or equal to 3 years, but less than 5 years
- ○ greater than or equal to 5 years, but less than 10 years
- ○ greater than or equal to 10 years, but less than 15 years
- ○ greater than or equal to 15 years

17. To what Role/Level of Care were you deployed during your most recent deployment?

- ○ Role/Level 2 (FST, FST , FST-)
- ○ Role/Level 3 (CSH, CSH-)
- ○ Both, Role 2 and Role 3
- ○ Other

18. How were you selected for your most recent deployment?

- ○ Permanently assigned to unit
- ○ Professional Filler System (volunteered for deployment)
- ○ Professional Filler System (tasked for deployment)
- ○ Other

19. Were you evaluated (as an individual) for clinical competency to function in a deployed environment prior to your most recent deployment?

- ○ Yes
- ○ No

20. If you answered yes to the previous question, how was your competency evaluated (select all that apply).

- ☐ Successful completion of pre-deployment training
- ☐ Successful completion of pre-deployment checklist provided by deploying unit
- ☐ Successful achievement of civilian specialty certifications
- ☐ Successful completion of local pre-deployment certification exercise
- ☐ Unknown
- ☐ Other

21. What type of individual pre-deployment training did you receive, prior to your most recent deployment experience? Select all that apply.

- ☐ Tactical Combat Casualty Care (TCCC)
- ☐ Trauma Nursing Core Course (TNCC)
- ☐ Advanced Trauma Care for Nurses (ATCN)
- ☐ Advanced Cardiac Life Support (ACLS)
- ☐ Pediatric Advanced Life Support (PALS)
- ☐ Advanced Burn Life Support (ABLS)
- ☐ None
- ☐ Other (please provide detailed information)

22. Did you receive individualized pre-deployment training in any of the following general areas prior to your most recent deployment? Select all that apply.

- ☐ Role specificity
- ☐ Operations/logistics
- ☐ Personal safety and injury prevention
- ☐ Training for personnel recovery
- ☐ Preparation for traumatic experiences (i.e., resiliency training)
- ☐ None
- ☐ Other

23. Did you receive individualized pre-deployment training in any of the following specific areas prior to your most recent deployment? Select all that apply.

☐ AOC- or MOS-specific skills
☐ Equipment Familiarization
☐ Hemorrhage
☐ Resuscitation
☐ Burns
☐ Trauma
☐ Palliative Care
☐ Orthopedics
☐ Pediatrics
☐ "Damage Control" surgery/resuscitation
☐ Continuity of Care familiarization or consideration (treatment implications for each Role level)
☐ Resiliency
☐ Cultural Awareness
☐ Joint Operations
☐ None
☐ Other

24. If you did not receive individualized pre-deployment training in any of the specific areas prior to your most recent deployment, what was the primary reason?

○ No available resource
○ Time constraints
○ Scheduling
○ Unknown
○ Other

25. What type of team-based pre-deployment training did you receive, prior to your most recent deployment experience? Select all that apply.

☐ Army Trauma Training Detachment (ATTD) rotation
☐ Critical Care Air Transport Team Course (CCATT)
☐ Joint Regional Training Center (JRTC)
☐ None
☐ Other (please provide detailed information)

26. If you did not receive team-based pre-deployment training, what was the primary reason?

○ No available resource
○ Time constraints
○ Scheduling
○ Unknown
○ Other

27. How comfortable/confident did you feel in providing combat casualty care during your most recent deployment experience?

◯ Not at all prepared
◯ Slightly prepared
◯ Moderately prepared
◯ Very prepared
◯ Fully prepared

28. How prepared/well trained were you, during your most recent deployment experience?

◯ Not at all prepared
◯ Slightly prepared
◯ Moderately prepared
◯ Very prepared
◯ Fully prepared

29. How would you describe the pre-deployment training you received prior to your most recent deployment?

◯ Excellent
◯ Good
◯ Adequate
◯ Poor
◯ Extremely Poor

30. In your opinion, what was the most valuable preparation/training received during your most recent deployment experience? if you received none, please respond with "none".

31. What training would have helped increase your efficiency or effectiveness during your most recent deployment experience? Please specify.

32. What were the most critical combat casualty care skills you used during your most recent deployment experience? Select all that apply.

