# U.S. Central Command Theater Trauma System Assessment Report

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BY THE JOINT TRAUMA SYSTEM (JTS)


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Assessment data is gathered under field conditions. Although limited, results are provided to indicate perspectives and meet the need for timely system assessment. Opinions, interpretations, conclusions, and recommendations are those of the authors; recommendations are pre-decisional, and are not necessarily endorsed by U.S. Central Command, the Services, or the Department of Defense.

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# EXECUTIVE SUMMARY

Multiple and unprecedented combat casualty care improvements have occurred within the U.S. military during the recent conflicts in Iraq and Afghanistan. Military medical personnel are proud of this achievement and commanders and Service members now depend on and expect these capabilities to continue. For the first time in U.S. history, the military has codified trauma and combat casualty care as outlined and mandated by Department of Defense Instruction (DoDI) 6040.47, Joint Trauma System (JTS), dated 28 Sep 2016[1] and Section 707 of the National Defense Authorization Act (NDAA) 2017.[2] However, the existence of this policy and law do not guarantee universal and comprehensive propagation of best-practice trauma concepts and capabilities at the individual, unit, and system level. Given the diversity of deployed units within and across Military Services; the lack of standardization of medical training, equipment, and standard operating procedures; the variability between Active Duty, Reserve, and National Guard units; the non-doctrinal and ad-hoc changes in Role 2 forward surgical and resuscitative care; and the absence of individual and unit validation for trauma care delivery; there exists a potential not only for trauma care delivery heterogeneity but also decreased compliance with evidence-based best-practice guidelines as provided by the Department of Defense JTS. Challenges remain with respect to the complete integration and implementation of JTS clinical practice guidelines (CPGs)[3] across the entire deployed force. Through mandate and enforcement, medical and non-medical leadership are the key to overcoming these challenges; however, a full and unconditional commitment to this issue is required.

DoDI 6040.47 directed the development and integration of Combatant Command Trauma Systems (CTS) modeled after the U.S. Central Command (CENTCOM) Joint Theater Trauma System (JTTS) which was deployed from 2004 to 2014. The CENTCOM JTTS advised, assisted, and educated deployed teams; encouraged quality and consistent trauma care delivery through compliance with standards and evidence-based best-practice CPGs; and established a performance improvement (PI) cycle through data collection, data analysis, and a Joint Theater Trauma Registry (JTTR). The JTTS team worked directly for the CENTCOM Surgeon. During the drawdown of combat-deployed forces in 2014, the JTTS was disbanded resulting in inconsistent coordination and synchronization of trauma systems to include PI efforts. However, despite this degradation in organized structure and leadership, there has been an increased penetrance of prehospital training and Role 1 standards as established through JTS Tactical Combat Casualty Care (TCCC) Guidelines.[4] Unit-level training and subsequent trauma care delivery in accordance with JTS TCCC Guidelines can be in part attributed to medical and non-medical leadership mandate and enforcement of the 2009 Secretary of Defense prehospital transport “Golden Hour” Policy, as well as in anticipation of the newly revised DoDI 1322.24, Medical Readiness Training (MRT), dated 16 Mar 2018,[5] which optimizes prehospital medical readiness training by promoting universal Tactical Combat Casualty Care (TCCC) training, certification, and proficiency. Central Command Regulation (CCR) 40-7, Clinical Operations Program, dated 6 Mar 2017,[6] formalized the CTS for the CENTCOM theater. One of the initiatives of the theater trauma system was to have a Trauma Medical Director to absorb some of the functions of the previously deployed JTTS Director. The U.S. Air Force has utilized a “Trauma Czar” position as the regional trauma medical director over the last 7 years at Craig Joint Theater Hospital, Bagram Airfield (BAF) in Afghanistan. The U.S. Army recently adopted this model when it reestablished the Role 3 Combat Support Hospital at the Baghdad Diplomatic Support Center (BDSC) in Iraq. As a holistic theater trauma system assessment has not occurred since 2014, a team of medical leaders from the JTS in San Antonio, Texas, and

CENTCOM in Tampa, Florida, conducted a trauma assessment of Operation Inherent Resolve in Iraq (OIR-I) and Syria (OIR-S) and Operation Freedom's Sentinel (OFS) in Afghanistan from January to February 2018.

Using standard military convention outlined by Chairman of the Joint Chiefs of Staff Instruction (CJCSI) 3170.01, major findings and recommendations from this most recent trauma assessment are organized in the tables below according to Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy (DOTMLPF-P) analysis format as defined in the Joint Capabilities Integration Development System (JCIDS) process.[7,8] As an initial step in a functional solutions analysis, these major findings and recommendations intend to consider capability gaps and solutions that have potential to influence the context of strategic direction, requirements, and acquisition for CENTCOM forces, as well as the total U.S. military force. An Office of Primary Responsibility (OPR) has been designated for each recommendation. The summarized findings and recommendations are outlined below.

## MAJOR FINDINGS

| MAJOR FINDINGS |
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| **Doctrine** |
| ▪ Doctrinal support of TCCC has increased substantially since 2013. |
| ▪ Medical and non-medical leader support of TCCC and the JTS has increased throughout CENTCOM. |
| ▪ All units indicated that there was leadership support for trauma documentation and getting data into the DoD Trauma Registry (DoDTR) and that they were aware of the mechanisms. |
| ▪ Notable were many comments regarding challenges with medical records in the deployed environment (more details under "Materiel"). |
| ▪ Current doctrine supports the requirement for trauma records to get uploaded into the DoDTR; however this continues to be challenging for all units. The most consistent group for documentation was the medical evacuation (MEDEVAC) teams who report greater than 90% of their Patient Care Reports (PCRs) getting sent to the JTS. |
| **Organization** |
| ▪ The CTS has replaced the JTTS with designated Trauma Medical Directors intrinsic to the Role 3 facilities. |
| ▪ There is no single medical command in CENTCOM. Responsibility for medical operations and command and control is shared amongst a myriad of organizations resulting in a diffusion of responsibility and inability to effectively solve problems and make decisions. |
| ▪ There is no standardized and systemic method for medical team replacement. |
| ▪ There is little to no synchronization of the medical effort on bases. |
| ▪ There are gaps in coordination between units allocated to special operations forces (SOF) and conventional forces. |
| ▪ Coordination of patient movement is not standardized, and occurs differently in OFS, OIR-I, and OIR-S. |
| ▪ Patient movement is best coordinated when medical evacuation (MEDEVAC) and air evacuation (AE) patient movement functions are consolidated |
| ▪ The role and mission of damage control surgery (DCS) teams embedded within Role 3 MTFs needs to be clarified and these teams must be trained and equipped for the mission. |
| **Training** |
| ▪ Clinical skills exposure for medics is very limited at home station. Barriers to increased clinical practice are primarily related to multiple non-medical duties or providing "stand-by" medical support. |

## MAJOR FINDINGS

- Most flight medics in CENTCOM are now trained to the level of Critical Care Flight Paramedic.
- No trauma training specific to nurses is specified in the CENTCOM training requirements.
- Pre-deployment training for surgeons has improved in comparison to previous trauma system assessments; however, the requirements remain inconsistent between Services and are inconsistently enforced and frequently waived.
- Residency training may not include any military-specific or CPG training, therefore it is easily possible for some physicians to deploy without any orientation on CPGs and in fact some are not aware of the existence of CPGs.
- Many physicians are not current in advanced trauma life support (ATLS).
- Mission support by surgical teams is in high demand. Better training is needed as well as means to mitigate skill degradation of highly perishable medical skills.
- Mission-specific training for neurosurgeons, ophthalmologists, and head and neck surgeons is needed.
- In-theater skill sustainment training is needed during times of low clinical operational tempo.

### Materiel

- There are multiple issues with medical information systems that must be addressed.
  a. A myriad of temporary solutions to deployed electronic health records (EHR) has left a system of cobbled-together patches that lack interoperability and reliability.
  b. Personnel are required to duplicate input into multiple systems, or create various local solutions for backup due to overall unreliability of the EHR.
  c. It is difficult and time-consuming for medical providers to gain access to deployed health systems, specifically those required to review and document patient care.
  d. Deployed computer systems are not reliable.
- Processes that should be easily amenable to automated solutions, still require information to be gathered and submitted to various organizations.
- Medical equipment in theater is a mix of Theater Provided Equipment (TPE) and organic unit equipment. The process of maintaining and replacing TPE is not well-defined and varies from site to site. There is no system that monitors the maintenance and determines life-cycle replacement of TPE.
- The process of accounting for equipment within theater is archaic. Within the current system, unit organic equipment must be accountable by serial number to the specific unit, while TPE can be exchanged within the patient movement system. Accountability for a specific device is unnecessary and limits the ability to maintain equipment and maintain patients on equipment.
- The procedure of closing each unit's Class VIII DODAAC account and orders when they redeploy has resulted in items being on order for more than a year.
- Availability of TCCC-recommended supplies is approximately 80-90% in Prehospital/Role 1 units.
- Low titer type O whole blood (LTOWB) is in high demand due to ease of use and perceived benefits.
- Many users of LTOWB are not documenting medical care provided, nor are they successfully forwarding documentation to JTS. Tracking outcomes of LTOWB use is a priority.

### Leadership and Education

- Due to the professional officer filler system (PROFIS), Army forward surgical teams (FSTs) have very junior leaders with no deployment experience leading surgeons who outrank them significantly in time and experience.
- There is no easily accessible, organized after action report (AAR) repository in CENTCOM.
- There is no standardized PI at the unit level in theater.
- The CENTCOM Trauma System is lacking a Trauma Nurse Coordinator (TNC) at the Role 3s.
- There is no pre-deployment training in PI.

| **Personnel** |
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| ▪ The position of deployed CENTCOM Trauma System Director has been assigned to the lead Role 3 trauma surgeon in each theater. |
| ▪ This structure functions adequately during periods of low operational tempo, however the position is limited by assignment within Task Force (TF) MED, daily responsibilities at the Role 3, and lack of adequate manning to allow trauma directors the time and flexibility to travel to outlying sites. |
| ▪ There is no designated Trauma Nurse Coordinator within the CENTCOM Trauma System. |
| ▪ There are many unintended problems related to the 90-day "Boots on Ground" program for Army Reservists. Time for pre-deployment training and overlap with outgoing team members is minimized. An additional consequence includes placing low-ranking officers in charge of senior officers. |
| ▪ The en route critical care nursing program has proven highly successful. |
| ▪ There is no career pathway to develop expertise and leadership in en route nursing care. |
| ▪ DCR teams have been improvised ad hoc in theater. There is no formal training or doctrine to support this mission, and as such no logistical set or mission capability expectations exist. |
| **Facilities** |
| ▪ The lack of an accepted medical facility standard in CENTCOM causes confusion and concern for medical personnel accustomed to stateside standards. |
| ▪ Role 3 facilities are increasingly attempting to apply U.S. standards to deployed operating room facilities. This has resulted in mission shutdown in both Kuwait and Qatar, with a halt on elective and semi-elective surgeries within CENTCOM. |
| ▪ History and recent experience has shown that Role 3 facilities are not short-term commitments. |
| ▪ Role 2 and 3 facilities are set up differently at every location, with new and unique challenges at each site. |
| **Policy** |
| ▪ The "Golden Hour" policy[9] has driven the forward deployment of numerous non-doctrinal minimalist surgical teams to support the goal of reaching a surgical capability within 1 hour. However, multiple challenges with assessing the performance of these "mission support" surgical teams have left a void of knowledge in regard to the outcomes of patients treated by such teams. |
| ▪ There is a lack of clinical oversight and participation in performance improvement tracking for some Role 2 surgical teams. |
| ▪ The CENTCOM theater entry training requirements do not meet all JTS-recommended training and the policy should be updated. |
| ▪ It is CENTCOM policy as well as standard of care for all medical caregivers worldwide to document care provided; however, there is currently no means of enforcing this policy. |
| ▪ U.S. Special Operations Command (SOCOM) documentation policies do not require submission of medical records. In many cases only classified AARs are created. |
| ▪ Adherence to performance improvement policies and trending compliance with CPGs relies on surgical teams to submit medical records to JTS. |
| ▪ Many units are not aware of the CENTCOM trauma naming policy. This results in one patient having multiple names or multiple patients having the same name so that even if records are received, they cannot be matched to one individual. |
| ▪ There is a lot of confusion about the indications to administer tranexamic acid (TXA). |

# RECOMMENDATIONS

| Domain and Recommendation | |
|---|---|
| **Doctrine** | **OPR** |
| 1. Strengthen support for accurate and timely collection of medical data into the DoDTR through doctrine, materiel capabilities, and ongoing assessment of compliance with established COCOM policies. | CENTCOM SG |
| 2. Improve cooperation between the Joint Force Surgeon (JFS), CENTCOM Surgeon, and JTS in regard to doctrine development.<br>a. Maintain a trauma clinical specialist at JFS office as liaison to the JTS and COCOM trauma systems. **(OPR JFS)**<br>b. Increase trauma clinician and trauma system specialist involvement in CENTCOM medical planning. **(OPR CENTCOM SG, OCR JTS)**<br>c. JTS review of CENTCOM theater-entry medical training requirements. **(OPR CENTCOM SG, OCR JTS)**<br>d. Increase assessment of compliance with established policies, particularly:<br>i. Theater-entry medical training requirements. **(OPR CENTCOM SG)**<br>ii. Medical documentation and availability to DoDTR.[1,6] **(OPR CENTCOM SG)** | CENTCOM SG |
| 3. Update Joint Publication (JP) 4-02 to provide an accurate common definition and architecture of Role 2 medical units.<br>a. Recommend adopting Role 2 "area support" for traditional units (FST/FRST, split-FST/FRST, EMU, ASMC) and Role 2 "mission support" for small surgical teams (SOST, SRT, GST, GHOST, etc) designed to extend "Golden Hour" coverage.<br>b. Clarify Role 2 definition to include the three subcategories of Role 2: (1) light maneuver/mission support, (2) area support with limited capability, and (3) area support with enhanced capability. | JFS |
| 4. Update medical evacuation (MEDEVAC) doctrine (Army Techniques Publication 4-02.2)[9] to support two medic manning of designated MEDEVAC platforms; train and man units accordingly. | U.S. ARMY Combined Arms Center and AMEDDC&S |
| **Organization** | **OPR** |
| 5. Support Joint Requirements Oversight Council (JROC) Memorandum 125-17, Forward Resuscitative Care in Support of Dispersed Operations DOTMLPF-P Change Recommendation by Joint Force Surgeon.[11] | JFS |
| 6. Consolidate command and control of tri-service medical elements and define roles of responsibility.<br>a. Clarify Chain of Responsibility for all Role 2 elements in CENTCOM, particularly in regard to logistic support.<br>b. Designate regional trauma medical director (TMD) for each theater (OFS and OIR), mandate pre-deployment trauma system training with the JTS for this position and empower this position with CENTCOM authority to oversee all trauma care in theater.<br>c. Support TMD in each theater with appropriate support staff: TNC and administrative support element. | CENTCOM SG |
| 7. Create a formal trauma system pre-deployment course. | JTS |
| 8. Build a CENTCOM integrated medical planning cell to synchronize efforts and optimize medical coverage between SOF and conventional forces. | CENTCOM SG, SOCOM SG |

| Domain and Recommendation | |
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| 9. Mandate base operational support and integration (BOS-I)/mayor cell/base leadership to develop a Senior Medical Council on each compound to coordinate medical efforts, enforce on-base emergency response plan, and prevent gaps in provider coverage. | CENTCOM CDR |
| 10. Consolidate intra-theater fixed and rotary wing patient movement coordinators into a single location and ensure that cross communication occurs to assign the most efficient evacuation platform, particularly for intra-theater transfer missions.<br>a. Ensure a single point of contact to initiate all patient movements from any location. | CENTCOM CDR |
| 11. CENTCOM surgeon and regional trauma medical directors verify on-base emergency response plans and mass casualty (MASCAL) plans for all forward bases and ensure that such plans are rehearsed regularly. | CENTCOM SG |
| 12. Clarify role and mission of damage control surgery (DCS) teams embedded within Role 3 MTFs and ensure teams are trained and equipped for the mission. | SERVICE SGs |
| **Training** | **OPR** |
| 13. Establish requirements for trauma-relevant clinical practice for medics/corpsmen, nurses, and other medical providers.<br>a. Fund methods to free up time for increased clinical practice (e.g., civilian contractors to support non-combat-related duties). **(OPR SERVICE SGs)**<br>b. Centralize and facilitate training Memorandum of Agreement (MOA) process for civilian trauma center rotations and emergency medical service (EMS) training. **(OPR SERVICE SGs)** | CENTCOM SG (set requirements)<br>JTS (set training standards)<br>SERVICE SGs (conduct training) |
| 14. JTS establish minimum medical training standards for deployed clinicians:<br>a. ATLS training for all physicians at Role 2 and Role 3 facilities.<br>b. Trauma Nursing Core Course (TNCC) or Advanced Trauma Care for Nurses (ATCN) for registered nurses (RNs) caring for trauma patients.<br>c. EWSC for all trauma and general surgeons.<br>d. Specialty specific trauma course for surgical sub-specialists.<br>e. TCCC for Medical Providers for all providers, nurses, and medics. | OPR JTS,<br>SERVICE SGs |
| 15. Service components report compliance rates for CENTCOM-required pre-deployment medical and trauma training to CENTCOM SG quarterly. | AFCENT, ARCENT, NAVCENT |
| 16. Service components continue to work to fully implement TCCC training IAW DoDI 1322.24, MRT, 16 Mar 2018.[5]<br>a. CENTCOM report compliance rates for TCCC training (all medical and non-medical) to JTS. **(OPR CENTCOM SG)** | SERVICE SGs |
| 17. Coordinate with the Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight to develop metrics to track CPG working knowledge compliance IAW DoDI 1322.24, MRT.[5] | CENTCOM SG, JTS |
| 18. Develop specific training courses, expand existing training courses, and incorporate lessons learned into future Role 2 readiness exercises to improve ability to conduct mission support operations outside of established MEDEVAC range rings for surgical and non-surgical resuscitation teams. **(OCR JTS)** | SERVICE SGs |
| 19. Include JTS CPGs and performance improvement processes in medical Professional Military Education and Graduate Medical Education programs. | DHA,<br>SERVICE SGs |
| 20. Develop CPGs, standards, and program of instruction for Prolonged Field Care (PFC). | DHA, JTS |
| 21. Review course enrollment restrictions for reserve units for key pre-deployment courses (TCCC, TCMC, BCT3, JFCTMC, EWSC) and ensure that reserve units that are deploying receive the same priority for training as active duty units.<br>a. Ensure training courses meet demand for training; identify key medical training courses and provide projected training needs annually. **(OPR CENTCOM SG)** | SERVICE SGs |

| Domain and Recommendation | |
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| 22. Review pre-deployment curricula for existing trauma training courses.<br>a. Ensure walking blood bank (WBB) CPGs and standards are established and pre-deployment training is conducted for all Role 1-3. | DHA, JTS |
| 23. JTS update CPG teaching slides and post to website as soon as possible. | JTS |
| 24. Services establish career pathways for medics/corpsmen to allow progression from EMT-basic to paramedic to registered nurse, physician assistant, or physician. | SERVICES |
| 25. MTFs provide better customer service to sponsor medic training and sustainment and facilitate MTFs as actual training platforms and allow medics to practice to their full scope of training. | DHA,<br>SERVICE SGs |
| 26. Improve and increase Chemical Biological Radiological Nuclear (CBRN) response simulation training. | DHA |
| 27. Deploying physicians, physician assistants, nurses, medics, corpsmen and pararescuemen should be trained in the JTS-approved TCCC for Medical Personnel course prior to deployment IAW with the current USCENTCOM directive. | SERVICE SGs |
| 28. Committee on Tactical Combat Casualty Care (CoTCCC) review TCCC curriculum for airway management for medical providers and provide feedback to primary training sites. | JTS |
| **Materiel** | **OPR** |
| 29. Commission a computer systems working group, to include the DHA Theater Functional Working Group and AT&L/JOMIS, to solicit solutions on interconnectivity and address common issues across CENTCOM. | CENTCOM CDR |
| 29. Replace outdated deployed EHRs with a functional and reliable system. | DHA J35/Theater Functional Working Group<br>OCR: AT&L/JOMIS |
| 30. Develop simple and reliable system for scanning hand-written medical records, such as a secure phone application, to photograph and send images. | DHA J35/TFWG<br>OCR: AT&L/JOMIS |
| 31. Include photo documentation relevant to patient care in the improved deployed EHR. | DHA<br>OCR: JOMIS |
| 32. Determine method of getting the ''Five Eye" Coalition Nations (US, UK, Australia, Canada, NZ) permission to use Medical Communications for Combat Casualty Care (MC4) and other computer systems required to document and track care. | CCSG |
| 33. Develop CENTCOM information sheet for medical personnel describing how to get accounts and to access past medical histories using Theater Medical Data Store (TMDS) or Application Virtualization Hosting Environment (AVHE) and streamline the account application process across theater. | CENTCOM SG |
| 34. Update the JTS Use of Electronic Documentation CENTCOM AOR CPG. | JTS |
| 35. Mandate medical units (with exemptions as deemed necessary) to bring medical equipment into theater, except for Role 3 facilities and medical information systems which are better managed in theater. | CENTCOM SG |
| 36. Give coalition partners access to TMDS when using U.S. blood supply and supporting U.S. casualties. | CENTCOM SG |
| 37. Add blood storage containers (Golden Hour containers and Hemacools or similar) to MEDEVAC medical equipment sets (MES) and expedite implementation of the new MEDEVAC MES. | MEPD |