☐ Achieving hemostasis (stop bleeding)
☐ Airway management
☐ Breathing support
☐ Intravenous (IV) access
☐ IV fluid therapy
☐ Preventing hypothermia
☐ Care for penetrating eye injuries
☐ Medication administration
☐ Managing fractures
☐ Managing burns
☐ Monitoring vital signs (manually)
☐ Monitoring vital signs (electronically)
☐ Communicating/documenting care
☐ Providing care under fire
☐ Managing a mass casualty event
☐ Preparing the patient for evacuation/casualty movement

- ☐ Providing care during air evacuation
- ☐ Providing care during ground evacuation
- ☐ Caring for CBNRE patients
- ☐ Providing prolonged field care
- ☐ Other

33. Which of your skills may have benefited from additional individual pre-deployment training during your most recent deployment experience? Select all that apply.

- ☐ Achieving hemostasis (stop bleeding)
- ☐ Airway management
- ☐ Breathing support
- ☐ Intravenous (IV) access
- ☐ IV fluid therapy
- ☐ Preventing hypothermia
- ☐ Care for penetrating eye injuries
- ☐ Medication administration
- ☐ Managing fractures
- ☐ Managing burns
- ☐ Monitoring vital signs (manually)
- ☐ Monitoring vital signs (electronically)
- ☐ Communicating/documenting care
- ☐ Providing care under fire
- ☐ Managing a mass casualty event
- ☐ Preparing the patient for evacuation/casualty movement
- ☐ Providing care during air evacuation
- ☐ Providing care during ground evacuation
- ☐ Caring for CBNRE patients
- ☐ Providing prolonged field care
- ☐ None, training was sufficient
- ☐ Other

34. What core trauma competencies or skill capabilities, if any, were lacking from your team members during your most recent deployment experience? Select all that apply.

- ☐ Achieving hemostasis (stop bleeding)
- ☐ Airway management
- ☐ Breathing support
- ☐ Intravenous (IV) access
- ☐ IV fluid therapy
- ☐ Preventing hypothermia
- ☐ Care for penetrating eye injuries
- ☐ Medication administration
- ☐ Managing fractures
- ☐ Managing burns
- ☐ Monitoring vital signs (manually)
- ☐ Monitoring vital signs (electronically)
- ☐ Communicating/documenting care
- ☐ Providing care under fire

☐ Managing a mass casualty event
☐ Preparing the patient for evacuation/casualty movement
☐ Providing care during air evacuation
☐ Providing care during ground evacuation
☐ Caring for CBNRE patients
☐ Providing prolonged field care
☐ None, all team members were fully competent
☐ Other

35. Regarding leadership, how supported did you feel you/your team were during your most recent deployment experience?

○ Not at all supported
○ Slightly supported
○ Moderately supported
○ Very supported
○ Fully or extremely supported

36. During your most recent deployment experience, did you experience Role 2 underutilization (i.e., frequent transport from point of injury to a Role 3 facility - bypassing the Role 2; few patients/casualties, etc.)?

○ Yes
○ No
○ N/A

37. If you answered yes, please specify the type of underutilization.

38. Did you work with healthcare personnel (i.e., clinicians, providers, technicians, medics) from any other branch of the US Armed Forces (Navy or Air Force) during your most recent deployment experience? Select all that apply.

☐ Air Force Role/Level 2
☐ Air Force Role/Level 3
☐ Navy Role/Level 2
☐ Navy Role/Level 3
☐ Not applicable
☐ Other

39. Do you have another deployment experience you would like to tell us about?

○ Yes
○ No

40. What was your age at the beginning of your second most recent deployment?

○ 18 to 24 years
○ 25 to 34 years
○ 35 to 44 years
○ 45 to 54 years

- 55 to 64 years
- Age 65 or older

41. What was your rank at the beginning of your second most recent deployment?

- E-1 to E-4
- E-5 to E-6
- E-7 to E-9
- O-1 to O-3
- O-4 to O-6

42. What type of medical care provider were you at the beginning of your second most recent deployment?

- 66H (Medical/Surgical Nurse)
- 66H8A/66S (Critical Care Nurse)
- 66HM5/66T (Emergency Nurse)
- 66F (Certified Registered Nurse Anesthetist)
- 91B/68W (Combat Medic/EMT-B)
- 68WF6 (Flight Medic)
- 91C/68WM6/68C (Licensed Vocational Nurse)

43. In what month/year did you leave for your second most recent deployment?

44. For your second most recent deployment, please select the location in which you were deployed.

- Syria
- South America
- Afghanistan
- Iraq
- Kuwait
- Africa
- Kosovo
- Other area in the Middle East
- Other

45. How many years of experience did you have in your specialty at the beginning of your second most recent deployment?

- less than 3 years
- greater than or equal to 3 years, but less than 5 years
- greater than or equal to 5 years, but less than 10 years
- greater than or equal to 10 years, but less than 15 years
- greater than or equal to 15 years