| Domain and Recommendation | |
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| 38. Add frequency modulation (FM) communication to Role 2 and Role 3 capabilities and establish a process to deliver updated MIST reports en route. (M – Mechanism of injury, I – Injury, S – Signs and Symptoms, T – Treatment). | CENTCOM SG |
| 39. Implement system already in use by Aeromedical Evacuation (AE) to scan and track all equipment required for patient movement within theater and eliminate individual device accountability to a specific unit. | CENTCOM SG |
| 40. Develop a solution to have one systems account request form for all medical applications in theater. | CENTCOM SG |
| 41. Develop a central store of replacement patient resuscitation equipment and a responsive system to deliver replacement equipment when and where it is needed. | CENTCOM SG |
| 42. Establish a logistics process to review and selectively transfer outstanding logistics orders from a unit that is redeploying to their replacement unit. | CENTCOM SG |
| 43. Ensure that new CT scanners purchased are at least 64-slice scanners. | CENTCOM SG |
| 44. Pre-screen all deploying military (and ideally all civilians) for WBB, to include identification of LTOWB donors, prior to deployment and record results in TMDS. | SERVICES |
| 45. Increase availability of LTOWB through the Armed Services Blood Program (ASBP).<br>a. Expedite transition to citrate phosphate dextrose with adenine (CPD-A) storage solution for whole blood.<br>b. Forward position whole blood donor centers in Qatar and Kuwait. | ASBP |
| 46. Prioritize prehospital medics and austere surgical teams to receive available LTOWB. | CENTCOM SG |
| 47. Ensure trauma clinician input into distribution of limited blood resources. | CENTCOM SG |
| 48. Improve data collection, documentation, and tracking of LTOWB use throughout CENTCOM. | CENTCOM SG |
| 49. Eliminate the medical interior for MEDEVAC aircraft. | MEPD |
| 50. Review availability of fentanyl lozenges, ketamine, and all other medications recommended in TCCC guidelines. | CENTCOM SG |
| 51. CoTCCC undertake a comprehensive review of currently available limb tourniquets and consider updating TCCC tourniquet recommendations as indicated by the available evidence. | **JTS** |
| **Leadership and Education** | **OPR** |
| 52. AMEDD provide update to CENTCOM SG on future management of PROFIS system, FST, and the future Forward Resuscitative Surgical Team (FRST) leadership. | ARMY SG |
| 53. Create and/or improve awareness of CENTCOM AAR repository.<br>a. Create a standard medical unit AAR template and require submission of unit-level AARs to CENTCOM SG for all medical units and use AARs to grow organizational performance improvement and leader self-learning.<br>b. Improve access to and knowledge of existing CENTCOM AARs for deploying leadership. | CENTCOM SG |
| 54. Work with operational medical units to determine a communication strategy for medical leaders that outlines CCR requirements and highlights important information required for continuity (medical transition checklist). | CENTCOM SG |
| 55. JTS develop a pre-deployment Trauma System and PI training course for Role 3.<br>a. CENTCOM require at least one TNC and Role 3 trauma medical directors to attend JTS PI course. (**OPR CENTCOM SG)** | JTS, DHA |
| 56. Develop a DoDTR-based PI report for CENTCOM and publish monthly, to include prehospital care and surgical capabilities. | JTS |
| 57. Develop a path for leadership for trauma professionals that encourages them to command Role 2 and Role 3 MTFs. | SERVICES |

| Domain and Recommendation | |
|---|---|
| **Personnel** | **OPR** |
| 58. Add an additional senior trauma surgeon as the CENTCOM trauma medical director and a senior TNC to support the COCOM Trauma System. Provide trauma system education to assigned personnel prior to deployment. | CENTCOM SG<br>OCR: JTS |
| 59. Reassess implementation of 90-day boots on ground (BOG) program.<br>a. Allow deployed leaders access to physician evaluations from past deployments. **(OPR CENTCOM SG)**<br>b. Remove 90-day BOG positions from surgical teams assigned to SOF. **(OPR USAR Command, OCR SOCOM).**<br>c. Increase volunteer opportunities for unfilled deployment positions across all three services, active duty and reserve. **(OPR SERVICE SGs)** | ARMY SG,<br>CENTCOM SG,<br>SERVICE SGs |
| 60. Provide quality oversight and peer review for professionals deploying in PROFIS positions, and allow units to access prior performance reports. | SERVICE SGs |
| 61. Army update PROFIS provider deployment and unit preparation. | ARMY SG |
| 62. Services update unit/team deployment preparation and provide report to CENTCOM SG | SERVICE SGs |
| 63. Add Emergency Medicine physician to all Role 2 manning documents. | SERVICE SGs |
| 64. Review and refine a career pathway for military en route care nurses.<br>a. Standardize equipment, training, protocols, and readiness level progression for en route Critical Care Nurses (ECCNs).<br>b. Assign ECCNs to MEDEVAC units prior to pre-deployment training.<br>c. Deploy ECCNs with MEDEVAC unit for duration of unit deployment.<br>d. Develop and formalize ECCN Military Occupational Specialty (MOS); basic and advanced; teaching, leadership, and mentorship positions; and commensurate opportunities for career advancement and management within this specialty. | SERVICE SGs |
| 65. ECCNs complete aircraft progressions prior to deployment.<br>a. If this is not possible, ECCNs should overlap in theater in order to maintain continuous coverage using outgoing ECCNs. | ARMY SG,<br>CENTCOM SG |
| **Facilities** | **OPR** |
| 66. Develop and publish CCSG position paper outlining basic decision criteria for expeditionary facilities. | JFS |
| 67. When constructing fixed facilities in deployed locations, plan for long-term commitment and construct the facility to high standards with the goal of meeting U.S. standards, particularly within the operating room complex. Retrofitting and upgrading the facilities is complex and expensive. | JFS |
| 68. Construct major medical facilities (Role 3 and Role 4) on an Air Base with runways meeting C-17 military transport aircraft requirements. | JFS |
| 69. Develop standardized Role 2 (mobile and fixed) and Role 3 facility plans and implement across the services. | JFS |

| Policy | OPR |
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| 70. Provide critical review of "Golden Hour" policy[9] to include review of trauma casualties and medical treatment facility (MTF) utilization and provide recommendation on keeping or updating the policy.<br>a. Mandate and enforce documentation of care provided by all surgical teams in theater to complete critical review of "Golden Hour" policy. | CENTCOM SG |
| 71. CENTCOM expand efforts to enforce medical documentation policies. | CENTCOM CDR, CENTCOM SG |
| 72. SOCOM review, train, and enforce medical documentation policies. Enforce creation and submission of unclassified medical records to meet JTS standards. | SOCOM SG |
| 73. CENTCOM surgeon work with JTS to review and update medical training guidance for theater entry. **(OPR CENTCOM SG and JTS)**<br>a. Service components update line remarks for medical personnel after publication of updated CENTCOM medical training requirements. **(OPR AFCENT, ARCENT, NAVCENT)** | CENTCOM SG, JTS |
| 74. Expand CENTCOM Medical Rules of Engagement (MROE) to increase treatment of Host Nation (HN) casualties.<br>a. Commanders of medical units perform an analysis on the impact of accepting additional HN casualties at their facility and make recommendations to the Joint Task Force (JTF) Commander on increasing utilization of their facilities. **(OPR CENTCOM SG)**<br>b. Explore novel solutions and support local efforts for in-theater sustainment training to include increased availability of simulation training and improved "virtual" training platforms. **(OPR CENTCOM SG)** | CENTCOM CDR |
| 75. The CENTCOM Surgeon office is participating in a capabilities-based assessment (CBA) sponsored by the Office of the Joint Staff Surgeon to address medical readiness skills sustainment during deployment operations (MRSS-DDO). Review CBA recommendations when available. | JFS, CENTCOM SG |
| 76. Standardize PI reporting requirements across each role of care with oversight of TMD and TNC in the Area of Responsibility (AOR).<br>a. Establish required reporting mechanism from TMD to JTS and CENTCOM SG and reduce reporting redundancy across commands. | CENTCOM SG |
| 77. Provide additional information on medical record requirements and de-conflict policy with PASBA deployed medical record handbook. | CENTCOM SG |
| 78. Update JTS documentation CPG and increase education on documentation requirements and medical AAR submission. | JTS, CENTCOM SG |
| 79. Update DoDI 6480.40, Armed Services Blood Program Operational Procedures, dated 13 August 2012, incorporating Change 1 effective 2 Oct 2013[12] to prioritize and facilitate delivery of whole blood to deployed prehospital and surgical teams. | ASBPO |
| 80. Improve technical solutions for scanning hand-written records to include a photo-encryption application approved for government phones which automatically generates an encrypted email to JTS. | DHA/Theater Functional Working Group<br>OCR: AT&L/JOMIS |
| 81. JTS create a standard report of records received and report to CENTCOM medical leadership. | JTS |
| 82. CoTCCC review TXA administration guidelines and teaching material. | JTS |
| 83. CoTCCC review antibiotic recommendations, consider more cost-effective solution. | JTS |

## CONCLUSION

Since the drawdown of deployed forces and disbanding of the JTTS in 2014 and the publication of DoDI 6040.46 *Joint Trauma System* in 2016, CENTCOM has transitioned to a COCOM Trauma System led by a dual-hatted trauma medical director assigned to the lead TF MED Role 3 in each theater. At low operational tempo, this structure, combined with periodic trauma system assessments led by JTS, will sustain performance improvement activities within CENTCOM. When operational tempo increases, a forward deployed trauma system team is recommended. Although many opportunities for improvement identified in this report can be addressed at the CENTCOM level, there are also many challenges that extend to the entire DoD and MHS in order to better prepare medical teams deploying to CENTCOM.

Overall, TCCC doctrine and training has advanced in CENTCOM since the last trauma system assessment in 2013. Damage control surgical capabilities have dramatically expanded into a myriad of teams with no standardization and little feedback or reporting with unknown outcomes. Definitive surgical care in theater remains stable with overall excellent processes and performance, although pre-deployment training remains a challenge. Continued efforts to codify and advance the deployed trauma system should progress in CENTCOM. Improved medical documentation is the foundation that supports all performance improvement efforts. The requirement for medical documentation must be facilitated and enforced at all levels of care, for both SOF and conventional force medical care providers, through command emphasis, training, and electronic solutions.

***"Lessons learned are not lessons learned unless you learn them."***

***~Ranger Quote*** [18,19]

# 1.0 PURPOSE

## MISSION

This trauma system assessment of OIR and OFS was requested by the US CENTCOM Surgeon on behalf of the CENTCOM Commander. Included in the trauma system assessment was Role 1 prehospital care, MEDEVAC care, Role 2 forward surgical and resuscitative care, and Role 3 hospital trauma care. The assessment occurred from 30 January to 10 February 2018.

## INTENT

To observe, discuss, record, and evaluate trauma care tactics, techniques, and procedures (TTPs) conducted from point of injury through evacuation out of the CENTCOM area of operations, and to assess compliance with current policies (training, education, evacuation times, team construct). Information from the continuum of care was obtained directly from: deployed prehospital providers (medics, corpsman, MEDEVAC teams, operational physicians), Role 2 and Role 3 physicians, nurses and medics, and theater medical leadership. The overall intent of this assessment was to provide recommendations based on the data gathered to improve the system of care and eliminate preventable combat deaths among all casualties who arrive at any U.S. role of care throughout the continuum of battlefield trauma care.

The primary areas of focus in this assessment were to:

1. identify gaps among each role of care across the DOTMLPF-P domains;
2. identify best practices that can be cross-leveled among the force;
3. identify policy that has been implemented and has directly resulted in the facilitation of best practices; and
4. identify areas of performance improvement that will optimize battlefield trauma care and potentially improve battlefield casualty survivability.

# 2.0 METHODS

The assessment team was comprised of the CENTCOM Clinical Operations (CLINOPS) Director, the JTS Director of Performance Improvement, and the most recent Trauma Medical Director (TMD) from OIR. In order to perform a comprehensive trauma system assessment, four previous CENTCOM trauma system assessments [14,15,16,17] were reviewed. Two online surveys were created (Prehospital/Role 1 and Role 2/3) to better understand capabilities at each role of care and also to identify potential gaps. These surveys were distributed electronically to trauma caregivers deployed throughout CENTCOM one month prior to the site visits. The team traveled to representative sites throughout CENTCOM and conducted on-site individual and group interviews with health care professionals from each military service and civilians across the spectrum of medical units deployed to the Area of Responsibility

(AOR). A qualitative analysis was then conducted on the transcribed notes and a quantitative analysis was performed on the survey results. All data were categorized according to: doctrine; organization; training; materiel; leadership; personnel; facilities, and policy (DOTMLPF-P). Once categorized, the responses to the survey questions and unstructured interviews were organized according to the DOTMLPF-P construct as defined by the JCIDS process,[7, 8] in order to identify and address gaps relating to all aspects of trauma care delivery in CENTCOM. Based on this data, recommendations across the DOTMLPF-P spectrum were made and compiled for the CENTCOM Surgeon.

## DOTMLPF-P

- **Doctrine:** Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application (current best thoughts on the methods by which we deliver prehospital and hospital battlefield trauma care).
- **Organization:** How we provide command and control for medical support operations.
- **Training:** How we prepare medical forces to conduct specified and implied tasks (basic training to advanced individual medical training, unit medical training with casualty care and evacuation exercises).
- **Materiel:** All items necessary to equip, operate, maintain, and support military activities without distinction as to its application for administrative or combat purposes (Tactical Combat Casualty Care [TCCC], medical evacuation [MEDEVAC], Role 1 to Role 3 guideline medical materials).
- **Leadership and Education:** how we prepare personnel to organize and lead medical support operations.
- **Personnel:** Those individuals required in either a military or civilian capacity to accomplish the assigned mission (availability of qualified [technically and tactically/operationally proficient] personnel in the delivery of battlefield trauma care).
- **Facilities:** Real property entities consisting of one or more of the following: building, structure, utility system, pavement, or underlying land. (medical facilities for battlefield trauma care)
- **Policy:** Department of Defense (DoD), interagency, or international policy that impacts the other non-materiel elements.

## CENTCOM Trauma System Assessment Team

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## SUPPORT TEAM: JTS, OIR, OFS, CENTCOM

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- ***Mary Ann Spott, PhD:*** *JTS Deputy Director*
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- ***Frank K. Butler, CAPT (Ret), MC, USN:*** *CoTCCC Chair, JTS*
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- ***Walter M. Matthews, Col, USAF, MC, CFS:*** *TF MED Commander OFS*
- ***Kirby R. Gross, COL, MC, USA:*** *Director Army Trauma Training Detachment*
- ***Edward H. Whitt, DHA Plans:*** *Operations, and Requirements, Operational Medicine*

| Assessment Locations and Level of Care | | | |
|---|---|---|---|
| **Unit** | **Role of Care** | **Location/Theater** | **Date** |
| **75th CSH** | Role 3 | Arifjan, OSS | 30 Jan 18 |
| **MEDEVAC OIR** | En route Care | Arifjan, OIR | 31 Jan 18 |
| **SOJTF-OIR** | Role 1, Role 2 Command Surgeon | Arifjan, OIR | 31 Jan 18 |
| **501st ASMC** | Role 1 | Al Assad, OIR | 31 Jan 18 |
| **Coalition FST** | Role 2 | Al Assad, OIR | 1 Feb 18 |
| **C Company 1/189th, DUSTOFF** | Role 1, MEDEVAC | Al Assad, OIR | 1 Feb 18 |
| **47th CSH** | Role 3 | Baghdad, OIR | 2 Feb 18 |
| **501st ASMC** | Role 1 | Erbil, OIR | 2 Feb 18 |
| **Canadian/German Surgical Team** | Role 2 | Erbil, OIR | 2 Feb 18 |
| **217/1st Cavalry Division** | Role 1 | Erbil, OIR | 2 Feb 18 |
| **JMAU/SRT** | Role 2, En route care, Surgical team | Erbil, OIR | 2 Feb 18 |
| **S. Dakota NG DUSTOFF** | Role 1, MEDEVAC | Erbil, OIR | 2 Feb 18 |
| **Navy EMU** | Role 2 | Q West, OIR | 3 Feb 18 |
| **710 BSB, 3/10 MTN** | Role 1 | Q West, OIR | 3 Feb 18 |
| **3/10 MTN** | Role 1, BDE SG | Q West, OIR | 3 Feb 18 |
| **C-1/189 Oregon NG** | Role 1, MEDEVAC | Q West, OIR | 3 Feb 18 |
| **Craig Joint Theater Hospital** | Role 3 | BAF, OFS | 5 Feb 18 |
| **RS PECC, OIC** | Patient movement | BAF, OFS | 5 Feb 18 |
| **C 2-3 Aviation BDE, DUSTOFF** | Role 1, MEDEVAC | BAF, OFS | 5 Feb 18 |
| **3/75 Ranger BTN** | Role 1 | BAF, OFS | 5 Feb 18 |
| **AE/CCATT** | En route care | BAF, OFS | 6 Feb 18 |
| **2-501st Parachute Infantry RGT** | Role 1 | BAF, OFS | 6 Feb 18 |
| **1st BCT and 4-3 Assault Helicopter BTN** | Role 1 | BAF, OFS | 6 Feb 18 |
| **455 Expeditionary Rescue Squadron, Pararescue** | Role 1 | BAF, OFS | 6 Feb 18 |
| **2 BTN/10th Special Forces Group** | Role 1 | BAF, OFS | 6 Feb 18 |
| **SOJTF-A** | Role 1, Role 2 CMD SG | BAF, OFS | 6 Feb 18 |
| **555 FST** | Role 2 | JAF, OFS | 7 Feb 18 |
| **7-25 BDE support BTN** | Role 1 | JAF, OFS | 7 Feb 18 |
| **501st Infantry BTN** | Role 1 | JAF, OFS | 7 Feb 18 |
| **C 2-3 Aviation BDE, DUSTOFF** | Role 1, MEDEVAC | JAF, OFS | 7 Feb 18 |
| **OGA medics** | Role 1 | JAF, OFS | 7 Feb 18 |
| **933 FST** | Role 2, GHOST | Dahlke, OFS | 8 Feb 18 |
| **2 BTN/10th Special Forces Group** | Role 1 | Dahlke, OFS | 8 Feb 18 |
| **C 2-3 Aviation BDE, DUSTOFF** | Role 1, MEDEVAC | Dahlke, OFS | 8 Feb 18 |

| Assessment Locations and Level of Care | | | |
|---|---|---|---|
| **Unit** | **Role of Care** | **Location/Theater** | **Date** |
| **1st FST** | Role 2, GHOST | KAF, OFS | 9 Feb 18 |
| **10th Special Forces Group** | Role 1 | KAF, OFS | 9 Feb 18 |
| **FRSS (teleconf)** | Role 2 | Dwyer, OFS | 9 Feb 18 |
| **1st Med BTN (teleconf)** | Role 2 | Shorab, OFS | 9 Feb 18 |
| **3rd ID Combat Aviation BDE, C 2-211 GSAB Det 1, DUSTOFF** | Role 1, MEDEVAC | KAF, OFS | 9 Feb 18 |
| **NATO Role 3** | Role 3 | KAF, OFS | 9 Feb 18 |
| **JMAU Surgical Team** | Role 2, En route care, Surgical team | BAF, OFS | 11 Feb 18 |

# 3.0 FINDINGS

**DOTMLPF-P Analysis**

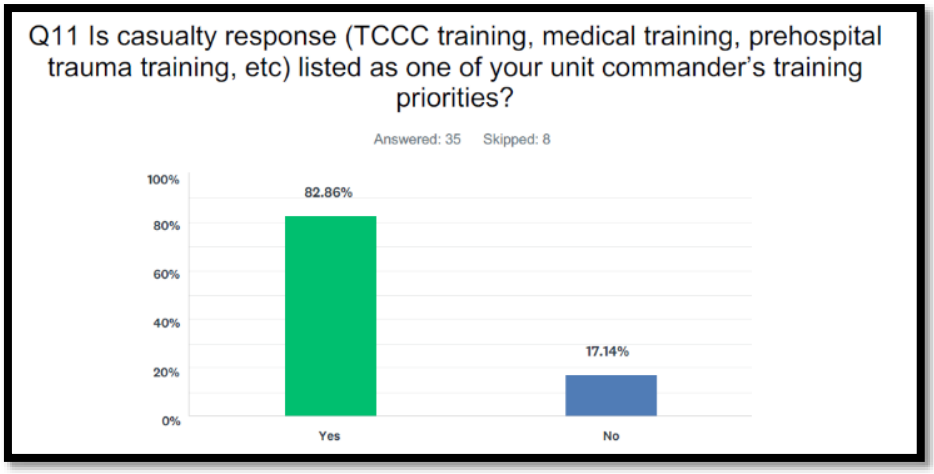
# 4.0 DOCTRINE

- The primary doctrinal publication for health services support to U.S. military operations is Joint Publication 4-02, Joint Health Services, dated 11 December 2017.[17] Although this publication only provides cursory reference to trauma systems and their functions, it does outline responsibilities of the Joint Force Surgeon to include: "provide for a combatant command trauma system and trauma care policy and planning" in accordance with DoDI 6040.47, Joint Trauma System (JTS), dated 28 September 2016.[1]
- According to DoDI 6040.47, the **functions of a CTS include**:
    1. Enable accurate and timely entry of casualty and trauma care data into the Department of Defense Trauma Registry (DoDTR) or current DoD system of record.
    2. Develop, assess, and recommend best practices in treating traumatic injuries, including clinical practice guidance and TCCC Guidelines adapted to the medical mission requirements.
    3. Assist in identifying trauma-care-related requirements for education and training, research, informatics, and operations.
    4. Support the timely reporting of casualty care and trauma-related metrics.
- Central Command Regulation (CCR) 40-7, Clinical Operations Program, dated 6 Mar 2017,[6] formalized the Combatant Command Trauma System (CTS) for the CENTCOM theater. In general – the functions and **characteristic of a trauma system** include:
    1. Delivery and documentation of trauma care.
    2. Assessment (collection and analysis of injury data).
    3. Performance improvement using the data obtained from the system.

4. Policy development (using the results of the assessment in an organized manner to establish comprehensive policies and standards to improve injury care and population health).
5. Assurance by monitoring to ensure that policies and standards are being upheld.
6. Verification of units and teams within the system to ensure the requirements established are being met.