46. How many years of military service did you have prior to your second most recent deployment?

- less than 3 years
- greater than or equal to 3 years, but less than 5 years
- greater than or equal to 5 years, but less than 10 years
- greater than or equal to 10 years, but less than 15 years
- greater than or equal to 15 years

47. To what Role/Level of Care were you deployed during your second most recent deployment?

- ○ Role/Level 2 (FST, FST , FST-)
- ○ Role/Level 3 (CSH, CSH-)
- ○ Both, Role 2 and Role 3
- ○ Other

48. How were you selected for your second most recent deployment?

- ○ Permanently assigned to unit
- ○ Professional Filler System (volunteered for deployment)
- ○ Professional Filler System (tasked for deployment)
- ○ Other

49. Were you evaluated (as an individual) for clinical competency to function in a deployed environment prior to your second most recent deployment?

- ○ Yes
- ○ No

50. If you answered yes to the previous question, how was your competency evaluated. Select all that apply.

- ☐ Successful completion of pre-deployment training
- ☐ Successful completion of pre-deployment checklist provided by deploying unit
- ☐ Successful achievement of civilian specialty certifications
- ☐ Successful completion of local pre-deployment certification exercise
- ☐ Unknown
- ☐ Other

51. What type of individual pre-deployment training did you receive, prior to your second most recent deployment experience? Select all that apply.

- ☐ Tactical Combat Casualty Care (TCCC)
- ☐ Trauma Nursing Core Course (TNCC)
- ☐ Advanced Trauma Care for Nurses (ATCN)
- ☐ Advanced Cardiac Life Support (ACLS)
- ☐ Pediatric Advanced Life Support (PALS)
- ☐ Advanced Burn Life Support (ABLS)
- ☐ None
- ☐ Other (please provide detailed information)

52. Did you receive individual pre-deployment training in any of the following specific areas prior to your second most recent deployment? Select all that apply.

- ☐ AOC- or MOS-specific skills
- ☐ Equipment Familiarization
- ☐ Hemorrhage
- ☐ Resuscitation
- ☐ Burns
- ☐ Trauma

☐ Palliative Care
☐ Orthopedics
☐ Pediatrics
☐ "Damage Control" surgery/resuscitation
☐ Continuity of Care familiarization or consideration (treatment implications for each Role level)
☐ Resiliency
☐ Cultural Awareness
☐ Joint Operations
☐ None
☐ Other

52. Did you receive individual pre-deployment training in any of the following general areas prior to your second most recent deployment? Select all that apply.

☐ Role specificity
☐ Operations/logistics
☐ Personal safety and injury prevention
☐ Training for personnel recovery
☐ Preparation for traumatic experiences (i.e., resiliency training)
☐ None
☐ Other

54. If you did not receive individualized pre-deployment training in any of the specific areas prior to your second most recent deployment, what was the primary reason?

○ No available resource
○ Time constraints
○ Scheduling
○ Other

55. What type of team-based pre-deployment training did you receive, prior to your second most recent deployment experience? Select all that apply.

☐ Army Trauma Training Detachment (ATTD) rotation
☐ Critical Care Air Transport Team Course (CCATT)
☐ Joint Regional Training Center (JRTC)
☐ None
☐ Other (please provide detailed information)

56. If you did not receive team-based pre-deployment training, what was the primary reason?

○ No available resource
○ Time constraints
○ Scheduling
○ Unknown
○ Other

57. How comfortable/confident did you feel in providing combat casualty care during your second most recent deployment experience?

- ◯ Not at all prepared
- ◯ Slightly prepared
- ◯ Moderately prepared
- ◯ Very prepared
- ◯ Fully prepared

58. How prepared/well trained were you, during your second most recent deployment experience?

- ◯ Not at all prepared
- ◯ Slightly prepared
- ◯ Moderately prepared
- ◯ Very prepared
- ◯ Fully prepared

59. How would you describe the pre-deployment training, related to your second most recent deployment?

- ◯ Excellent
- ◯ Good
- ◯ Adequate
- ◯ Poor
- ◯ Extremely Poor

60. In your opinion, what was the most valuable preparation/training received during your second most recent deployment experience? if you received none, please respond with "none".

61. What training would have helped increase your efficiency or effectiveness during your second most recent deployment experience? Please specify.

62. What were the most critical combat casualty care skills used during your second most recent deployment experience? Select all that apply.

- ☐ Achieving hemostasis (stop bleeding)
- ☐ Airway management
- ☐ Breathing support
- ☐ Intravenous (IV) access
- ☐ IV fluid therapy
- ☐ Preventing hypothermia
- ☐ Care for penetrating eye injuries
- ☐ Medication administration
- ☐ Managing fractures
- ☐ Managing burns
- ☐ Monitoring vital signs (manually)
- ☐ Monitoring vital signs (electronically)

- ☐ Communicating/documenting care
- ☐ Providing care under fire
- ☐ Managing a mass casualty event
- ☐ Preparing the patient for evacuation/casualty movement
- ☐ Providing care during air evacuation
- ☐ Caring for CBNRE patients
- ☐ Providing prolonged field care
- ☐ Other

63. Which of your skills may have benefited from additional individual pre-deployment training during your second most recent deployment experience? Select all that apply.

- ☐ Achieving hemostasis (stop bleeding)
- ☐ Airway management
- ☐ Breathing support
- ☐ Intravenous (IV) access
- ☐ IV fluid therapy
- ☐ Preventing hypothermia
- ☐ Care for penetrating eye injuries
- ☐ Medication administration
- ☐ Managing fractures
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- ☐ Managing burns
- ☐ Monitoring vital signs (manually)
- ☐ Monitoring vital signs (electronically)
- ☐ Communicating/documenting care
- ☐ Providing care under fire
- ☐ Managing a mass casualty event
- ☐ Preparing the patient for evacuation/casualty movement
- ☐ Providing care during air evacuation
- ☐ Providing care during ground evacuation
- ☐ Caring for CBNRE patients
- ☐ Providing prolonged field care
- ☐ None, training was sufficient
- ☐ Other

64. What core trauma competencies or skill capabilities, if any, were lacking from your team members during your second most recent deployment experience? Select all that apply.

- ☐ Achieving hemostasis (stop bleeding)
- ☐ Airway management
- ☐ Breathing support
- ☐ Intravenous (IV) access
- ☐ IV fluid therapy
- ☐ Preventing hypothermia
- ☐ Care for penetrating eye injuries
- ☐ Medication administration
- ☐ Managing fractures
- ☐ Managing burns

- ☐ Monitoring vital signs (manually)
- ☐ Monitoring vital signs (electronically)
- ☐ Communicating/documenting care
- ☐ Providing care under fire
- ☐ Managing a mass casualty event
- ☐ Preparing the patient for evacuation/casualty movement
- ☐ Providing care during air evacuation
- ☐ Providing care during ground evacuation
- ☐ Caring for CBNRE patients
- ☐ Providing prolonged field care
- ☐ None, all team members were fully competent
- ☐ Other

65. Regarding leadership, how supported did you feel you/your team was during your second most recent deployment experience?

- ○ Not at all supported
- ○ Slightly supported
- ○ Moderately supported
- ○ Very supported
- ○ Fully or extremely supported

66. During your second most recent deployment experience, did you experience Role 2 underutilization (i.e., frequent transport from point of injury to a Role 3 facility - bypassing the Role 2; few patients/casualties, etc.)?

- ○ Yes
- ○ No
- ○ N/A

67. If you answered yes, please specify the type of underutilization.

68. Did you work with healthcare personnel (i.e., clinicians, providers, technicians, medics) from any other branch of the US Armed Forces (Navy or Air Force) during your second most recent deployment experience? Select all that apply.

- ☐ Air Force Role/Level 2
- ☐ Air Force Role/Level 3
- ☐ Navy Role/Level 2
- ☐ Navy Role/Level 3
- ☐ Not applicable
- ☐ Other

69. What is your current age?

- ○ 18 to 24 years
- ○ 25 to 34 years
- ○ 35 to 44 years
- ○ 45 to 54 years

◯ 55 to 64 years
◯ Age 65 or older

70. What is your current rank? If you are no longer in the Army, what was your most recent rank?

◯ E-1 to E-4
◯ E-5 to E-6
◯ E-7 to E-9
◯ O-1 to O-3
◯ O-4 to O-6

71. What is/was your MOS or AOC?

◯ 66H (Medical/Surgical Nurse)
◯ 66H8A/66S (Critical Care Nurse)
◯ 66HM5/66T (Emergency Nurse)
◯ 66F (Certified Registered Nurse Anesthetist)
◯ 91B/68W (Combat Medic/EMT-B)
◯ 68WF6 (Flight Medic)
◯ 91C/68WM6/68C (Licensed Vocational Nurse)
◯ Other

72. We greatly value your feedback, comments, and/or recommendations. Please feel free to share any additional information regarding your deployment, training experience, or this survey.

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