- Initially formed in 2004, and sustained during continuous combat operations to present date, the U.S. CENTCOM CTS is currently the most advanced combat trauma system in the world. However, within CENTCOM, the functions of a trauma system are divided among several organizations and the ability to monitor compliance and ensure synchronous activity within the system is limited.
- Data compiled from multiple interviews and survey questions demonstrate confusion regarding the following elements in support of CENTCOM objectives:
    1. Damage Control Surgery (DCS) capabilities
    2. The minimum required capability for a Role 2 surgical team
    3. The Golden Hour Policy and a true surgical capability within 60 minutes from point of injury

## PREHOSPITAL/ROLE 1




For more than a decade, guidelines provided by TCCC have unofficially been the accepted standard for providing prehospital combat trauma care by U.S. military forces. Recently, TCCC has become the official standard for U.S. military forces as directed by DoDI 1322.24, Medical Readiness Training.[5] Almost every Role 1 unit contacted in CENTCOM had undergone TCCC training and 83% of teams responded that TCCC training was a top priority. 74% indicated that the commander fully understood and supported TCCC guidelines, 23% indicated they somewhat supported and <3% indicated lack of command support for TCCC. While the goal is 100%, the fact that <3% of the units have lack of command support is an improvement from the last CENTCOM assessment in 2013 in which the report read:[15]

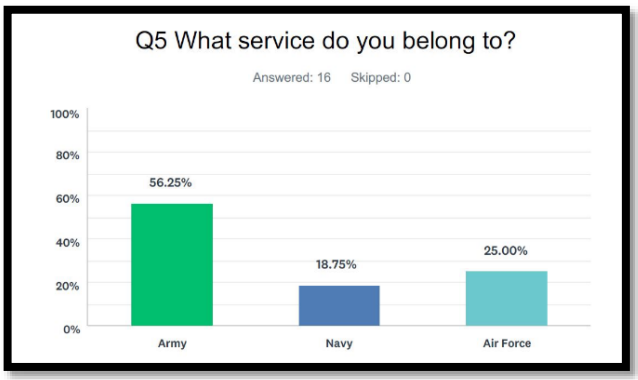
1. *The lack of standardized TCCC capability in combat units as well as use of TCCC training materials that have not been approved by the JTS may lead to incorrect messaging in TCCC training and may represent a causal factor for the increased killed in action, case fatality rate, and preventable deaths seen in conventional forces when compared to special operations forces.*
2. *Absent a validated joint requirement which is captured doctrinally, the prevailing resource-constrained environment will challenge Services to fully Organize, Train, and Equip to TCCC standards.*

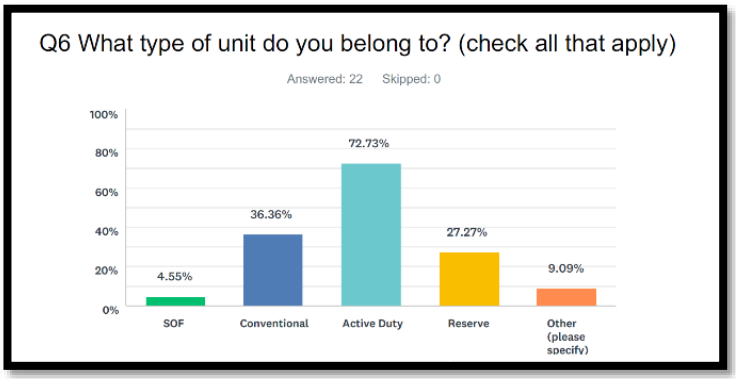
## MEDEVAC

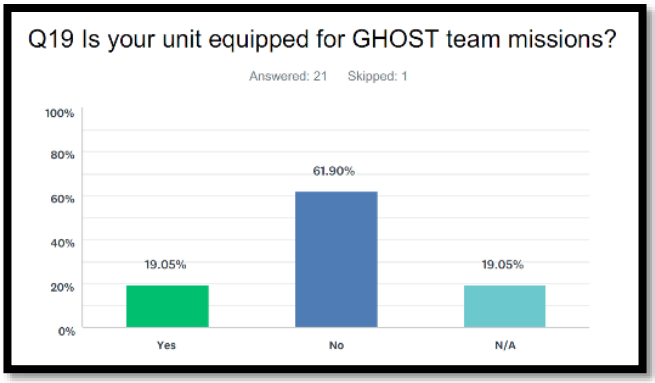
U.S. Army MEDEVAC units have not indoctrinated a 2-medic capability. All MEDEVAC medics agree that 2 medics on the lead aircraft is a needed capability that improves their ability to deliver trauma care to critical patients. MEDEVAC teams have developed several work-around methods to ensure that two medical providers are available on the lead aircraft— some locations had adequate manning to support two flight medics, other locations utilized ECCNs when available, and in several locations, a 68W medic from the Role 2 was designated as a "Guardian Angel" with a primary mission to provide security and a secondary mission to assist the flight medic.

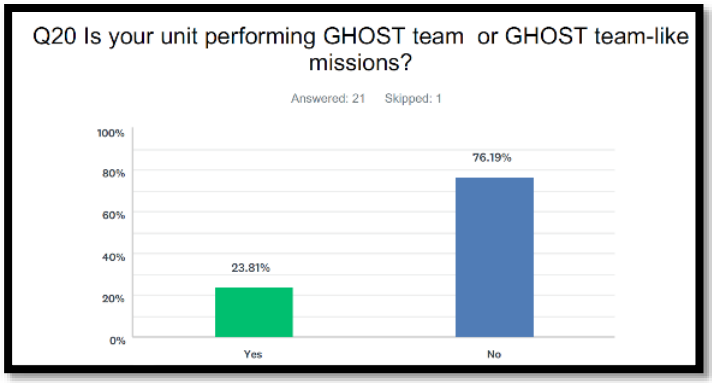
## ROLE 2

- There are Role 2 surgical units somewhat equally dispersed throughout Iraq, Syria and Afghanistan. Of the 16 Role 2 facilities that answered the survey, 5 were deployed to each country. Role 2 surgical care is covered by the Army, Air Force and Navy. There are nine Army, three Navy and four Air Force Role 2 facilities identified by the survey.
- The survey also included non-U.S. coalition Role 2 facilities of which there were three represented in OIR. The majority of units were Active Duty 72%, with 36% conventional and 5% SOF; 27% were Reserve; 9% were 'other' to include the non-U.S. coalition and multinational Role 2 facilities.
- The assessment identified significant gaps in doctrine in regard to damage control surgery (DCS) capabilities. Current doctrine does not differentiate between the surgical Role 2 area support and Role 2 mission support.
- Role 2 area support is the practice of providing damage control surgical resuscitation capability within an identified area of coverage associated with MEDEVAC response.
- The current practice of using small surgical teams to extend "Golden Hour" coverage lacks a clear doctrinal definition and is perceived by surgical teams to be misused by line leadership to provide an illusion of a surgical capability.
- Some Role 2 units are currently asked to perform 'ad hoc' missions for which they were not designed and have limited training. Forward surgical teams (FSTs) assigned to Special Operations Joint Task Forces (SOJTF-S and SOJTF-A) are asked to split into Golden Hour Offset Surgical Teams (GHOSTs). Although this mission has existed for at least 5 years, the teams have not received formal training for their mission, and






have to learn how to pack and move on SOF platforms and perform damage control interventions in austere locations without the benefit of support staff, often with no experience with this mission until arrival in theater.

- While almost 70% of the units are not equipped to perform GHOST team missions, 25% of Role 2 units in OFS and 50% of Role 2 units in OIR-Syria are performing these Golden Hour offset missions. Of all the Role 2 and Role 3 MTFs deployed, 26.7% indicated they are tasked to perform GHOST-team missions. Currently, outcome data is lacking from these missions as a dual function of very low patient volume and also challenges in getting any records or data to the JTS.
- On a broader spectrum, one of the challenges in CENTCOM is that there is not a consistent definition of Role 2 surgical care – as evidenced by the above GHOST Team missions. Most Role 2 units are no longer functioning as originally designed. For example almost all FSTs in CENTCOM are operating as split units but many of their personnel have one authorization which creates gaps in patient care (an FST only has one surgical nurse, one surgical technician, one ER nurse). The Navy Role 2 at Q-West, Iraq was representative of a doctrinal Role 2-Enhanced surgical team and was not able to be split per Navy Central Command (NAVCENT) policy. Air Force 6-person Ground Surgical Teams (GST) were designed to cover Role 2 mission support, however are deployed to provide Role 2 area support in CENTCOM.
- A lack of standard definitions for DCS capabilities creates substantial difficulties for medical planners in matching surgical capability to mission requirements because the Role 2 capability can range from a 5-person special operations team to a 30-person Expeditionary Medical Unit with variability between the Services. The recently updated JP 4-02 does not adequately clarify the definition of a Role 2.
- Additionally, the Army continues to use the term Role 2 to refer to enhanced medical, but non-surgical, capabilities such as dental, mental health, and physical therapy, which causes confusion with the NATO Role 2 definition and conflicts with the JP 4-02 definition of Role 2 care that includes, “at a minimum may conduct damage control surgery.”[17]

## ROLE 3

- The role of the Trauma Medical Director (TMD) has been adopted throughout CENTCOM.
- At the Air Force Role 3 in Bagram, Afghanistan, the position that was originally termed “trauma Czar” has now been separated into two positions, one still referred to as Trauma Czar is the TMD for Craig Joint

Theater Hospital, and the second position held by the TF MED-A Deputy Commander for Clinical Services is the designated TMD for TF MED-A.

- The TMD position became codified in the Army Role 3 when it was re-established at BDSC, with one trauma surgeon serving as both the TMD for the Role 3 and the entire TF MED-OIR.
- 90% of survey respondents indicated that they knew how to contact the TMD – the two that did not were in OFS and may only know that position as the Trauma Czar instead of TMD as the question was asked. Additionally, 100% of teams indicated they had trauma clinical leadership.
- The Role 3 facilities in OFS and OIR, and Role 2 units in OIR-Syria and OFS have been tasked to support "damage control surgical teams" that are forward deployable. However, the leadership is not clear on what exactly is a damage control surgical team — there is no doctrine or definition available, and none of the DCS teams have received any standardized training specific to the mission, and standardized equipment sets are not available. While Camp Arifjan, Kuwait does have contingency staffing to support such a mission, deploying such a team from Craig Joint Theater Hospital (CJTH), Afghanistan would significantly degrade the Role 3 capability.

# 5.0 DOCTRINE: SUMMARY

- Doctrinal support of TCCC has increased substantially since 2013.
- Medical and non-medical leader support of TCCC and the JTS has increased throughout CENTCOM.
- All units indicated that there was leadership support for trauma documentation and getting data into the DoDTR and that they were aware of the mechanisms.
- Notable were many comments regarding challenges with medical records in the deployed environment (more details under "Materiel").
- Current doctrine supports the requirement for trauma records to get uploaded into the DoDTR; however, this continues to be challenging for all units. The most consistent group for documentation was the MEDEVAC team who report >90% of their Patient Care Reports (PCRs) getting sent to the JTS.

# 6.0 DOCTRINE: RECOMMENDATIONS

1. Strengthen support for accurate and timely collection of medical data into the DoDTR through doctrine, materiel capabilities, and ongoing assessment of compliance with established COCOM policies. (OPR CENTCOM SG)
2. Improve cooperation between the Joint Force Surgeon (JFS), CENTCOM Surgeon, and JTS in regard to doctrine development.
    a. Maintain a trauma clinical specialist at JFS office as liaison to the JTS and COCOM trauma systems. (OPR JFS)

b. Increase trauma clinician and trauma system specialist involvement in CENTCOM medical planning. (OPR CENTCOM SG, OCR JTS)

c. JTS review of CENTCOM theater-entry medical training requirements. (OPR CENTCOM SG, OCR JTS)

d. Increase assessment of compliance with established policies, particularly:

i. Theater-entry medical training requirements. (OPR CENTCPOM SG)

ii. Medical documentation and availability to DoDTR.[10,6] (OPR CENTCOM SG)

3. Update JP 4-02 to provide an accurate common definition and architecture of Role 2 medical units. (OPR JFS)

a. Recommend adopting Role 2 "area support" for traditional units (FST/FRST, split-FST/FRST, EMU, ASMC) and Role 2 "mission support" for small surgical teams (SOST, SRT, GST, GHOST, etc) designed to extend "Golden Hour" coverage.

b. Clarify Role 2 definition to include the three subcategories or Role 2: (1) light maneuver/mission support, (2) area support with limited capability, and (3) area support with enhanced capability.

4. Update MEDEVAC doctrine (Army Techniques Publication 4-02.2) to support two medic manning of designated MEDEVAC platforms; train and man units accordingly. (OPR U.S. Army Combined Arms Center and AMEDDC&S)

# 7.0 ORGANIZATION

## PAST AND PRESENT TRAUMA SYSTEM ORGANIZATION IN CENTCOM

- There is no longer a deployed Joint Theater Trauma System (JTTS) team in CENTCOM. Since the last CENTCOM trauma system assessment, the JTTS team was withdrawn from Iraq at the conclusion of Operation Iraqi Freedom, and was redeployed from Afghanistan without replacement at the conclusion of Operation Enduring Freedom. As a mitigating factor, and in accordance with the DoDI 6040. 47, *Joint Trauma System* (JTS),[1] CENTCOM designated a Trauma Medical Director for each theater (OIR and OFS), defined as the lead Role 3 senior trauma surgeon for the region.
- The entire JTS organization, previously an informal project within the Army Institute of Surgical Research, was realigned as a directorate of the Army Medical Research and Materiel Command according to the 2016 JTS DoDI and will move to the Defense Health Agency Operations directorate in 2018 in accordance with National Defense Authorization Act Fiscal Year 2017[2] requirements. This move and the associated requirements address the top recommendation identified in earlier trauma system assessments conducted in conjunction with American College of Surgeons representatives in 2010 and 2011:

  Establish the JTS as the statutory lead agency with DoD authority to set policy and enforce standards of excellence in the care of the injured. Compliance with policy and standards should be assured by a systems verification process. This should also serve as a metric for component leadership evaluation and reporting.[13, 14]

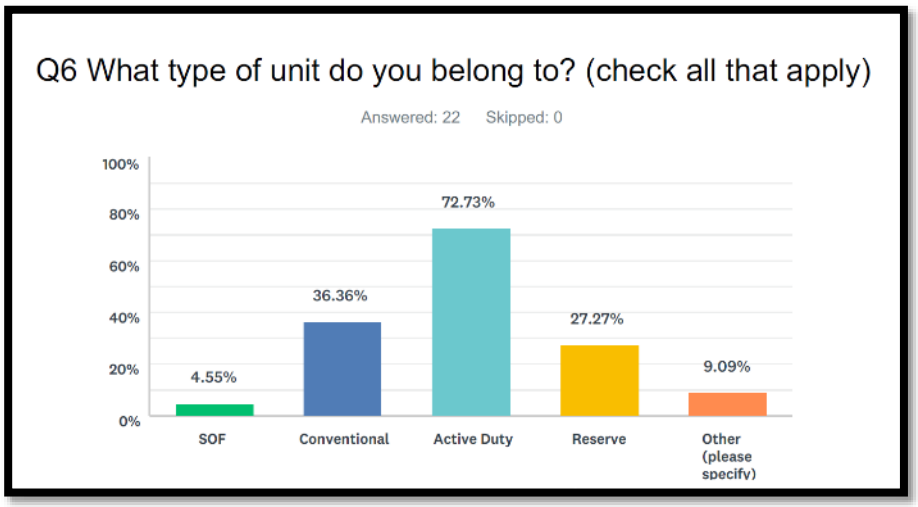
- The JTS will be the DoD delegated authority to recommend external system review.
- The JTS will be elevated within the DoD in order to more effectively align its position with its joint and global responsibilities.
- The CTS was further defined in CCR 40-7: The CTS is a regional trauma system that is scaled to meet mission requirements identified by the COCOM. CTS staffing is a flexible system of trauma care specialists that provides the Combatant Command with in-theater casualty and trauma care expertise.[6]
    1. The CENTCOM Surgeon designates regional CTS directors as required.
    2. During low intensity operations this position is designated to the lead Role 3 senior trauma surgeon.
    3. When operations exceed the ability of in-theater assets to meet CTS responsibility, the TF Surgeon may submit a Request for Forces (RFF) through CENTCOM SG for the deployment of a CTS cell to help enforce the requirements set forth in the CTS guidelines and help ensure appropriate adherence to theater guidelines.

## COMMAND AND CONTROL (C2)

The survey results demonstrated strong sustains in terms of the C2 in areas of medical support operations:

1. 100% of units responded that the MEDROE are clearly understood by leadership.
2. All units/MTFs conduct AARs after MASCAL exercises and patient care events.
3. All deployed units reported relationships with multiple medial support elements:
    a. >95% worked with MEDEVAC
    b. >90% worked with base support elements for transports of non-US military patients
    c. >85% worked with medical coalition units
    d. >80% worked with the Blood Support Detachment
    e. >66% worked with Host National Medical elements
    f. >47% worked with En Route Critical Care Teams
4. 91% of Role 2 and Role 3 MTFs indicated they received timely notification regarding incoming casualties
    a. 5% indicated that they have very short notice because casualty transport from point of injury is short; they also indicated that the timing was not accurate.
    b. Although notification was “timely” it was rarely accurate.

5. 71% of Role 2 and Role 3 were aware of the Commander's Critical Information Requirements (CCIR), 14% indicated there were no CCIR and 14% were unsure.




## ORGANIZATIONAL SHORTFALLS

- There is no single medical command in CENTCOM. Responsibility for medical operations and C2 is shared amongst a myriad of organizations (ARCENT, MARCENT, NAVCENT, AFCENT, TF MED, CJFLCC, SOJTF, CJTF-OIR, USFOR-A and OSS) with competing interests.
- Many teams are subject to a complex mix of command structures covering OPCON, TACON, ADCON and support relationships enabling a diffusion of responsibility and inability to problem solve.
- This results in duplicate efforts and confusion regarding decision-making and responsibility.
- Due to the complex organizational structure, there is little coordination of medical planning between various organizations in CENTCOM, resulting in suboptimal distribution of medical assets in theater.

  Examples:

  1. One FST in OIR-S is OPCON to TF MED and TACON/ADCOM to SOJTF and when attempting to solve logistical problems, it was uncertain who was responsible.
  2. During the assessment, there were 2 Army FSTs in Syria – one Active Duty and one US Army Reserve. Both were conventional FSTs that were supporting SOJTF missions. Teams reported they could be in situations where they are "orphans" when it comes to logistical support (pharmacy / Class VIII). The C2 of these teams was confusing for the team and made basic logistical support very challenging.
  3. A Navy surgical team in OIR is OPCON to NAVCENT and supported by TF MED and was unable to solve logistical and travel problems due to uncertainty regarding who was responsible.
  4. The Role 3 at Kandahar Airfield (KAF) had difficulty replacing their aging sterilization capability because there are questions about who is responsible for funding and overseeing the project (NATO vs. Army vs. Navy).

5. An Air Force GST was OPCON to AFCENT, supporting SOJTF missions, but logistical support was supported by TF MED without formal command relations.
6. SOJTF-A GHOST team at OP Bravo was an 8-minute flight from the TF MED-A split FST at forward operating base (FOB) Fenty, with the GHOST team positioned to support ground casualty evacuation (CASEVAC) during inclement weather. The two task forces in control of Role 2 surgical assets did not fully coordinate the positioning of teams.
7. The German Role 2 facility at Safe Haven was collocated with a GHOST team at Pamir. The two coalition partners did not fully coordinate the positioning of teams.
8. Hamid Karzai International Airport (HKIA) is a redundant capability and well within BAF medical reach. Even with recent events in Kabul (hotel attack and vehicle-borne improvised explosive devices) there were only 2 non-urgent CASEVAC to that location and the remainder were taken to BAF.

## ROLE 2/3 TURNOVER

- There is no standardized systemic method for team replacement.
- The Air Force Role 3 members typically deploy individually from different home-station units.
- For the Air Force, a potential lack of cohesion is mitigated by a "rolling turnover" in which personnel rotate in and out of theater in a staggered manner in order to maintain continuity.
- Army units typically maintain a home-station unit, however that unit does not include providers and training is mostly focused on facility management and movement and may not incorporate a patient care mission.
- Turnover of Army units includes a short "right seat, left seat" overlap.
- The Professional Filler (PROFIS) positions for Army physicians are extrinsic to the units they support which results in a lack of physician leadership. PROFIS providers may not attend pre-deployment training with the unit they are assigned to and may deploy for a shorter length of time than the rest of the unit.
- Navy units may follow either model, however the larger teams are drawn from multiple home-station locations.
- Navy pre-deployment training is more standardized and is lengthy, incorporating 3 weeks of combat skills training and 3 weeks of trauma training at the Navy Trauma Training Center (NTTC), and their in-theater turnover includes a short "right seat, left seat" overlap for the entire team.
- Overall the organizational turnover is not coordinated within the Services or between the Services and CENTCOM.

## COORDINATION

- There is little to no synchronization of the medical effort on bases. In many cases, Role 1, Role 2/3, and MEDEVAC assets operate independently and report through different chains of command; they rely on informal personal relationships to problem solve at the local level. That being said – the "local solution" is training and 67% of units conducted training with MEDEVAC and 95% report a relationship with MEDEVAC to help overcome this organizational gap.
- The majority of larger bases with EMS use contracted services. These contracted services have little or no contact or integration with military treatment facilities on the same base. These relationships need better definition, such as under what medical direction contract EMS personnel operate. Additionally, some forward bases do not have an organized base-wide emergency response plan for on-base emergencies.
- The lack of a single organization with accountability for medical assets leads to gaps in medical coverage, confusion, and lack of clinical oversight.
- FOB Erbil demonstrated a best practice with a weekly meeting of all medical elements on the base that was international and included all roles of care (Role 1, MEDEVAC, Role 2).
- Some Role 1 Aid Stations are staffed only by medics (68W10). One Aid station was without a provider for 2 months because the provider went to Kuwait to perform Post Deployment Health Assessments. The other Aid Station was without any provider because only a small portion of the unit was forward-deployed and the provider stayed in Qatar with the majority of the unit.
- There are gaps in coordination between units allocated to SOF and conventional forces. The 933 FST is configured with three GHOST teams under SOJTF so it causes confusion with administrative support, logistics, and clinical oversight. Conventional units in close proximity to SOF units expressed concern that they want better coordination with SOF when they conduct missions nearby and they feel SOF planners do not understand the capabilities of the Role 2.
- Conventional FSTs assigned to support special operations are supervised by SOF operational physicians. They report that there is not a good relationship with the GHOST teams—the majority of teams are not trained for the mission and the quality of providers is variable, especially surgeons and CRNAs. One surgeon (colorectal) refused to do surgery. Usually the GHOST mission is a shock to them when they get into theater. "We make the best of a crappy situation."
- SOF personnel expressed their preference for SOF-trained medical support such as surgical resuscitation team (SRT) and special operations resuscitative teams (SORT) over GHOST. They stated the GHOST was not as flexible at meeting their needs as the other resuscitation teams.

## PATIENT MOVEMENT

- Coordination of patient movement is not standardized, and occurs differently in OFS, OIR-I, and OIR-S.
- When MEDEVAC and AE patient movement functions are consolidated, particularly when the options of fixed and rotary wing evacuation are both available, patient movement missions can be transferred to the

most optimal air asset for each mission. This is not currently happening in OIR. Additionally, the MEDEVAC patient movement cell (PMC) is located in separate locations for OIR-I and OIR-S, even though there is patient movement across the two regions. The AE evacuation team was previously co-located with the PMC in Baghdad, however was moved to Kuwait, but in the near future, will move back to Baghdad PMC.

- It is not clear why the different patient movement functions are not co-located and well-coordinated for OIR as they are for OFS. In Afghanistan, there is a single patient evacuation control cell (PECC) for all of Resolute Support (to include U.S. and NATO MEDEVAC as well as AE). The PECC coordinates 9-line MEDEVAC movements and also coordinates fixed wing movements with the Theater Patient Movement Requirement Center (TPMRC).
- CASEVAC is by definition an unregulated patient movement. At all locations, casualties may occasionally arrive without notice by CASEVAC although efforts are made to notify the receiving surgical teams by communication through their corresponding operations centers.
- Amongst the teams interviewed there is a perception that AE is too slow in theater and for evacuation out of theater. The AE urgent transfer movement requirement is 12 hours to reach destination. There is a clear disconnect: the teams/end users think that fixed wing patient movement standards are too slow, especially when the patient's needs exceed available resources; on the other hand, the AE approving (and tasking) authorities think the patient movement standards are acceptable and the system is doing a great job moving patients with the resources available. Thus, there is a disconnect of expectations between AE and their customers.
- The BAF EAE squadron commander states that the differences in expectations may be caused by knowledge deficits and lack of situational awareness.
- The customer/end user may not understand the limitations of available lift or the priorities of cargo movement which may take precedence over patient movement.
- Tasking and approval authorities may not understand the available resources of the customer, especially during times of crisis.
- There is a training deficit on the procedures for getting a patient into the AE system and the process by which a patient is validated for movement.
- U.S. Transportation Command (TRANSCOM) has worked to speed up this process to include an expedited patient movement request (PMR) capability and expedited approval process for urgent and priority patients.
- There is no fixed wing aircraft dedicated to patient movement full time, however operational support can be requested to provide 1-hr and 3-hr alert status when needed.
- The expedited AE PMR process is not well known in theater, especially Iraq.

# 8.0 ORGANIZATION: SUMMARY

- The CTS has replaced the JTTS with designated Trauma Medical Directors intrinsic to the Role 3 facilities.
- There is no single medical command in CENTCOM. Responsibility for medical operations and command and control (C2) is shared amongst a myriad of organizations resulting in a diffusion of responsibility and inability to effectively solve problems and make decisions.
- There is no standardized and systemic method for medical team replacement.
- There is little to no synchronization of the medical effort on bases.
- There are gaps in coordination between units allocated to SOF and conventional forces.
- Coordination of patient movement is not standardized, and occurs differently in OFS, OIR-I, and OIR-S.
- Patient movement is best coordinated when MEDEVAC and AE patient movement functions are consolidated.
- The role and mission of damage control surgery (DCS) teams embedded within Role 3 MTFs needs to be clarified and these teams must be trained and equipped for the mission.

# 9.0 ORGANIZATION: RECOMMENDATIONS

1. Support Joint Requirements Oversight Council Memo 125-17, Forward Resuscitative Care in Support of Dispersed Operations DOTMLPF-P Change Recommendation by Joint Force Surgeon.[11] (OPR JFS)
2. Consolidate command and control of tri-service medical elements and define roles of responsibility. (OPR CENTCOM SG)
    a. Clarify Chain of Responsibility for all Role 2 elements in CENTCOM, particularly in regard to logistic support.
    b. Designate regional TMD for each theater (OFS and OIR), mandate pre-deployment trauma system training with the JTS for this position, and empower this position with CENTCOM authority to oversee all trauma care in theater.
    c. Support TMD in each theater with appropriate support staff: TNC and administrative support element.
3. Create a formal trauma system pre-deployment course. (OPR JTS)
4. Build a CENTCOM integrated medical planning cell to synchronize efforts and optimize medical coverage between SOF and conventional forces. (OPR CENTCOM SG and SOCOM SG)
5. Mandate base operational support and integration (BOS-I)/mayor cell/base leadership to develop a Senior Medical Council on each compound to coordinate medical efforts, enforce on-base emergency response plan, and prevent gaps in provider coverage. (OPR CENTCOM CDR)

6. Consolidate intra-theater fixed and rotary wing patient movement coordinators into a single location and ensure that cross communication occurs to assign the most efficient evacuation platform, particularly for intra-theater transfer missions. (OPR CENTCOM CDR)

    a. Ensure a single point of contact to initiate all patient movements from any location.

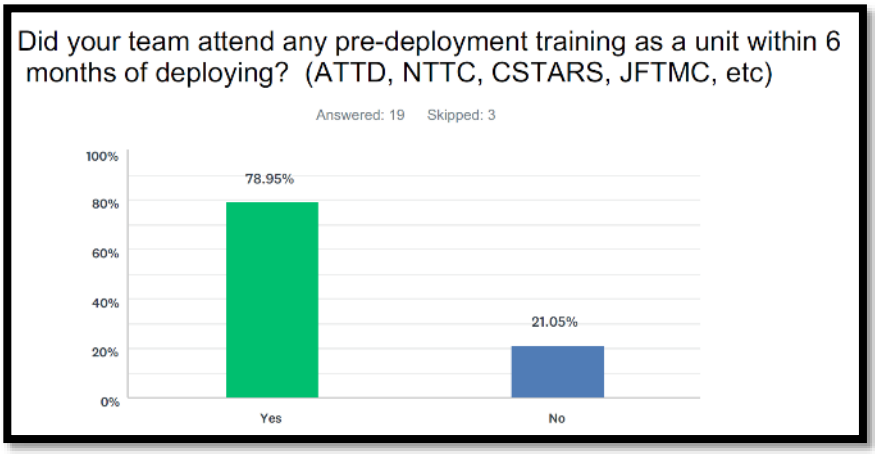
7. CENTCOM surgeon and regional trauma medical directors verify on-base emergency response plans and mass casualty (MASCAL) plans for all forward bases and ensure that such plans are rehearsed regularly. (OPR CENTCOM SG)

8. Clarify role and mission of DCS teams embedded within Role 3 MTFs and ensure teams are trained and equipped for the mission. (OPR SERVICE SGs)

# 10.0 TRAINING

## MANDATORY TRAINING

Medical training that has been designated as mandatory for theater entry is frequently waived or simply not completed.




## PRE-DEPLOYMENT TRAINING

Summary of survey comments regarding pre-deployment training were as follows:

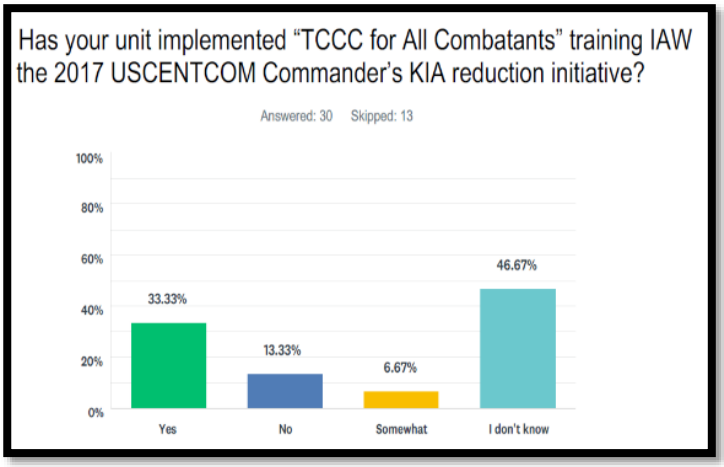
1. Military-specific training was required, but medical-specific training was not required.
2. Most Army PROFIS did not attend the Army Trauma Training Detachment (ATTD) course.
3. Except for physicians, most Navy team personnel attended training at the Navy Trauma Training Center.
4. Resuscitative Endovascular Balloon Occlusion of the Aorta (REBOA) training at Baghdad was the only medical training received for many.
5. Air Force team personnel received Austere Surgical Training in Baltimore and San Antonio.
6. Is Advanced ATLS training a requirement? PROFIS providers were NOT identified prior to deployment in order to do their training. Some PROFIS providers received less than 2 weeks' notice prior to deployment, so therefore could not conduct training. Two PROFIS providers were in fellowship (orthopedics and general surgery) immediately prior to deploying and could not attend training. Two out of three Emergency Medicine physicians had ATLS courses scheduled through the Army Training Requirements and Resources System (ATTRS); however, ATTRS was not flexible enough to get providers scheduled for training given the short notification time prior to deploying. Required training must be able to accommodate short notice

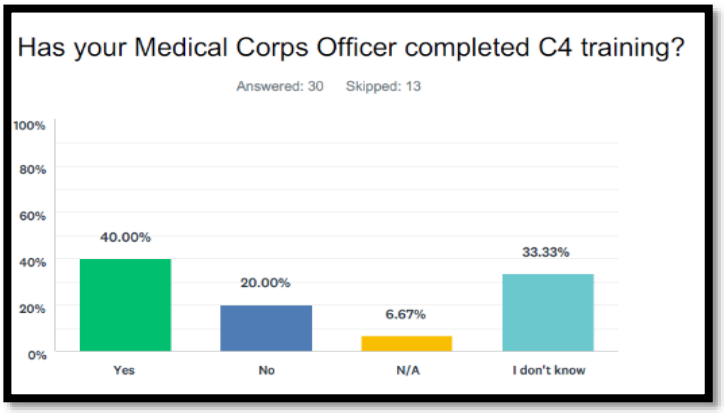
deployments and deployments that occur immediately after residency graduation. ATTRS is not flexible and another system (or system overrides in ATTRS) should exist to ensure required training occurs prior to deployment.

7. The Joint Forces Combat Trauma Management course (JFCTMC) is a requirement for Role 3 providers; however, only 50% of providers attended the course. Most surgeons do not attend this course because the Emergency War Surgery Course runs concurrently and the surgeons are at EWSC during the JFCTMC lectures.

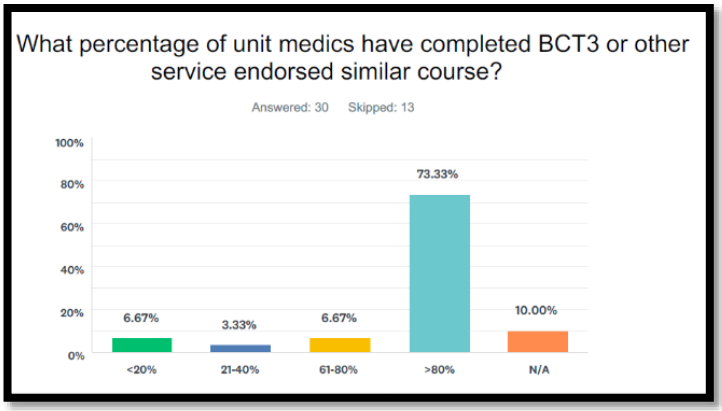
## TCCC AND PREHOSPITAL TRAINING

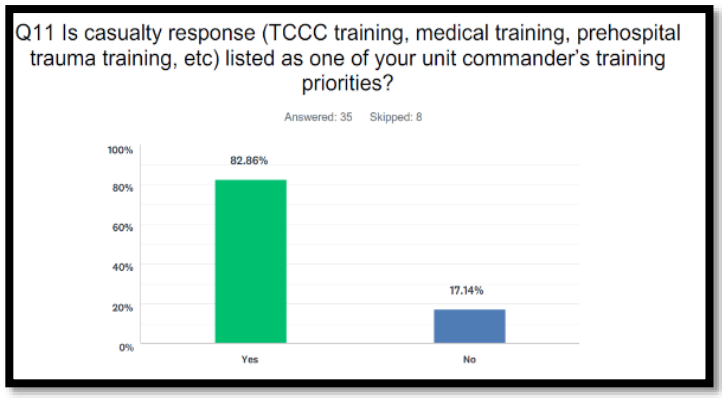
- A notable success identified during the assessment was that TCCC and its principles were deeply engrained in all medics/corpsmen as well as the majority of physicians supervising medics/corpsmen. With few exceptions, Role 1 physicians attended the Tactical Combat Medical Care Course (TCMC), which includes TCCC training within the curriculum, prior to deployment. Several physicians did report challenges getting scheduled for TCMC, including canceling and rescheduling multiple times and difficulty getting an available training slot.
- Almost three quarters of those surveyed indicated that 80% of the unit had attended Brigade Combat Team Trauma Training (BCT3); however, 10% of the population did not have BCT3 training and another 10% stated it was not applicable.
- TCCC for All Combatants was implemented in CENTCOM in March 2018.

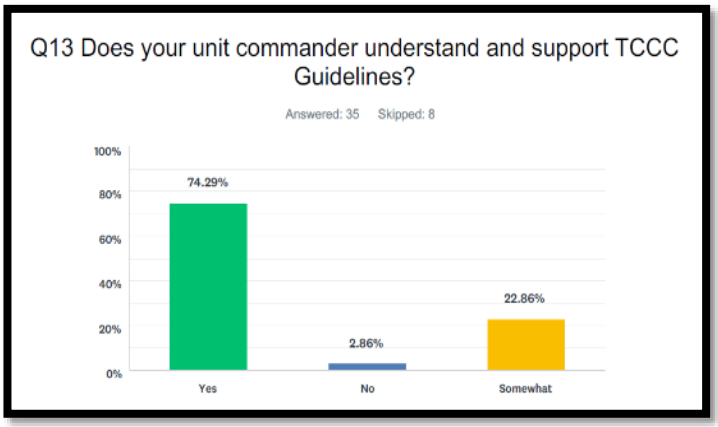


- The prior standard first aide course for the Army and Navy was combat life-saver, for the Air Force self-aide buddy care. Recent informal reviews of service TCCC-related courses by JTS personnel indicates substantial variation from and incomplete presentation of TCCC concepts.
- All medics interviewed attended BCT3, or TCMC for senior medics, prior to deployment. These courses cover the entire TCCC curriculum and implement TCCC training in realistic simulation scenarios.
- Several medics reported a concern that the only airway intervention being taught at BCT3 is cricothyroidotomy. There is no emphasis on positioning and non-invasive airway management. They are teaching a low threshold for cricothyroidotomy.
- Although most Role 1 physicians and PAs attended TCMC, there are still some physicians and PAs assigned to both SOF and conventional Army units who may not attend a formal TCCC training course.
- TCMC is required for conventional Army units, but may not be required for SOF physicians. However, the physicians do participate in team training events.




- Role 1 medics from 2-501 Parachute Infantry Regiment, Ft Bragg, 1st BCT and 4-3 AHB (Assault Helicopter Battalion), HAAF assigned to TF Geronimo and TF Brawler, BAF report a new initiative for conventional forces to develop aid and litter teams who have EMT-B training (30-day course) for several non-medics in each platoon, however few have this currently.
- They also report that no medics spent any clinical time in the Emergency Department before deployment, only in the clinic.
- Three NCOs did attend paramedic training.
- Medics stationed at Fort Bragg are frequently required to provide Drop Zone (DZ) coverage when at home station. They are also on standby for Global Response Force (GRF). Although commitments such as these must be covered by medics, leaders need to also make time available to these medics for emergency room, hospital and other clinical opportunities.

- Most of the medics are currently on their first deployment.
- Some medics may have provided care to no real world patients. The medic range of experience is 0-30 real world patients cared for prior to their first deployment and the majority of the patient encounters were DZ injuries.
- ***Prior to deployment, medics need to gain more experience by spending more time in the hospital and emergency room, more PFC training, and more ride-alongs with EMTs/paramedics – this was a common theme in the interviews.***
- SOF units have implemented medical training within their units that is beyond the level of training of conventional forces. For example, Army conventional forces have received TCCC for All Combatants and a designated group have received the Combat Life Saver (CLS) course. Rangers and Special Forces soldiers have added additional training to designate Advanced Ranger First Responders (ARFR) and Special Operations Forces Austere Care Course (SOFACC) with additional training to include sternal IO, needle decompression of the chest, cricothyroidotomy, Tranexamic Acid (TXA) administration, drawing fresh whole blood, and documentation, and they train as assistants to advanced SOF medics. However, SOF and Ranger medics report no clinical time on a regular basis—there is a trauma rotation once every 3 years for a month, or once every 2 years for 2 weeks. Special operations medics also attend the special operations combat medic skill sustainment course (SOCMSSC) for 3 weeks every 2 years which includes a combination of classroom and simulation training. However, some medics are getting a lot of experience with real world casualties, including host nation casualties, while deployed.
- Clinical skills exposure for medics is very limited at home station. Barriers to increased clinical practice include:
    1. Extensive warfighting and other competing training requirements
    2. Commander's priorities
    3. Providing sick call
    4. Numerous non-medical duties and administration
    5. Tasked to provide medical coverage for numerous training events
    6. Medics are not authorized to provide TCCC medications and interventions at home station
    7. Difficulty establishing MOAs with trauma centers and civilian EMS
    8. Hospital certification requirements
    9. Competition from other learners at the trauma centers
- Civilian hospitals have no equivalent skill set to many military medics beyond standard paramedic protocols. In some locations, it would be better for military medics to practice at military hospitals if they were allowed to practice their full skillset.
- ***MTFs need to provide better customer service to sponsor medic training and sustainment.***

## FLIGHT MEDICS

- A ***significant success*** noted was the transition of flight medics to Critical Care Flight Paramedics (CCFP). Nearly all flight medics currently deployed in CENTCOM are CCFP-certified and the overall impression was that they were very professional and well trained. The first active duty and reserve units to claim 100% CCFP-certified medics are currently deployed in CENTCOM. The C 2-3 Aviation Brigade, Hunter Army Air Field, Georgia, is also one of the first Army MEDEVAC units to establish civilian EMS ride-alongs for paramedics and their company commander has required 4 days per months of clinical duty at home station. This is a best-practice achieved with local command support.
- Several CCFPs mentioned a lack of skills checklists ("Table 8") for CCFPs. In addition, there is a lack of instructors at the Army medical simulation training centers (MSTCs) who are able to facilitate CCFP-level training.

## NURSES

No trauma training specific to nurses is specified in CENTCOM training requirements. Some nurses were able to obtain training in the Trauma Nursing Core Course (TNCC) through attending other courses, such as C-STARS or the Combat Casualty Care Course (C4). Such courses are listed as "highly recommended" in the CENTCOM training requirements fragmentation order, FY 16-17.

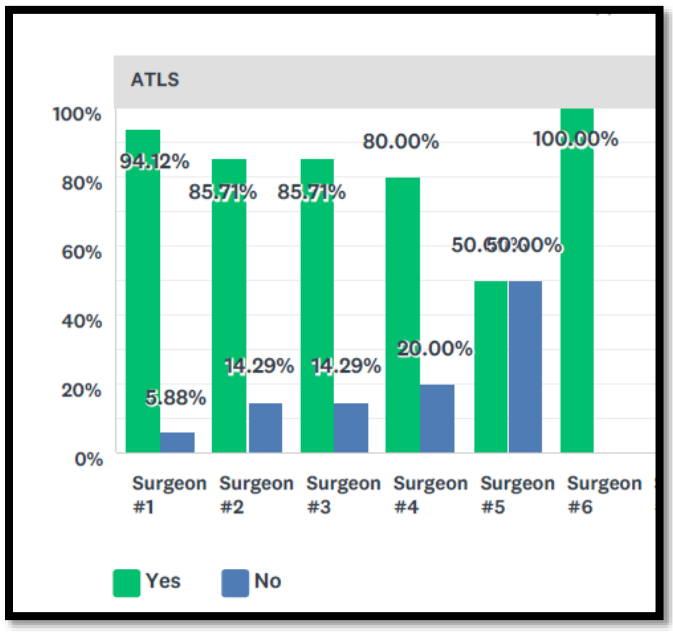
## SURGEONS AND SURGICAL TEAMS

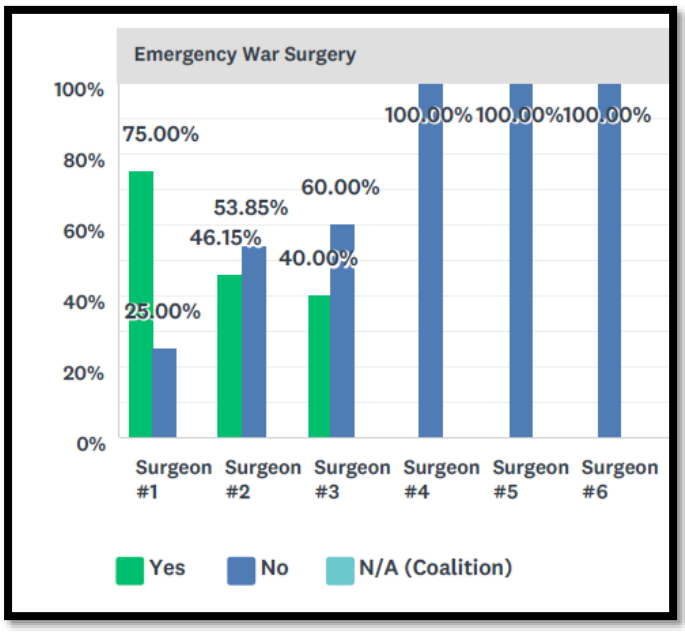
- Pre-deployment training has improved in comparison to previous trauma system assessments; however, the requirements remain inconsistent between Services and are inconsistently enforced and frequently waived. The biggest gaps occur when personnel are substituted shortly before deployment, which occurs frequently. Additionally, many surgeons still do not attend surgical training courses. Navy and Air Force personnel expressed concern that some basic requirements were not in the line remarks on their orders, including ATLS. A Navy Surgeon reported that the Emergency War Surgery (EWSC) course was not on his orders.
- The current trend of 90-day BOG program for Reserve Soldiers does not leave sufficient time to meet deployment training requirements. Many Army surgeons rotating in PROFIS positions do not attend pre-deployment training with their teams.
- Over 75% of teams attended some form of pre-deployment training. Comments to this question included the lack of surgeons and other physicians at these training courses.
- Reserve units perceive that they have less access to pre-deployment training courses and more difficulty obtaining information on available pre-deployment training courses compared to active duty. The 75$^{th}$ Combat Support Hospital (CSH; Army reserve) reported that approximately 30 members attended the ATTD FST course in Miami, Florida and the majority of the other members attended the JFCTMC. The CSH members who were sent to ATTD were not the surgical teams. The commander did not receive guidance on who should attend which course and as reservists they felt they did not receive timely information on

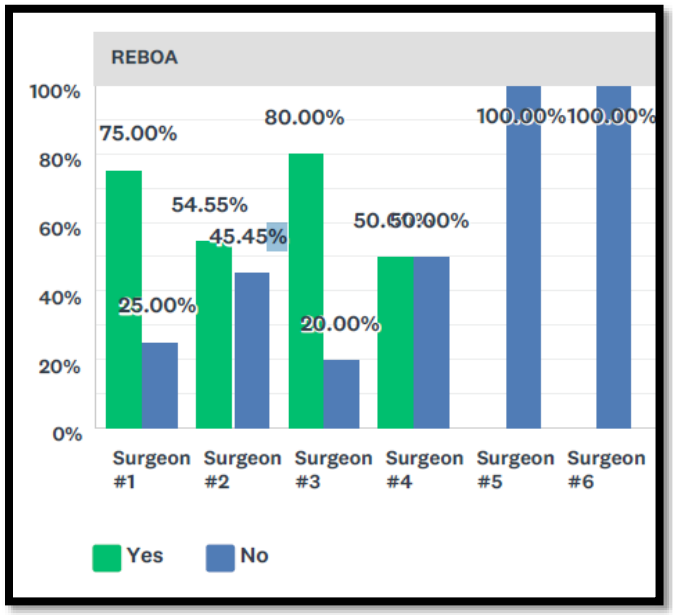
the training courses available. The team did not realize that the JFCTMC training was a requirement and they were notified about it by the unit they were replacing. As reservists they were told they did not have priority for the training course and were initially allotted only 5 slots in October (they actually attended the course with CSH members who were going to be their replacements). They were able to obtain many more slots in the November course. Surgeons should attend EWSC and do not need JFCTMC—the content of the lectures was repetitive for the two courses.

- During the interviews multiple physicians stated they did not attend any pre-deployment trauma training courses. The reasons cited included profile, short-notice tasking, and member deployed immediately after residency or fellowship.
- **Residency training may not include any military-specific or CPG training, therefore it is easily possible for some physicians to deploy without any orientation on CPGs and, in fact, some are not aware of the existence of CPGs.**
- Many physicians are not current in ATLS. Neither ATLS nor Center for Sustainment of Trauma and Readiness Skills (C-STARS) training is in line remarks for Air Force internal medicine and family medicine physicians at the Role 3. Fifty percent of Role 3 physicians are not current in ATLS. The providers felt that all Role 3 physicians caring for trauma patients should be current in ATLS, to include all physicians working in ICU and ICW.
- Trauma training courses involving short clinical rotations (NTTC, ATTD, C-STARS) have mixed reviews. The courses are relatively lengthy in terms of pre-deployment commitment (2-3 weeks), clinical experience obtained is variable and may not be applicable to the deployed environment. On the other hand, short, focused courses incorporating skills and simulation (EWSC, TCMC, JFCTMC) were seen as highly beneficial.
- Service members were universal in their praise of the JFCTMC and felt it was great preparation for deployment to a Role 3 facility, although the course is only required by the Army.

**Role 2 and Role 3 courses attended by surgeons prior to deployment. 17/23 sites responded to this question. Sites with more than 4 surgeons represent Role 3s and include specialty surgeons. Graphs shown are for ATLS, EWS and REBOA training courses.**



## MISSION READINESS

- Mission support by surgical teams is in high demand. Mobile surgical teams and split operations are becoming the standard at multiple locations. All services need to train and equip surgical teams at all levels of care for this mission. This is a major challenge not only for pre-deployment training courses, but also for surgical residency training programs—military-specific training tracks are needed.
- Most Role 2 units were not employed as originally conceived.
- One FST was divided into 3 GHOST teams, however their pre-deployment training was designed for a traditional FST.
    - Staff did not feel that training was sufficient for the GHOST mission.
    - Their training did not cover SOF vehicles or how to pack, move, set up to receive casualties, plan missions, or conduct damage control surgery within the constrained environment.
- Across the CENTCOM AOR, first responders expressed a concern if faced with situations requiring Prolonged Field Care (PFC) and requested more pre-deployment PFC training.
- Several surgical units and Role 1 units had not yet rehearsed a fresh whole blood (FWB) drive.
- The walking blood bank is a mission critical task for all Role 1-3 and should be trained prior to deployment as well as rehearsed during the right seat/left seat handoff.
- Several medics interviewed stated that EMT-B 68W is not enough for conventional forces and does not provide a career pathway.
- Select those medics with critical thinking ability and train them to be paramedics.

## SURGICAL SPECIALIST TRAINING: NEUROSURGERY, OPHTHALMOLOGY, HEAD AND NECK

- Neurosurgeons are currently required to attend EWSC, but they do not find any benefit to this course. It would be beneficial to have a neurosurgery-specific pre-deployment course that addressed lessons learned from recent conflicts.
- There is an ocular trauma course at the Uniformed Services University of the Health Sciences that is required every 3 years for ophthalmologists.
  The OFS ophthalmologist did attend the course within the last 3 years, but would have liked to have a refresher before deployment since there is only nominal opportunity to practice trauma at home station.
- A facial trauma course exists but is not required for head and neck surgeons.
- There is little opportunity for trauma call at home station, except for those surgeons stationed at military trauma centers.
- ***Surgical specialists are not current in ATLS—it is not required.***

## MEDICAL SKILL SUSTAINMENT DURING DEPLOYMENT

- Medical providers at all levels are concerned about keeping professional skills current while deployed. Many surgeons and professional staff were concerned that they perform very few procedures during deployment. One surgeon stated that he had only performed 2 surgeries in 6 months. Many professional staff were glad that they were not seeing U.S. casualties but expressed concern that they would not be clinically ready to treat major injuries after long periods of clinical inactivity.
- Currently there are few training opportunities in theater. Even if training is done before deployment, it is a perishable skill that needs to be maintained. In-theater skill sustainment training is needed when not clinically busy.
- Multiple examples of ground-level training programs were identified that were developed locally to meet gaps in pre-deployment training and skill sustainment while deployed.

1. REBOA training is available at the Role 3 MTFs in Arifjan, BDSC, and Bagram.
2. TCCC-based simulation training was developed in Q-West (including manikins procured from the MSTC in Kuwait) and pushed out to multiple sites throughout Iraq by a traveling training team.
3. Walking blood bank training and capability was implemented on a large scale at all Role 1 MTFs in Iraq and Syria.
4. CPG teaching is frequently done at the unit level for Role 2 and Role 3. Teaching slides are much needed and the slides on the JTS website are not up to date with the latest CPGs.
5. OIR had a weekly “Clinical Sync” educational conference, CPG review and relevant patient discussion for all MTFs in OIR. This weekly conference used DCS as a platform for the slides and Continuing Medical Education credit was available.
6. CCFPs conduct medical training classes for their team and other medics on base.
7. A Role 1 at Q-West did weekly simulation training for their medics.

## CHEMICAL BIOLOGICAL RADIOGICAL NUCLEAR (CBRN) TRAINING

Realistic CBRN simulation training does not exist and needs to be developed

# 11.0 TRAINING: SUMMARY

- Clinical skills exposure for medics is very limited at home station. Barriers to increased clinical practice are primarily related to multiple non-medical duties or providing "stand-by" medical support.
- Most flight medics in CENTCOM are now trained to the level of Critical Care Flight Paramedic.
- No trauma training specific to nurses is specified in the CENTCOM training requirements.
- Pre-deployment training for surgeons has improved in comparison to previous trauma system assessments; however, the requirements remain inconsistent between Services and are inconsistently enforced and frequently waived.
- Residency training may not include any military-specific or CPG training, therefore it is easily possible for some physicians to deploy without any orientation on CPGs and in fact some are not aware of the existence of CPGs.
- Many physicians are not current in ATLS.
- Mission support by surgical teams is in high demand. Better training is needed as well as means to mitigate skill degradation of highly perishable medical skills.
- Mission-specific training for neurosurgeons, ophthalmologists, and head and neck surgeons is needed.
- In-theater skill sustainment training is needed during times of low clinical operational tempo.

# 12.0 TRAINING: RECOMMENDATIONS

1. Establish requirements for trauma-relevant clinical practice for medics, nurses, and providers. (OPR CENTCOM SG)
    a. Fund methods to free up time for increased clinical practice (e.g., civilian contractors to support non-combat-related duties). (OPR SERVICE SGs)
    b. Centralize and facilitate training MOA process for civilian trauma center rotations and EMS training. (OPR SERVICE SGs)
2. JTS establish minimum medical training standards for deployed clinicians: (OPR JTS, SERVICE SGs)
    a. ATLS training for all physicians at Role 2 and Role 3 facilities.
    b. Trauma Nursing Core Course (TNCC) or Advanced Trauma Care for Nurses (ATCN) for registered nurses (RNs) caring for trauma patients.
    c. EWSC for all trauma and general surgeons.
    d. Specialty specific trauma course for surgical sub-specialists.

e. TCCC for Medical Providers for all providers, nurses, and medics.

3. Service components report compliance rates for CENTCOM-required pre-deployment medical and trauma training to CENTCOM SG quarterly. (OPR AFCENT, ARCENT, NAVCENT)

4. Service components continue to work to fully implement TCCC training IAW DoDI 1322.24, MRT, 16 Mar 2018.[5] (OPR SERVICE SGs)

   a. CENTCOM report compliance rates for TCCC training (medical and all-combatant) to JTS. (OPR CENTCOM SG)

5. Coordinate with Deputy Assistant Secretary of Defense for Health Readiness Policy and Oversight to develop metrics to track CPG working knowledge compliance IAW DoDI 1322.24, MRT.[5] (OPR CENTCOM SG, JTS)

6. Develop specific training courses, expand existing training courses, and incorporate lessons learned into future Role 2 readiness exercises to improve the ability to conduct mission support operations outside of established MEDEVAC range rings for surgical and non-surgical resuscitation teams. (OPR SERVICE SGs, OCR JTS)

7. Include JTS CPGs and performance improvement processes in medical Professional Military Education and Graduate Medical Education programs. (OPR DHA, SERVICE SGs)

8. Develop CPGs, standards, and program of instruction for Prolonged Field Care. (OPR DHA, JTS)

9. Review course enrollment restrictions for reserve units for key pre-deployment courses (TCCC, TCMC, BCT3, JFCTMC, EWSC) and ensure that reserve units that are deploying receive the same priority for training as active duty units. (OPR SERVICE SGs)

   a. Ensure that training courses meet the demand for training—identify key medical training courses and provide projected training needs annually. (OPR CENTCOM SG)

10. Review pre-deployment curricula for existing trauma training courses. (OPR DHA, JTS)

    a. Ensure walking blood bank CPGs and standards are established and pre-deployment training is conducted for all Role 1-3.

11. JTS update CPG teaching slides and post to website as soon as possible. (OPR JTS)

12. Services establish career pathways for medics to allow progression from EMT-basic to paramedic to registered nurse, physician assistant, or physician. (OPR Services)

13. MTFs provide better customer service to sponsor medic training and sustainment and facilitate MTFs as actual training platforms and allow medics to practice to their full scope of training. (OPR DHA and SERVICE SGs)

14. Improve and increase CBRN response simulation training. (OPR DHA)

15. Deploying physicians, physician assistants, nurses, medics, corpsmen and pararescuemen should be trained in the JTS-approved TCCC for Medical Personnel course prior to deployment IAW with current the USCENTCOM directive. (OPR SERVICE SGs)

16. CoTCCC review TCCC curriculum for airway management for medical providers and provide feedback to primary training sites. (OPR JTS)

# 13.0 MATERIEL

## INFORMATION SYSTEMS

- There are multiple issues with medical information systems that must be addressed.
- A myriad of temporary solutions to deployed electronic health records (EHRs) has left a system of cobbled-together patches that lack interoperability and reliability.
- Personnel are required to duplicate input into multiple systems, or create various local solutions for backup due to overall unreliability of the EHR.
- ***Processes that should be easily amenable to automated solutions, still require information to be gathered and submitted to various organizations.***
  - Currently there is no method to identify trauma patients in TMDS or other EHR.
  - Medical units are required to submit a trauma log to the JTS so they can pull the record for inclusion into the DoDTR.
  - This manual process requires constant education and compliance from forward-deployed units.
  - There needs to be a mechanism for the JTS to electronically identify trauma records; therefore, the requirement to submit a trauma log would become obsolete.
- The DoDTR recognizes locations, but not units. Multiple units may inhabit one location; additionally, the capability of a location/unit may change depending on the operational requirements. Mechanisms should be implemented that:
  - Identify units, team members and team capability in order to perform appropriate performance improvement and help determine the personnel mission set needed for the AOR.
  - There should be an identifier in the DoDTR that indicates Role of Care, team size and personnel support. These will all be dynamic data points and currently there is no IT mechanism to identify this in the DoDTR.
- It is difficult and time-consuming for medical providers to gain access to deployed health systems, specifically those required to review and document patient care.
  - Multiple computer medical record programs exist, each require separate applications in order to obtain an account (i.e. AHLTA-T, CHCS, MEDPROS, JLV, PSR, TRAC2ES, TMDS, HAIMS, AVHE, HELP-telemed).
  - It is challenging for providers rotating into theater to even understand or be aware of which accounts are needed to support their mission since it is not the same as home station and is set up differently at different locations within CENTCOM.
  - Medical providers requested that computer access should be a package deal—separate account applications should not be necessary for each program.

  - Patient information exists in too many locations. Not only is it difficult, redundant and cumbersome to create a patient chart in all these different electronic domains – providers along the continuum of care may not be able to access all of the records, and it makes it more challenging to do a thorough PI review on a chart given the multiple electronic domains for patient record documentation.

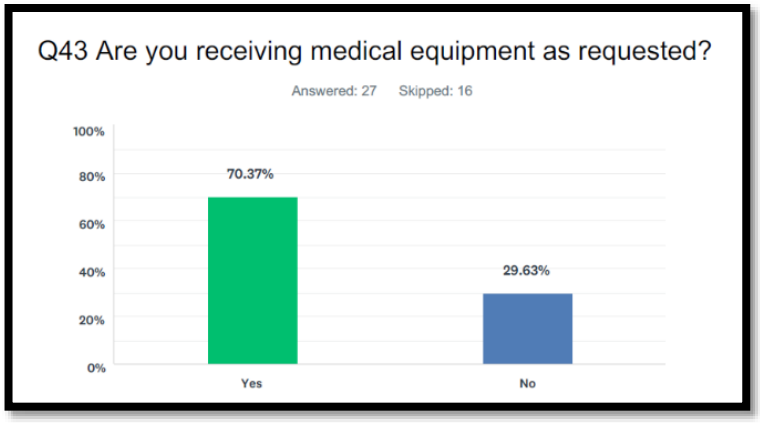
- Deployed computer systems are not reliable.
- The Medical Communications for Combat Casualty Care (MC4) program is the current deployed IT interface. It launches Theater Medical Information Program (TMIP) Composite Health Care System (CHCS) Caché (TC2), Armed Forces Health Longitudinal Technology Application – Theater (ALTHA-T) and TRANSCOM Regulating and Command & Control Evaluation System (TRAC2ES). There are frequent computer glitches and data loss resulting in poor documentation and therefore suboptimal care. MC4 personnel deployed should have more accountability for the systems problems. There was no sense at some of the Role 3s that these personnel were at all helpful.
- The Joint Operational Medicine Information Systems (JOMIS) Program is supposed to modernize, deploy, and sustain the Department of Defense's (DoD's) operational medicine information systems by fielding the DoD Modernized Electronic Health Record (EHR) solution while developing and fielding new theater capabilities to enable comprehensive health services to deployed forces across the range of military operations. The JOMIS Program is under the executive management and oversight of the Office of the Under Secretary of Defense for Acquisition, Technology and Logistics (OUSD (AT and L)) and the Program Executive Office (PEO) Defense Healthcare Management Systems (DHMS).
- There is no corporate solution for allowing MC4 onto military networks.
- Whenever a new medical treatment site is established, the local network owner has to grant permission for JOMIS to operate. This leads to major gaps in medical communication:
  - Role 2 units on SOF compounds (Dahlke, Pamir confirmed) do not have any MC4 network capability because they are not on the ".mil" domain. Medical care for service members seen at these locations is documented on a Standard Form (SF) 600, one copy is given to the service member and another copy is stored and uploaded into TMDS upon redeployment. The process established by CENTCOM is for all locations to have TMDS access and directly upload scanned handwritten documents or coordinate with the nearest Role 3 for assistance getting the records uploaded.
  - JOMIS has plenty of personnel support in CENTCOM with MC4 employees at all Role 3 and many Role 2 facilities; however, the system is still cumbersome, unreliable, difficult to use, and requires repeat documentation.
- Coalition partners utilize U.S. blood supply and care for U.S. casualties, however they are denied access to TMDS which is designated NO-foreign. This does not allow the coalition partners the ability to perform standard documentation when it comes to blood products.
- Canadian Role 2 at Erbil cannot use MC4 or TMDS because these are listed as a NO-foreign systems. Instead, they upload scanned medical records for U.S. service members into the Canadian electronic health record.
- When the Role 3 at BDSC was established, it took over 6 months to get MEDWEB to function at the facility. As a result, the BDSC radiologist could not view films from other sites.

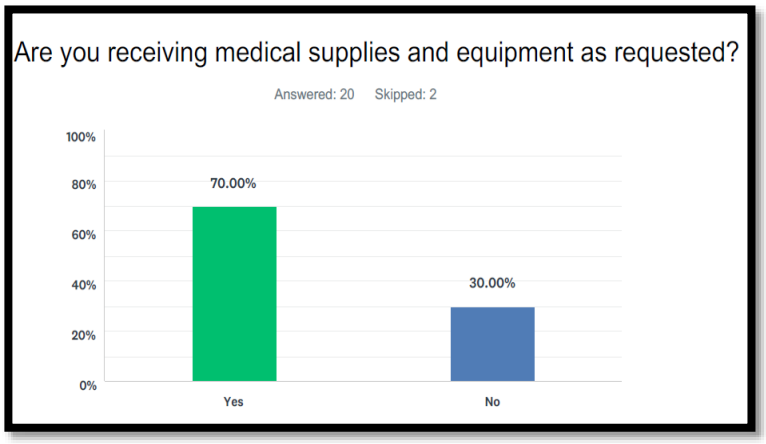
- MC4 communication between KAF and BAF is reported as an issue, the radiologist at KAF says he cannot produce a signed radiology report for studies obtained at BAF.
- The Role 2 at Jalalabad Airfield (JAF) is not "allowed" to have a scanner. The S6 has blocked scanner use on the base due to cross-domain violations. They need to go through the S6 office, fill out a scan request, long process. However, the adjacent FST has obtained a waiver for scanner use.

## MEDICAL EQUIPMENT

- Medical equipment in theater is a mix of Theater Provided Equipment (TPE) and organic unit equipment. The process of maintaining and replacing TPE is not well-defined and varies from site to site. Unlike the Table of Distributions and Allowances (TDA) at continental U.S. (CONUS) based-medical facilities, there is no system that monitors the maintenance and determines life-cycle replacement of TPE.
- Teams have proposed that all units bring their own organic equipment with them from the U.S. since that equipment typically undergoes regular scheduled maintenance and life-cycle replacement.
- This solution is not without its own drawbacks:
    1. Getting the units' equipment into theater.
    2. The majority of medical equipment uses Lithium ion batteries which have significant restrictions with air transport.
    3. Different units may use different equipment, which impedes interoperability. For example, some MEDEVAC units use ZOLL monitors and the entire system must be switched out if another team is using the Propaq.
    4. There is a potential for long delays in getting medical equipment into theater, and even further delays in receiving the Lithium batteries to run the equipment.
    5. Incoming units may not be authorized to bring their equipment into theater because TPE is available in theater, even when the TPE is known to be inadequate.
- 30% of Role 2s and Role 3s report they are not receiving adequate supplies. Comments to this question included: "orders have to be consistently repeated"; "U.S. Army Medical Materiel Center in Southwest Asia (USAMMC-SWA) is slow, there is a long lag, logistical tail is a fail"; "Defense Medical Logistics Standard Support (DMLSS) Customer Assistance Module (DCAM) accounts can take months to establish".

- 30% of prehospital and Role 1 units are not receiving timely medical supplies. Comments to this question included: "still waiting for Department of Defense Activity Address Code (DoDAAC). It is difficult to receive supplies"; "more than 4 weeks since order placed" (2 comments); "movement of containers is extremely slow…we have been waiting for a month." An additional barrier to using organic medical equipment for each unit is that not all units have assigned equipment. The Navy Role 2 at Q-West was pieced together for their mission and did not have their own equipment set.




- FSTs assigned to support the GHOST team mission are equipped with the standard Army FST MES. The standard equipment is not appropriate for the mobile mission because it is too large to be easily transported and does not fit not onto various transport vehicles. They also stated the power supply (generators) need to be specific for the mission—multiple small portable generators would allow greater flexibility to meet mission demands. Teams are not only providing mission support without the appropriate training, but also without the appropriate equipment and sets. There is a need for an interoperable, standardized set for these small, mobile surgical teams.
- Many units do not have the most current allowance. No MEDEVAC unit interviewed had the current approved Army MEDEVAC medical equipment set (MES).
- One MEDEVAC unit reported they had been in theater 2 months and had not received the equipment they shipped 6 weeks prior to deploying. They had to sign for equipment from the unit they replaced to be able to perform their mission.
- Replacing outdated and maintaining Patient Transport Equipment (PTE) is also a slow process and does not happen in theater.
- Units report multiple equipment issues they cannot seem to get resolved in theater.
- The MEDEVAC MES does not include blood product storage containers and obtaining the containers in theater is difficult and delayed.
    - Blood product storage capability, to include Golden hour containers and Hemacools, is mission-critical for MEDEVAC since prehospital transfusion has been shown to improve survival from hemorrhagic shock.

  - Additionally, if the unit deploys to a new theater, it would be impossible to obtain blood storage containers in a timely manner.

- Standardizing patient monitors: issues arise when patients are connected to a Propaq or ZOLL monitor and then have to be transferred to another platform or unit that has a different piece of equipment. It was notes at Al Asad that they thought a ZOLL was malfunctioning when it worked correctly, it just required a different electrode than what was stocked by the Propaq equipment.
- SOF medics are also trained to transfuse whole blood—several teams reported similar challenges with obtaining the mission-appropriate blood storage containers after arrival in theater when they did not deploy with containers.
- The process of accounting for equipment within theater is archaic. Within the current system, unit organic equipment must be accountable by serial number to the specific unit, while TPE can be exchanged within the patient movement system. Accountability for a specific device is unnecessary and limits the ability to maintain equipment and maintain patients on equipment.
- The capability exists within the AE system to account for equipment through multiple exchanges by scanning and tracking. If this system were implemented within theater, patients could move throughout the system without requiring multiple equipment exchanges, reducing risk to the patient and facilitating patient transfers. Additionally, equipment could be exchanged when maintenance is required.
- Medical maintenance is located at Role 3s and some Role 2s. The biomedical equipment technician (BMET) teams are very proactive in addressing routine maintenance within their areas of responsibility, but if equipment needs to be sent out of theater for repair, there is generally no replacement available. Teams are very reluctant to send their unit's assigned equipment for routine maintenance for fear that the same item will not be returned.
- 16-slice CT scanners are still in use in several Role 3 locations and are adequate to meet the needs at low volume locations; however, they are below the current standard for care. Older CT scanners should be replaced with a minimum of a 64-slice scanner.
- The Impact 754 ventilator is still the primary ventilator in use by Army MEDEVAC and Role 2, despite ongoing complaints about the unreliability of the aging ventilators. Air Force units have upgraded to the Impact/Zoll 731 ventilator.
- Medical interiors for MEDEVAC aircraft are removed after arrival in theater and are currently considered a waste of money. All Army MEDEVAC units are operating with "slick" interior. Some flight medics stated that storage cabinets for medical supplies would be useful as most if not all are currently using hanging dropdown bags.
- The Role 3 facility at KAF has a neurosurgeon who has not been able to operate on 3 out of 6 neurosurgical cases because they required spinal decompression and the equipment was not available (there are other clinical factors that need to be considered – however, the team should have the necessary supplies). The equipment is on order but has not been received at this time. Ordering of durable medical equipment is complicated by determining who is responsible for funding the equipment.
- While it has been proposed that an MRI be added to the AOR in order to keep certain patients in theater (knee, shoulder, other musculoskeletal injuries) – data on these types of cases needs to be analyzed.

Many patients with musculoskeletal injuries do not get put into the DODTR. In order to determine if MRI capability would be an appropriate endeavor (from a fiscal and manpower perspective), there would have to be an analysis on the number of patients evacuated for benign musculoskeletal complaints who actually returned to theater.

## SPLIT OPERATIONS COMPLICATING LOGISTICAL SUPPORT

Multiple units reported difficulty managing logistics when their team is split at different locations. A MEDEVAC unit from South Dakota National Guard was split into 6 locations but deployed with only two DODAACs required for ordering supplies. The lack of derivative DODAACs led to major issues ordering Class VIII (medical supplies). The unit was using expired medications and was unable to successfully order resupply because the DODAAC associated with them was at another location with another part of the company.

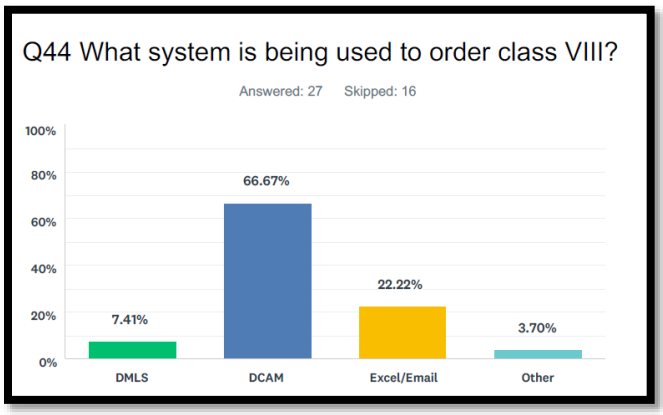
## COMMUNICATION

- Surgical teams and MEDEVAC units in many locations do not have a method to directly communicate with each other when transporting patients. In many locations, the current process involves the aircraft commander contacting the MEDEVAC operations center by radio, where the watch officer receives and types the message into a secure chat system to be relayed to the surgical facility's operations center and eventually to one of the receiving physicians. This process may require several non-medical personnel to pass on a message regarding the medical status of the patient. This is contrary to how medical control is provided in CONUS civilian facilities where ambulance personnel have direct radio communication with medical control and receiving hospitals.
- Communications pertaining to patient movement needs to be simplified. Systems utilized include Microsoft Internet Relay Chat (mIRC), Transverse, and J-chat. The number of systems and the communication through many non-medical personnel impedes accurate and timely communication. **According to one SOF physician, "If you're trying to create battlefield confusion, it works very well."**
- "WhatsApp" is more reliable than any other communications system in theater. At the Role 3 in OIR, WhatsApp was the primary form of communication between the Role 2 surgeons and the Role 3 TMD. At BDSC (Role 3 OIR), WhatsApp was used for all MASCAL and patient arrival information because the paging system and local (Roshan) cell phones were not reliable.

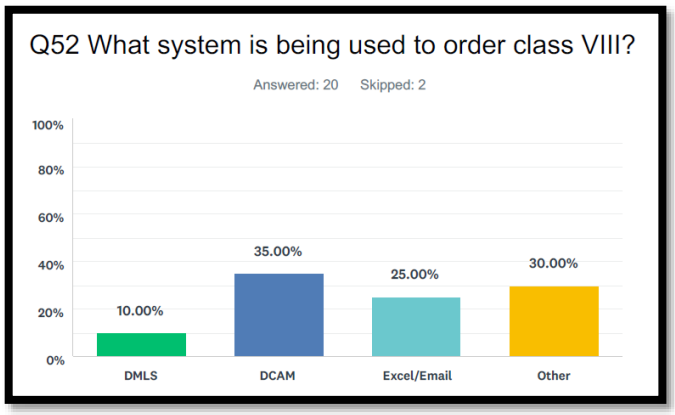
## CLASS VIII (MEDICAL SUPPLIES)

- Multiple concerns were expressed about ordering and receiving Class VIII medical supplies. A few of the issues may be related to knowledge gaps about the logistics process in CENTCOM.
- The Navy Role 2 at Q-West said that they used the Theater Enterprise-Wide Logistics System (TEWLS) for ordering supplies instead of the Defense Medical Logistics Standard Support (DMLSS) Customer Assistance Module (DCAM) utilized at most other locations, and they also reported going through the Navy Expeditionary Medical Support Command (NEMSCOM) for CL VIII instead of the theater logistic system.

**Role 1 and Prehospital supply systems.**




**Role 2 and Role 3 supply systems.**

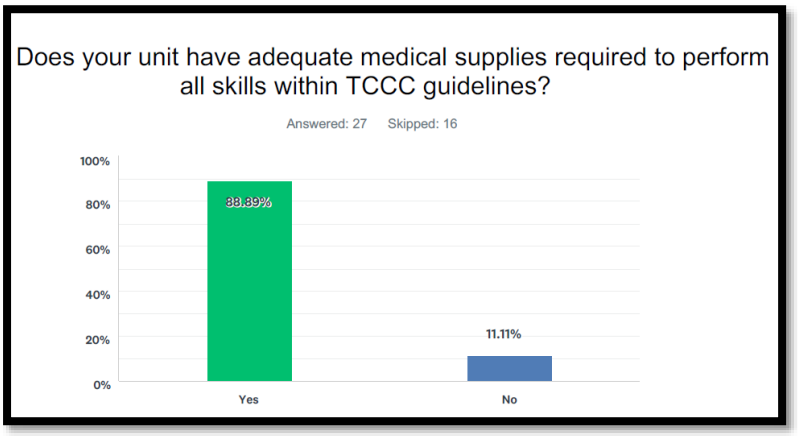


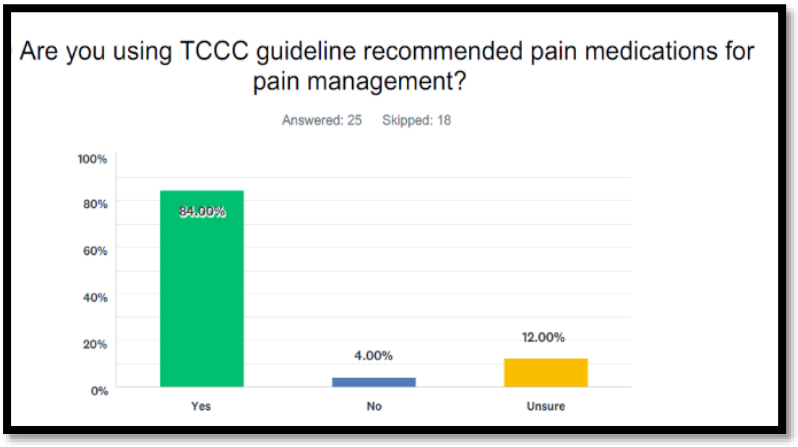

- Each unit's Class VIII orders are canceled when they redeploy (DODAAC account is closed when they redeploy). Often the new unit does not realize that the order was canceled. This has resulted in items being on order for more than 1 year, such as Golden Hour containers and Hemacools for MEDEVAC units.
- Several units expressed concern that substitutions for out-of-stock Class VIII items are not always acceptable and may be substituted without approval.
- Some units have implemented exception to policy letters to allow them to use expired medications because they have not received resupply.

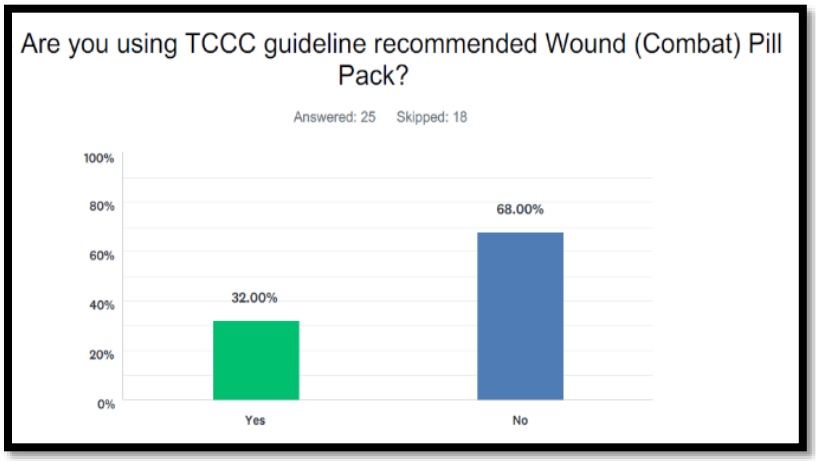
## TCCC MATERIELS

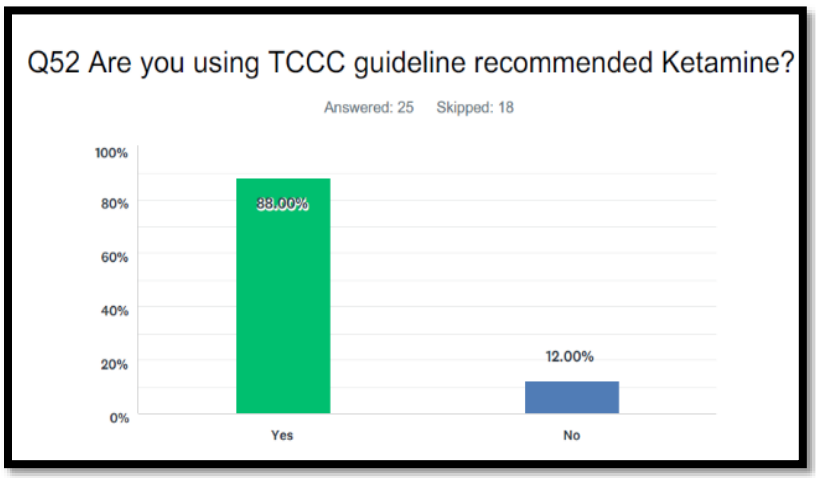
- Junctional tourniquets are available in many locations, however there are still locations that do not have junctional tourniquets available. Many medics are using (or planning to use) improvised junctional tourniquets. Although the evidence for the lifesaving benefit of junctional tourniquets is not as strong as that for limb tourniquets, junctional tourniquets are a tool for external hemorrhage control that medics should have access to, especially in combat theaters where the use of dismounted IEDs is widespread.
- 78% of all prehospital and Role 1 units reported having junctional tourniquets (27 survey responses)
  - 80% of them have the SAM® Junctional Tourniquet (SJT); 45% have the Junctional Emergency Treatment Tool (JETT™); 10% have the Combat Ready Clamp (CRoC®) and 28% report carrying improvised junctional tourniquets.
  - Comments from prehospital/Role 1 units in response to which junctional tourniquet they use:
    - "AAJT is available"
    - "Most medics tend to lean more on improvised due to taking up space in POI bags"
    - "We use REBOA"
- 75% of all Role 2 and Role 3 units had junctional tourniquets (20 survey responses)
- 73% of them have SJT; 40% have JETTs; 13% have CRoC.

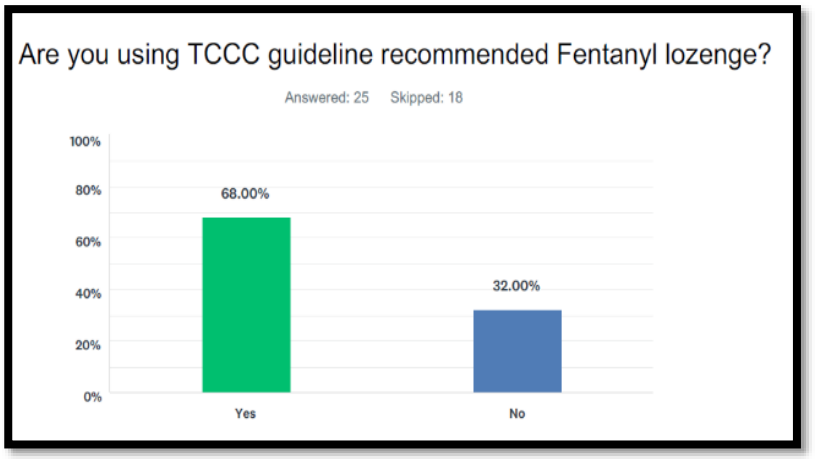
- 89% of prehospital/Role 1 units report having adequate medical supplies required to perform TCCC. (27/43 responses for this question)
- Several medics report they are unable to order oral transmucosal fentanyl citrate (OTFC; fentanyl lozenges) through the MEDLOG system.
- Many Army units are carrying the Army Individual First Aid Kit (IFAK) II. Some units have substituted the non-TCCC-endorsed Tactical Mechanical Tourniquet (TMT™) for the Combat Application Tourniquet (C-A-T®).
- The Army IFAK II does contain TCCC-recommended items such as eye shield and vented chest seal. The container has an inner portion that slides out, presumably for easier access, however medics report it is prone to bursting apart.
- During direct interviews, no units reported carrying the Combat Wound Medication Pack; however the online survey reached more units in theater and eight units reported the use of the Combat Wound Medication Pack.
- Survey comments regarding ketamine:
  - Also using dilaudid, tramadol, and versed to complement analgesia
  - Ketamine on hand, no indications for use as of yet.
  - Role 1 with no trauma capability




Are you using TCCC guideline recommended Wound (Combat) Pill Pack?
Answered: 25 Skipped: 18
100%
80%
60%
40%
20%
0%
32.00%
68.00%
Yes
No


Q52 Are you using TCCC guideline recommended Ketamine?
Answered: 25 Skipped: 18
100%
80%
60%
40%
20%
0%
88.00%
12.00%
Yes
No


Are you using TCCC guideline recommended Fentanyl lozenge?
Answered: 25 Skipped: 18
100%
80%
60%
40%
20%
0%
68.00%
32.00%
Yes
No

## BLOOD PRODUCTS

- All MEDEVAC units in OIR are carrying Lo-titer O whole blood (LTOWB).
- Role 2 MTFs in OIR have also received LTOWB.
- The Role 3 in OIR was the only surgical unit without LTOWB.
- MEDEVAC units in OFS were carrying red blood cells.
- Cold platelets are FDA approved for 3 days of storage; in CENTCOM, cold platelets are approved for 10 days currently and efforts are ongoing to extend the storage time.
- Pre-screening for WBB in theater is challenging:
  - Delays occur secondary to getting the samples to Landstuhl Regional Medical Center (LRMC) for analysis.
  - The supplies (correct blood tubes) may not be readily available.
  - Anti-A and B titers to identify LTOWB donors cannot currently be obtained in theater; however, the Role 3 in OIR was undergoing lab verification in order to perform low-titer testing.
- Many of the users of LTOWB are not documenting medical care provided, or are not successfully forwarding the documentation to JTS. Clinical data and tracking outcomes of LTOWB use is a priority, the challenge is enforcing this priority with the small forward units that are the largest users of LTOWB.
- Ranger medics receive LTOWB every mission.
- Some SOF medics in OFS are carrying blood component therapy, red blood cells (RBCs) and plasma and do not have a protocol or specific training for how to transfuse the components.
- The medics stated their plan was to infuse the RBCs with 500 cc saline and then follow that with plasma.
- In OIR the decision regarding the distribution of limited blood products is made under the guidance of the TMD in communication with the CENTCOM Blood Program Director. Every Role 2 and MEDEVAC team in OIR had LTOWB; the Role 3 did not have LTOWB.
- There are differences in prioritization within OIR and OFS in regard to blood product distribution and also in medics carrying component therapy without a standard operating procedure (SOP). Current research supports use of whole blood as soon as possible after injury. Additionally, minimally manned surgical teams need to reduce task saturation and greatly benefit from whole blood use to simplify the process. However, BSD personnel have decided to distribute a portion of the LTOWB to Role 2s to reduce product wastage.
- Austere surgical teams are supplied with plasma but do not have plasma thawers that are suitable for field use. Many "creative" plasma thawing methods are utilized, most typically some type of crock pot or metal basin and warm water, monitoring water temp with a thermometer to maintain the temperature at 36-40°C.
- GHOST teams in Afghanistan may not have access to any platelet source. They do not have the capability to collect FWB while on missions and do not always carry any whole blood or platelets with them.
- Whole blood shipped from the U.S. is often only good for 3-11 days after arrival to the user.
- Transition to CPD-A blood storage solution will increase the storage time from 21 days to 35 days.

- A Whole Blood Working Group was stood up in OIR in November 2017 to communicate with line leadership and ASBP about the importance of LTOWB in theater.
- It was suggested to forward position blood donor locations at theater gateways, such as to Kuwait and Qatar. A memorandum for record was sent from the TF MED Command through CJTF to the OIR Line Command. This is currently being worked on with the ASBP, but since the testing is not FDA approved outside the U.S. it is currently not possible.

# 14.0 SUMMARY: MATERIEL

- There are multiple issues with medical information systems that must be addressed.
  a. A myriad of temporary solutions to deployed electronic health records (EHR) has left a system of cobbled-together patches that lack interoperability and reliability.
  b. Personnel are required to duplicate input into multiple systems, or create various local solutions for backup due to overall unreliability of the EHR.
  c. It is difficult and time-consuming for medical providers to gain access to deployed health systems, specifically those required to review and document patient care.
  d. Deployed computer systems are not reliable.
- Processes that should be easily amenable to automated solutions, still require information to be gathered and submitted to various organizations.
- Medical equipment in theater is a mix of Theater Provided Equipment (TPE) and organic unit equipment. The process of maintaining and replacing TPE is not well-defined and varies from site to site. There is no system that monitors the maintenance and determines life-cycle replacement of TPE.
- The process of accounting for equipment within theater is archaic. Within the current system, unit organic equipment must be accountable by serial number to the specific unit, while TPE can be exchanged within the patient movement system. Accountability for a specific device is unnecessary and limits the ability to maintain equipment and maintain patients on equipment.
- The procedure of closing each unit's Class VIII DODAAC account and orders when they redeploy has resulted in items being on order for more than a year.
- Availability of TCCC-recommended supplies is approximately 80-90% in prehospital/Role 1 units.
- LTOWB is in high demand due to ease of use and perceived benefits.
- Many users of LTOWB are not documenting medical care provided, nor are they successfully forwarding documentation to JTS. Tracking outcomes of LTOWB use is a priority.

# 15.0 RECOMMENDATIONS: MATERIEL

1. Commission a computer systems working group to solicit and develop interoperable, enduring solutions on interconnectivity and address common issues across CENTCOM. (OPR CENTCOM CDR)
2. Replace outdated deployed EHRs with a functional and reliable system. (OPR DHA J35/TFWF, OCR AT&L/JOMIS)
3. Develop a simple and reliable system for scanning hand-written medical records, such as a secure phone application, to photograph and send images. (OPR DHA J35/TFWF, OCR AT&L/JOMIS)
4. Include photo documentation relevant to patient care in the improved deployed EHR. (OPR DHA, OCR JOMIS)
5. Determine method of getting the "Five Eye" Coalition Nations (US, UK, Australia, Canada, NZ) permission to use MC4 and other computer systems required to document and track care. (OPR CCSG)
6. Develop CENTCOM information sheet for medical personnel describing how get accounts and to access past medical histories using TMDS or AVHE and streamline the account application process across theater. (OPR CENTCOM SG)
7. Update the JTS Use of Electronic Documentation CENTCOM AOR CPG. (OPR JTS)
8. Mandate medical units (with exemptions as deemed necessary) to bring medical equipment into theater, except for Role 3 facilities and medical information systems which are better managed in theater. (OPR CENTCOM SG)
9. Give coalition partners access to TMDS when using U.S. blood supply and supporting U.S. casualties. (OPR CENTCOM SG)
10. Add blood storage containers (Golden hour containers and Hemacools or similar) to MEDEVAC MES and expedite implementation of the new MEDEVAC MES. (OPR Medical Evacuation Proponents Division [MEPD]).
11. Add FM communication to Role 2 and Role 3 capabilities and establish a process to deliver updated MIST reports en route. (M-Mechanism of injury, I—Injury, S—Signs and Symptoms, T—Treatment). (OPR CENTCOM SG)
12. Implement system already in use by AE to scan and track all equipment required for patient movement within theater and eliminate individual device accountability to a specific unit. (OPR CENTCOM SG)
13. Develop a solution to have one systems account request form for all medical applications in theater. (CENTCOM SG)
14. Develop a central store of replacement patient resuscitation equipment and a responsive system to deliver replacement equipment when and where it is needed. (OPR CENTCOM SG)
15. Establish a logistics process to review and selectively transfer outstanding logistics orders from a unit that is redeploying to their replacement unit. (OPR CENTCOM SG)

16. Ensure that new CT scanners purchased are at least 64-slice scanners. (OPR CENTCOM SG)
17. Pre-screen all deploying military (and ideally all civilians) for WBB, to include identification of LTOWB donors, prior to deployment and record results in TMDS. (OPR SERVICES)
18. Increase availability of LTOWB through the Armed Services Blood Program. (OPR ASBP)
    a. Expedite transition to CPD-A storage solution.
    b. Forward position whole blood donor centers in Qatar and Kuwait.
19. Prioritize prehospital medics and austere surgical teams to receive available LTOWB. (OPR CENTCOM SG)
20. Ensure trauma clinician input into distribution of limited blood resources. (OPR CENTCOM SG)
21. Improve data collection, documentation, and tracking of LTOWB use throughout CENTCOM. (OPR CENTCOM SG)
22. Eliminate the medical interior for MEDEVAC aircraft. (OPR MEPD)
23. Review availability of fentanyl lozenges, ketamine, and all other medications recommended in TCCC guidelines. (OPR CENTCOM SG)
24. CoTCCC undertake a comprehensive review of currently available limb tourniquets and consider updating TCCC tourniquet recommendations as indicated by the available evidence. (OPR JTS)

# 16.0 LEADERSHIP AND EDUCATION

A noticeable theme was that there was a lack of leadership understanding of CENTCOM Regulations and Policies. This demonstrates a gap in effective implementation of CENTCOM Policy.

## ARMY FST AND ROLE 2 LEADERSHIP

- Army FSTs mostly rely on the PROFIS system to fill many provider (mostly physicians to include surgeons) positions; these providers rotate every 90-140 days and usually do not have leadership roles on the team. Some FSTs have very junior leaders who do not have deployment experience and are leading surgeons who outrank them significantly in time and experience. This is especially true in Reserve Role 2s where surgeons may be Colonels (O6) who have deployed 4-5 times and their Commander and Executive Officer are on the first deployment as Captain (O3) and First Lieutenant (O2). This situation was observed in nearly all FSTs.
- Unit-level leaders have a lot of autonomy in the deployed environment.
- Some FSTs have additional leadership challenges. As an example, the 555 FST, 7-25 Brigade Support Battalion Role 2, and 501st Infantry Battalion Role 1 are co-located in the same facility. The Role 1 commander is a First Lieutenant and the FST officer-in-charge is a nurse anesthetist Major. There was confusion about who was in charge of the facility and the final outcome was that the First Lieutenant was

in command. This is the busiest Role 2 in Afghanistan, having cared for 70 traumas in 4 months (one 9 patient MASCAL) and 100 clinic patients per week.

- A second example was the 1st FST assigned to SOJTF-A to provide SOF mission support "GHOST" team mission. The commander was a First Lieutenant who requested not to be in command, and several rotating providers were Colonels. The Lieutenant requested to place rotating providers in charge, creating confusion and a lack of responsibility.
- There is a lack of surgeon/traumatologist leadership in many of the Role 2s. An exception to this was the Navy Reserve EMU in Q-West. The unit commander was a Navy Captain anesthesiologist while the rest of the physician team was composed of surgeons on their first or second deployment. With strong leadership, the team functioned very well and appeared experienced and prepared.

## MEDICAL PERFORMANCE IMPROVEMENT

- There is no standardized PI at the unit level in theater. The only formalized PI occurs on the Thursday JTS call. The TMDs in each theater do unit level PI – however, with the exception of KAF, there are no PI nurses or support for PI outside the TMD position.
- Unit-level PI is conducted in the form of morbidity and mortality conferences at some MTFs, primarily Role 3 facilities.
- BDSC Role 3 TMD leads a weekly theater-wide education and PI conference which focuses on case discussions and educational topics within OIR.
- KAF Role 3 has a designated PI nurse, however no specific PI training was provided prior to deployment.
- CJTH Role 3 and OIR Role 3 do not have a designated PI nurse.
- For Role 2 and prehospital care, AARs are generally conducted after cases/missions and may include medical-specific reviews.
- AE and Critical Care Air Transport Teams (CCATT) maintain a robust, worldwide PI database.
- There is an Air Force patient safety program which oversees deployed Air Force locations and addresses patient safety in theater, mirroring stateside processes.
- The majority of patient safety reports are related to medication errors and near misses.
- CENTCOM-wide PI is led by JTS and consists mainly of the weekly Combat Casualty Care Conference and the bi-weekly PI conference for discussion.
- The monthly JTS director's report tracking PI trends has not been published since the end of OEF, although a new director's report has been drafted.
- The Role 3-specific trauma registry reports have only sporadically been published since the end of OEF.
- There is no prehospital PI report which tracks trends, and although several organizations collect AARs related to medical care, there is no collation of data and many AARs are merely collected and stored as separate documents within the organization.
- The Role 2 database is too time-consuming and redundant.

- The Role 3s lack a trauma nurse coordinator (TNC).

# 17.0 SUMMARY: LEADERSHIP AND EDUCATION

- Due to the PROFIS system, Army FSTs have very junior leaders with no deployment experience leading surgeons who outrank them significantly in time and experience.
- There is no easily accessible, organized AAR repository in CENTCOM.
- There is no standardized PI at the unit level in theater.
- The CENTCOM Trauma System is lacking a TNC at the Role 3s.
- There is no pre-deployment training in PI.

# 18.0 RECOMMENDATIONS: LEADERSHIP AND EDUCATION

1. AMEDD provide update to CENTCOM SG on future management of PROFIS system, FST, and the future Forward Resuscitative Surgical Team (FRST) leadership. (OPR Army SG)
2. Create and/or improve awareness of CENTCOM AAR repository. (OPR CENTCOM SG)
    a. Create a standard medical unit AAR template and require submission of unit-level AARs to CENTCOM SG for all medical units and use AARs to grow organizational performance improvement and leader self-learning.
    b. Improve access to and knowledge of existing CENCOM AARs for deploying leadership.
3. Work with operational medical units to determine a communication strategy for medical leaders that outlines CCR requirements and highlights important information required for continuity (e.g. medical transition check list). (OPR CENTCOM SG)
4. JTS develop a pre-deployment Trauma System and Performance Improvement training course for Role 3. (OPR JTS, DHA)

    CENTCOM require at least one TNC and Role 3 trauma medical directors to attend JTS PI course. (OPR CENTCOM SG)
5. Develop a DoDTR-based PI report for CENTCOM and publish monthly, to include prehospital care and surgical capabilities. (OPR JTS)
6. Develop a path for leadership for trauma professionals that encourages them to command Role 2 and Role 3 MTFs. (OPR SERVICES)

# 19.0 PERSONNEL

## THEATER TRAUMA SYSTEM STAFFING

- The current CENTCOM trauma system evolved from the forward deployed Joint Theater Trauma System that was in place 2005-2014. Since the end of OEF, the roles of Trauma System Director and Trauma Nurse Coordinator have been loosely defined and poorly supported, with variable command support at the Role 3 level. After the publication of DoDI 6040.47,[1] setting a worldwide requirement for a trauma system within each COCOM, the decision was made by the CENTCOM surgeon's office to designate the Role 3 senior trauma surgeon as the trauma system director within their area of operations. Unlike the prior JTTS director who reported directly to the CENTCOM surgeon, the Role 3 trauma surgeon reports to the Role 3 commander which limits their ability to influence medical assets in other task forces outside of TF MED. Additionally, the Role 3 trauma surgeon may have little training in trauma systems, and trauma system functions that holistically approach performance improvement through data collection and analysis and registry practices that support and optimize prehospital care, en route care, and hospital care. Currently, no nurse has been assigned as a Trauma Nurse Coordinator in order to conduct PI in OIR or OFS. Furthermore, there is currently little or no support for the establishment and training of a Trauma Nurse Coordinator who would be responsible for PI.
- Additional comments reflected that for the trauma medical director to exert sufficient influence in their area they need the ability to conduct site visits. The current manning does not easily allow the trauma directors the freedom and ability to travel because their primary responsibility is to perform surgery at the Role 3 where they are assigned and the Role 3 staff cannot currently support the absence of one surgeon for even short periods.
- The trauma medical directors for CJTF-OIR and CJTF-OFS are also the Chief Medical Officer (Deputy Commander for Clinical Services—DCCS). During periods of low operational tempo, this is a feasible construct; however, during times of high patient volumes it would not be possible to perform well in the roles of trauma surgeon, Theater Trauma Medical Director, and Chief Medical Officer (DCCS). There are too many tasks within each of those responsibilities to perform effectively during times of even moderate operational tempo.
- OIR and CJTH Role 3, BAF do not have any nurse specifically assigned to PI or to assist with the trauma system; they only rely on distant JTS support from the continental U.S. KAF Role 3 did designate a PI nurse, although no pre-deployment training was provided.

## 90-DAY BOOTS ON GROUND (BOG) PROGRAM

- The Army is currently the only service who places medical providers in country for 90 days at a time. The goal of this program is that Reserve providers are not away from their civilian practice for longer than 90 days, and it is considered a retention tool to keep them serving. Currently, many deployed positions allocated to Army Reserve providers are unable to be filled by reservists and such 90-day rotations are

frequently filled by Active Duty, particularly for surgeons. The on-ground reality of this program includes multiple unintended consequences, mostly affecting surgical teams. One of the consequences includes placing low-ranking officers in charge of senior officers, such as First Lieutenants and Captains in charge of Colonels, since senior personnel in these units are not with the unit long enough to accept responsibility and may not be familiar with the mission.

- Another unit expressed multiple concerns over 90-day BOG surgeons. Staff did not feel like "BOGgers" had sufficient overlap with their replacements and that the providers were not there long enough to integrate into the team. The team also stated that the list of incoming Reserve personnel is not accurate and there is no way to get good communication with incoming personnel to brief the mission and in-theater requirements. Such providers frequently do not attend pre-deployment training with the rest of the team.
- A reserve FST with very experienced leadership reported that they had numerous problems with active duty surgeons and nurse anesthetists. The team stated that they were able to approve deployment to their team for specific Reserve surgeons, however they had no ability to review or screen Active Duty surgeons deployed to their unit. This resulted in deployment of some providers who were not capable of performing the mission.

## EN ROUTE CRITICAL CARE NURSES (ECCN)

- Overall discussion of this program was positive except for some implementation concerns. The concerns centered on the amount of time required to complete aircraft progressions, up to 30 days in several cases, prior to moving forward to operational areas. The amount of time required on the aircraft was variable and led to delays for ECCNs getting to MEDEVAC sites. 10 hours of aircraft progression time is required for "crew member" status while 4 hours is required for "passenger" status. Recently, the progression time was reduced to 4 hours to allow them to get into theater quicker; however, this results in a lesser trained person which affords less flexibility for MEDEVAC units. Additionally, when an ECCN redeploys, MEDEVAC units may have no ECCN in theater while the incoming ECCN is conducting aircraft progressions in Kuwait.
- The primary pre-deployment training course for ECCNs is the Joint En Route Care Course (JECC) and is a requirement that is universally enforced.
- Generally, the ECCNs were considered valuable assets when transporting casualties from Role 2 to Role 3 facilities but added limited capability on point of injury missions.
- There is a significant disparity in ECCN coverage between OIR and OFS. OIR has ECCNs assigned to every MEDEVAC location (total 8 ECCNs) while OFS has only 2 ECCNs, both assigned to BAF. Role 2 to Role 3 transfer missions are being conducted without ECCN coverage at KAF.
- ECCN is not a career pathway—nurses are all hospital ICU specialists and there is no pathway for nurses to specialize in en route critical care. Some nurses will obtain a highly valued skill set in emergency, critical care, and transport medicine. Sustainment and training of these skills is paramount. Advancement opportunities within this career field must be created and managed.

### NON-SURGICAL RESUSCITATION TEAMS

This is a capability that is emerging to help mitigate gaps in surgical team coverage. Currently, there are only a few such teams in the CENTCOM AOR, however there is a significant demand worldwide. In Iraq, the 3rd Brigade 10th Mountain Division designated a PA and 2 medics as an improvised "forward mission team" to conduct damage control resuscitation when the MEDEVAC response was expected to be greater than 1 hour (generally the anticipated MEDEVAC response time is less than 2 hours). The team carries 2-8 units of whole blood. The PA also added the capability for chest tubes and airway, compared to only medics. An Emergency Medicine physician was assigned to support this mission on the prior rotation. Similar to some surgical teams, this team was put together ad hoc, without supporting doctrine, training, or equipping; therefore, the success of the team pivoted on the capability of the lead clinician. The only training received by members assigned to the resuscitation team was standard TCMC training for the PA and BCT3 for all medics. They did not receive any additional training specific for the forward damage control resuscitation mission, however the PA was a previous critical care nurse and the team members conducted additional blood transfusion training in theater. There is no dedicated pre-deployment training course available for such teams.

## 20.0 SUMMARY: PERSONNEL

- The position of deployed CENTCOM Trauma System Director has been assigned to the lead Role 3 trauma surgeon in each theater.
- This structure functions adequately during periods of low operational tempo, however the position is limited by assignment within TF MED, daily responsibilities at the Role 3, and lack of adequate manning to allow the trauma directors the time and flexibility to travel to outlying sites.
- There is no designated Trauma Nurse Coordinator within the CENTCOM Trauma System.
- There are many unintended problems related to the 90-day "Boots on Ground" program for Army Reservists. Time for pre-deployment training and overlap with outgoing team members is minimized. An additional consequence includes placing low-ranking officers in charge of senior officers.
- The en route critical care nursing program has proven highly successful.
- There is no career pathway to develop expertise in en route nursing care.
- DCR teams have been improvised ad hoc in theater. There is no formal training or doctrine to support this mission, and as such no logistical set or mission capability expectations exist.

## 21.0 RECOMMENDATIONS: PERSONNEL

1. Add an additional senior trauma surgeon as the CENTCOM trauma medical director and a senior trauma nurse coordinator to support the CTS. Provide trauma system education to assigned personnel prior to deployment. (OPR CENTCOM SG, OCR JTS)
2. Reassess implementation of 90-day BOG program. (OPR ARMY SG, CENTCOM SG, SERVICE SGs)
    a. Allow deployed leaders access to physician evaluations from past deployments. (OPR CENTCOM SG)
    b. Remove 90-day BOG positions from surgical teams assigned to SOF. (OPR USAR Command; OCR SOCOM)
    c. Increase volunteer opportunities for unfilled deployment positions across all three services, active duty and reserve. (OPR SERVICE SGs)
3. Provide quality oversight and peer review for professionals deploying in PROFIS positions, and allow units to access prior performance reports. (OPR SERVICE SGs)
4. Army update PROFIS provider deployment and unit preparation. (OPR ARMY SG)
5. Services update unit/team deployment preparation and provide report to CENTCOM SG (OPR SERVICE SGs)
6. Add Emergency Medicine physician to all Role 2 manning documents. (OPR SERVICE SGs)
7. Review and refine a career pathway for en route care nurses. (OPR SERVICE SGs)
    a. Standardize equipment, training, protocols, and readiness level progression for ECCNs.
    b. Assign ECCNs to MEDEVAC units prior to pre-deployment training.
    c. Deploy ECCNs with MEDEVAC unit for duration of unit deployment.
    d. Develop and formalize ECCN Military Occupational Specialty (MOS); basic and advanced; teaching, leadership, and mentorship positions; and commensurate opportunities for career advancement and management within this specialty.
8. ECCNs complete aircraft progressions prior to deployment. (OPR ARMY SG)
    a. If this is not possible, ECCNs should overlap in order to maintain continuous coverage using outgoing ECCNs. (OPR ARMY SG, CENTCOM SG)

# 22.0 FACILITIES

- The lack of an accepted medical facility standard in CENTCOM causes confusion and concern for medical personnel accustomed to stateside standards. All medical facilities in CENTCOM (except for the Navy Clinic in Bahrain) are expeditionary and are exempt from accepted industry standard requirements such as the Joint Commission (JC). Some locations are hesitant to perform non-emergent surgical procedures because operating room air exchange does not meet Association of peri-Operative Registered Nurses (AORN) standards. The opposite also occurs where facilities offer services without appropriate risk assessment.
- History and recent experience has shown that such facilities are not short-term commitments.

- Building maintenance and facility upgrades are challenging. The Role 3s at KAF and BAF have problems keeping sterilizers functioning. At KAF, there has been a lengthy exchange between USFOR-A, NATO, and Army on who would pay for construction and facility upgrade to get new sterilizers.
- Role 3 facilities are increasingly attempting to apply U.S. standards to operating room facilities. This has resulted in mission shut-down in both Kuwait and Qatar, with a halt on elective and semi-elective surgeries within CENTCOM. The situation has been partially remedied at Camp Arifjan, Kuwait where a dehumidifier has been installed in the operating rooms that is able to meet the U.S. standard in this regard, although the new system requires manual drainage every 2 hours. The situation at Al Udeid Air Base in Qatar does not appear to have a solution within the current facility. In Bagram, the operating room does not meet U.S. standard for air exchange, dehumidification, or clean/dirty utility, and the central portion of the facility is not hardened, however the mission has not been interrupted. Additional, major retrofitting and upgrading is being attempted at the Bagram Role 3 after several years of cost assessments.
- The impact is that some of the more urgent surgical procedures are pushed back to the Role 3s within the combat zone and others are pushed on to LRMC in Germany, while surgical teams sit idle in the Kuwait and Qatar locations. Major facility modifications are undertaken with significant cost and mission impact.
- The Role 3 at Camp Arifjan is not on any evacuation chain route, although the facility has robust capabilities. It is located greater than a 1.5 hour drive from the main U.S. airfield at Ali Al Salem Air Base.
- Routine evacuations from OIR will frequently stop in Kuwait while awaiting further transportation or occasionally for higher-level medical care at the Role 3. Medical and emergency general surgery cases are occasionally transferred to the Role 3 at Camp Arifjan; however, this is not common and the Role 3 in Kuwait is somewhat extraneous to the system. Patients that require emergency cardiology or interventional radiology procedures (i.e. cardiac catheterization or sub arachnoid hemorrhage) need to go to local Kuwait hospitals.
- Role 2 and 3 facilities are set up differently at every location, with new and unique challenges at each site relating to sub-optimal and backward patient flow, clean and dirty utility issues, etc. Although buildings of opportunity are used when available, many of these facilities are set up by the U.S. as tent structures or newly constructed facilities seemingly built from scratch each time.

# 23.0 SUMMARY: FACILITIES

- The lack of an accepted medical treatment facility standard in CENTCOM causes confusion and concern for medical personnel accustomed to stateside standards.
- Role 3 facilities are increasingly attempting to apply U.S. standards to operating room facilities. This has resulted in mission shutdown in both Kuwait and Qatar, with a halt on elective and semi-elective surgeries within CENTCOM.
- History and recent experience has shown that such facilities are not short-term commitments.
- Role 2 and 3 facilities are set up differently at every location, with new and unique challenges at each site.

# 24.0 RECOMMENDATIONS: FACILITIES

1. Develop and publish CCSG position paper outlining basic decision criteria for expeditionary facilities. (OPR JFS)
2. When constructing fixed facilities in deployed locations, plan for long-term commitment and construct the facility to high standards with the goal of meeting U.S. standards, particularly within the operating room complex. Retrofitting and upgrading the facilities is complex and expensive. (OPR JFS)
3. Construct major medical facilities (Role 3 and Role 4) on an Air Base with runways meeting C-17 military transport aircraft requirements. (OPR JFS)
4. Develop standardized Role 2 (mobile and fixed) and Role 3 facility plans and implement across the services. (OPR JFS)

# 25.0 POLICY

## GOLDEN HOUR AND ROLE 2 TRAUMA OVERSIGHT

- The "Golden Hour" policy has driven the forward deployment of numerous non-doctrinal minimalist surgical teams to support the goal of reaching surgical capability within 1 hour. However, multiple challenges with assessing the performance of these "mission support" surgical teams has resulted in a void of knowledge in regard to the outcomes of patients treated by such teams.
- The pros and cons of this policy are far ranging but most felt the decision to operate outside of the golden hour should reside with mission commanders who conduct appropriate risk assessment.
- There is a lack of clinical oversight and participation in performance improvement tracking for some Role 2 surgical teams. Adherence to performance improvement policies and trending compliance with CPGs relies on surgical teams to voluntarily submit medical records to JTS. Role 2s assigned to TF Med may receive greater supervision given they report directly to the Role 3 and fall under the Deputy Commander of Clinical Services (DCCS) who is a trauma surgeon. FSTs assigned to support SOF report to the SOTF surgeon and do not follow TF Med policies, to include quality and performance improvement.
- There are several surgical teams, particularly austere surgical teams assigned to SOF, who do not submit any medical records and do not comply with any system-level performance improvement. The outcomes of care by single-surgeon teams are unknown, and little data has been collected in the trauma registry. There is no formal peer review for many Role 2 providers. There is no method of accountability.
- SOCOM documentation policies do not require submission of medical records. In many cases only classified AARs are created.

## MEDICAL RULES OF ENGAGEMENT (MEDROE)

- Very restrictive MEDROEs restrict access to U.S. surgical capabilities. This results in the majority of surgical teams sitting idle for months at a time and inability to develop decision-making skills or sustain clinical skills needed to perform life-saving interventions.
- TF MED in OIR ran a weekly Iraq Army Restorative Surgery Clinic on the Iraqi Base. Weekly cases were generated from this clinic which helped maintain readiness. This effort took full support from the TF MED Commander and the TMD.
- A minor adjustment to MEDROEs would have numerous positive effects on the trauma system performance and improve host nation capability development if these efforts are coordinated within the host nation medical system.

## COMMANDER'S CRITICAL REPORTING (CCR)

There are numerous and redundant reporting requirements for units, complicated by the complex organizational structure with overlapping responsibility and requirements. There is little or no medical performance improvement data tracked by the medical command, and most of the information transferred is related to personnel, logistics, or patient movement.

## MEDICAL RECORDS

- It is CENTCOM policy as well as standard of care for all medical caregivers worldwide to document care provided. Standard documentation forms required by JTS for trauma care include the DD Form 1380 Tactical Combat Casualty Care card, DA Form 4700 Patient Care Record, and the DD Form 3019 Resuscitation Record. In spite of ongoing efforts in theater for over a decade, many care providers do not document care, or documentation does not reach the permanent medical record or trauma registry. Barriers to performance improvement and implementation of documentation include:
    1. Lack of visibility of total patients treated.
    2. Multiple patients treated and not documented.
    3. Lack of understanding that documentation is required for U.S military, non-U.S. military, and host nation casualties.
    4. Hand-written records may be completed but are then sent with the patient to host-nation hospitals without maintaining a local copy.
    5. Hand-written records completed and evacuated with casualty but lost at higher role of care.
    6. Local line commanders prohibiting documentation due to perceived operational security (OPSEC) concerns.
    7. Inability of task-saturated caregivers to provide medical care and document simultaneously.
    8. Lack of knowledge of medical AAR processes.
    9. Inability to scan records in many locations due to the austerity of the location or restrictions imposed by base leadership.

10. Non-availability of secure means of photographing and forwarding medical records.

- There is no system to capture medically relevant photo-documentation (wounds, burns, etc) into the medical record.
- Many medical personnel are not aware that records and/or medical AARs can be completed at a later time and then forwarded electronically to JTS. Although AAR completion is standard practice for all MEDEVAC units, who routinely achieve 85-90% record completion rates, many point of injury providers and surgical teams do not know about this option.
- Many units are not aware of the CENTCOM trauma naming policy to create a standard pseudo-name and maintain the same pseudo-name through various roles of care. This results in one patient having multiple names or multiple patients having the same name so that even if records are received, they cannot be matched to one individual.
- The current procedure to submit trauma records to JTS requires 3 steps:
    1. Document care provided (handwritten or electronic).
    2. Upload all documentation, including scanned handwritten documents and electronically completed forms, into TMDS (at Role 2 or closest Role 3).
    3. Send a trauma log to JTS.

### CLINICAL PRACTICE GUIDELINES

- The indications for TXA use need to be reviewed and clarified. There is a lot of confusion about the indications to give TXA. Multiple providers asked whether TXA can be given more quickly, for example as a slow push dose, rather than over 10 minutes as currently recommended.
- TXA ampules break—need to ensure vials are available, especially for prehospital use.

## CCFP STANDARD MEDICAL OPERATING GUIDE (SMOG)

- In 2014, flight medic guidelines were created and standardized through the Medical Evacuation Proponency Directorate (MEPD). Prior to that time, each aviation brigade created their own set of medic protocols and guidelines. The most recent version of MEPD standardized flight medic guidelines was updated in 2018 and is currently under review by the JTS Committee on Enroute Combat Casualty Care (CoERCCC). However, by policy, the guidelines still require approval by each individual brigade surgeon. It is not clear to the brigade surgeon why this is required and whether they are allowed to change the guidelines
- There is no standard protocol for nerve agent exposure in the SMOGs.
- There is no crush injury protocol in the SMOGs.

### TCCC GUIDELINES

- Ranger medics have implemented calcium administration prehospital in conjunction with blood transfusion.
- Several units remarked that the antibiotic ertapenem was expensive and most doses were wasted. Cefazolin was suggested as a possible alternative. Since essentially all patients arrive to a higher level of care quickly, the need for a once-daily dose may not be needed.
- Why has CoTCCC endorsed the CricKey? The majority of medics do not like it.
- Ketamine is great—50 mg IM initial dose works great.
- Advanced resuscitation capability is also needed. More far-forward medical providers (physician assistants, physicians) can facilitate enhanced casualty collection point capability. The smaller the team gets, the more the individual skills matter.

# 26.0 SUMMARY: POLICY

- The "Golden Hour" policy[9] has driven the forward deployment of numerous non-doctrinal minimalist surgical teams to support the goal of reaching a surgical capability within 1 hour. However, multiple challenges with assessing the performance of these "mission support" surgical teams have left a void of knowledge in regard to the outcomes of patients treated by such teams.
- There is a lack of clinical oversight and participation in performance improvement tracking for some Role 2 surgical teams.
- The CENTCOM theater entry training requirements do not meet all JTS-recommended training and the policy should be updated.
- It is CENTCOM policy as well as standard of care for all medical caregivers worldwide to document care provided, however there is currently no means of enforcing this policy.
- SOCOM documentation policies do not require submission of medical records. In many cases only classified AARs are created.
- Adherence to performance improvement policies and trending compliance with CPGs relies on surgical teams to submit medical records to JTS.
- Many units are not aware of the CENTCOM trauma naming policy. This results in one patient having multiple names or multiple patients having the same name so that even if records are received, they cannot be matched to one individual.
- There is a lot of confusion about the indications to administer TXA.

# 27.0 RECOMMENDATIONS: POLICY

1. Provide critical review of "Golden Hour" policy[9] to include review of trauma casualties and medical treatment facility (MTF) utilization and provide recommendation on keeping or updating the policy. (OPR CENTCOM SG)

a. Mandate and enforce documentation of care provided by all surgical teams in theater to complete critical review of "Golden Hour" policy.

2. CENTCOM expand efforts to enforce medical documentation policies. (CENTCOM CDR and CENTCOM SG)

3. SOCOM review, train, and enforce medical documentation policies. Enforce creation and submission of unclassified medical records to meet JTS standards. (OPR SOCOM SG)

4. CENTCOM surgeon work with JTS to review and update medical training guidance for theater entry. (OPR CENTCOM SG and JTS)

   a. Service components update line remarks for medical personnel after publication of updated CENTCOM medical training requirements. (OPR AFCENT, ARCENT, NAVCENT)

5. Expand CENTCOM Medical Rules of Engagement (MROE) to increase treatment of Host Nation (HN) casualties. (OPR CENTCOM CDR)

   a. Commanders of medical units perform an analysis on the impact of accepting additional HN casualties at their facility and make recommendations to the JTF Commander on increasing utilization of their facilities. (OPR CENTCOM SG)

   b. Explore novel solutions and support local efforts for in-theater sustainment training to include increased availability of simulation training and improved "virtual" training platforms. (OPR CENTCOM SG)

6. The CENTCOM Surgeon office is participating in a capabilities-based assessment (CBA) sponsored by the Office of the Joint Staff Surgeon to address medical readiness skill sustainment during deployment operations (MRSS-DDO). Review CBA recommendations when available. (OPR JFS, CENTCOM SG)

7. Standardize PI reporting requirements across each role of care with oversight of TMD and TNC in the AOR. (OPR CENTCOM SG)

   a. Establish required reporting mechanism from TMD to JTS and CENTCOM SG and reduce reporting redundancy across commands.

8. Provide additional information on medical record requirements and de-conflict policy with PASBA deployed medical record handbook. (OPR CENTCOM SG)

9. Update JTS Battle and Non-battle Injury Documentation CPG and increase education on documentation requirements and medical AAR submission. (OPR JTS, CENTCOM SG)

10. Update DoDI 6480.40, Armed Services Blood Program Operational Procedures, dated 13 August 2012, incorporating Change 1 effective 2 October 2013,[12] to prioritize and facilitate delivery of whole blood to deployed prehospital and surgical teams. (OPR ASBPO)

11. Improve technical solutions for scanning hand-written records to include a photo-encryption application approved for government phones which automatically generates an encrypted email to JTS. (OPR DHA/Theater Functional Working Group, OCR AT&L/JOMIS)

12. JTS create a standard report of records received and report to CENTCOM medical leadership. (OPR JTS)

13. CoTCCC review TXA administration guidelines and teaching material. (OPR JTS)

14. CoTCCC review antibiotic recommendations, consider more cost-effective solution. (OPR JTS)

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# 29.0 ITINERARY

29 Jan 2018 .....COL Linck and Col Shackelford arrive Kuwait

30 Jan 2018 .....Meet with Camp Arifjan Role 3 staff

31 Jan 2018.....COL Linck and Col Shackelford meet with OIR Surgeon
MEDEVAC OIR brief
Meet with SOJTF-OIR Surgeon

1 Feb 2018 .....COL Gurney, 1SG, CPT travel to Al Asad
Meet with Role 2
Meet with DUSTOFF, C Company 1/189th

1 Feb 2018 .....COL Linck and Col Shackelford arrive BDSC

2 Feb 2018 .....COL Linck, Col Gurney, Col Shackelford, 1SG, CPT travel to Erbil
Meet with U.S. Role 1, 501st ASMC
Meet with Canadian/German Role 2
Meet with U.S. Role 1, 217/1st Cavalry Division
Meet with JMAU surgical team
Meet with DUSTOFF, South Dakota National Guard

3 Feb 2018 .....COL Linck, COL Gurney, Col Shackelford travel to Q West
Meet with Navy EMU
Meet with U.S. Role 1, 710 BSB/3rd BDE 10th MTN
Meet with BDE surgeon 3/10 MTN
Meet with DUSTOFF, C-1/189 Oregon National Guard

3-4 Feb 2018 .....COL Linck, COL Gurney, Col Shackelford travel to Bagram

5 Feb 2018 .....Meet with CJTH Role 3 staff
Meet with RS PECC OIC
Meet with DUSTOFF, C Co 2-3 Aviation Regiment
Meet with 3/75 Ranger medics/PA

6 Feb 2018 .....Meet with AE/CCATT
Meet with Role 1, 2-501 Parachute Infantry Regiment and 4-3 Assault Helicopter Battalion medics and battalion surgeon
Meet with 4555 ERQS Pararescue
Meet with 10 SFG, 2nd BTN surgeon, PA, Senior Medic, and SOJTF-A surgeon

7 Feb 2018 .....COL Linck and Col Shackelford travel to JAF
Meet with 555 FST, Role 2: 7-25 BDE support BTN, Role 1: 501st Infantry BTN

Meet with DUSTOFF, C 2-3
Meet with OGA medics

8 Feb 2018 .....COL Linck and Col Shackelford travel to Dahlke
Meet with Dahlke FST
Meet with Dahlke 18Ds
Meet with DUSTOFF, C 2-3

9 Feb 2018 .....Travel to KAF
Meet with KAF Role 2 SOJTF GHOST team and 10 SFG BTN SG +18D

10 Feb 2018 .....Teleconference with Dwyer, Navy Role 2
Teleconference with Shorab, Navy Role 2
Meet with DUSTOFF, 3rd ID CAB, C Co 2-211 GSAB Det 1
Meet with Role 3 Staff and Army 250th FST

11 Feb 2018 .....Meet with JMAU surgical team

11-12 Feb 2018 ...Travel

# APPENDIX A: PREHOSPITAL/ROLE 1 SURVEY RESULTS

**PREHOSPITAL/ROLE 1 SURVEY RESULTS**: A total of 43 units replied to the survey with 60% complete response rate. This survey included questions that were covered in the 2013 prehospital trauma system assessment, along with additional questions. Results for questions surveyed in 2013 are included for comparison.

Survey instructions: This survey is for medics, operational physicians, and all role 1 providers who provide, or may provide, care to traumatically injured patients. Results will be used to update TCCC and JTS guidelines and improve combat casualty care. Surgical teams should complete the Role 2 survey. One team member should complete the survey for each unit, with input from team members. If the unit is separated at more than one site, one team member at each site should complete the survey.

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| 1. What is your theater of operations? | OFS | 37% | 16 | |
| | OIR-I | 53% | 23 | |
| | OIR-S | 9% | 4 | |
| | | Skipped | 0 | |
| 2. What service do you belong to? | Army | 95% | 41 | |
| | Navy | 2% | 1 | |
| | Air Force | 2% | 1 | |
| | | Skipped | 0 | |
| 3. What type of unit do you belong to? (check all that apply) | SOF | 14% | 6 | |
| | Conventional | 51% | 22 | |
| | Active Duty | 51% | 22 | |
| | Reserve | 32% | 14 | |
| | | Skipped | 0 | |
| 4. What is your primary medical mission? | Primary care (clinic, aid station) | 60% | 25 | |
| | Point of injury (prehospital) care | 10% | 4 | |
| | MEDEVAC | 24% | 10 | |
| | Other | 7% | 3 | |
| | | Skipped | 1 | |
| 5. What specialty is your unit Medical Corps officer? | Family Practice | 14% | 6 | |
| | Emergency medicine | 10% | 4 | |
| | Internal Medicine | 14% | 6 | |
| | GMO | 7% | 3 | |
| | Surgeon | 5% | 2 | |
| | Other | 50% | 21 | |
| | | Skipped | 1 | |
| 6. What additional licensed providers are in your unit? | Physician Assistant | 79% | 33 | |
| | Registered Nurse | 33% | 14 | |
| | | Skipped | 0 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| 7. What type of medics are in your unit? (check all that apply) | EMT-B | 52% | 22 | |
| | EMT-A | 7% | 3 | |
| | EMT-P | 48% | 20 | |
| | 68W | 76% | 32 | |
| | 68WW1 | 5% | 2 | |
| | 18D | 7% | 3 | |
| | PJ | 0% | 0 | |
| | SOIDC | 0% | 0 | |
| | IDMT | 2% | 1 | |
| | SEAL medic | 0% | 0 | |
| | SOCOM | 7% | 3 | |
| | CCFP | 12% | 5 | |
| | Corpsman | 5% | 2 | |
| | SOAR medic | 0% | 0 | |
| | SOTM | 0% | 0 | |
| | Civil Affairs Medic | 0% | 0 | |
| | Independent duty corpsman | 0% | 0 | |
| | Civilian medic / paramedic | 14% | 6 | |
| | None | 0% | 0 | |
| | Other | 12% | 5 | |
| | | Skipped | 1 | |
| 8. Is casualty response (TCCC training, medical training, prehospital trauma training, etc) listed as one of your unit commander's training priorities? | Yes | 83% | 29 | |
| | No | 17% | 6 | |
| | | Skipped | 8 | |
| 9. Is your unit commander accountable and responsible for your unit's casualty response system – does he have ownership? | Yes | 60% | 21 | |
| | No | 11% | 4 | |
| | Somewhat | 29% | 10 | |
| | | Skipped | 8 | |
| 10. Does your unit commander understand and support TCCC guidelines? | Yes | 74% | 26 | 62% |
| | No | 3% | 1 | 31% |
| | Somewhat | 23% | 8 | 8% |
| | | Skipped | 8 | |
| 11. Does your unit commander mandate and enforce TCCC principles and protocols? | Yes | 57% | 20 | |
| | No | 17% | 6 | |
| | Somewhat | 25% | 9 | |
| 12. Is TCCC incorporated into training, operations orders, drills, and planned for in all phases of mission execution? | Yes | 74% | 26 | 81% |
| | No | 9% | 3 | 15% |
| | Somewhat | 17% | 6 | 4% |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | | Skipped | 8 | |
| 13. Is your unit's TCCC capability included in commander's update reporting/unit status report (training, necessary equipment, medications)? | Yes | 71% | 25 | 12% |
| | No | 29% | 10 | 65% |
| | Somewhat | | 0 | 23% |
| | | Skipped | 8 | |
| 14. Prior to deployment (within 60 days) did your unit conduct an exercise of the entire units' casualty response capabilities? (Conducted at the platoon or company, or equivalent-size unit level, to include medical and non-medical first responder skills and line leadership skills for casualty response). | Yes | 67% | 23 | |
| | No | 34% | 12 | |
| 15. Is a TCCC Card (DD1380), TACEVAC patient care record, or trauma resuscitation record completed for every casualty?[10] | Yes | 83% | 29 | |
| | No | 17% | 6 | |
| | | Skipped | 8 | |
| 16. Does your unit review TCCC AARs, maintain a prehospital trauma registry, and/or otherwise have an internal performance improvement program to mitigate trauma morbidity and mortality? | Yes | 67% | 20 | |
| | No | 20% | 6 | |
| | N/A | 13% | 4 | |
| | | Skipped | 13 | |
| 17. Has your unit implemented TCCC documentation IAW DHA procedural instruction dated 20170120? | Yes | 57% | 17 | 77% |
| | No | 7% | 2 | 23% |
| | I don't know | 37% | 11 | |
| | | Skipped | 13 | |
| 18. Has your unit implemented prehospital casualty response and treatment protocols IAW 2017 DoD JTS and TCCC Guidelines? | Yes | 67% | 20 | |
| | No | 10% | 3 | |
| | Somewhat | 10% | 3 | |
| | I don't know | 13% | 4 | |
| | | Skipped | 13 | |
| 19. Has your unit implemented "TCCC for Medical Personnel" training IAW the 2017 USCENTCOM Commander's KIA reduction initiative? | Yes | 50% | 15 | |
| | No | 17% | 5 | |
| | Somewhat | 3% | 1 | |
| | I don't know | 30% | 9 | |
| | | Skipped | 13 | |
| 20. Has your unit implemented "TCCC for All Combatants" training IAW the 2017 USCENTCOM Commander's KIA reduction initiative? | Yes | 33% | 10 | |
| | No | 13% | 4 | |
| | Somewhat | 7% | 2 | |
| | I don't know | 47% | 14 | |
| | | Skipped | 13 | |
| 21. Has your unit submitted TCCC AARs to JTS? | Yes | 40% | 12 | |
| | No | 27% | 8 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | No traumas | 33% | 10 | |
| | | Skipped | 13 | |
| 22. Has your Medical Corps Officer completed C4 training? | Yes | 40% | 12 | 69% |
| | No | 20% | 6 | 27% |
| | N/A | 7% | 2 | |
| | I don't know | 33% | 10 | 4% |
| | | Skipped | 13 | |
| 23. Have your licensed pre-hospital providers (Physician/Physician Assistants/Nurses) completed TCMC or other service endorsed similar course? | Yes | 70% | 21 | 62% |
| | No | 3% | 1 | 27% |
| | N/A | 27% | 8 | |
| | | Skipped | 13 | |
| 24. What percentage of unit medics have completed BCT3 or other service endorsed similar course? | <20% | 7% | 2 | |
| | 21-40% | 3% | 1 | |
| | 61-80% | 7% | 2 | |
| | >80% | 73% | 22 | |
| | N/A | 10% | 3 | |
| | | Skipped | 13 | |
| 25. Are there any TCCC guideline protocols, skills, or medications that your medics are not allowed to perform or administer? | Yes | 7% | 2 | 81% |
| | No | 93% | 28 | 12% |
| | | Skipped | 13 | |
| 26. Are there any trauma protocols, skills, or medications trained by your medics that are different than those found in TCCC guidelines? | Yes | 17% | 5 | 42% |
| | No | 83% | 25 | 58% |
| | | Skipped | 13 | |
| 27. Do you participate in the Weekly Theater JTS Trauma DCS Conference? | Yes | 21% | 6 | 15% |
| | No | 31% | 9 | 85% |
| | Occasionally | 48% | 14 | |
| | | Skipped | 14 | |
| 28. Have you accessed the JTS website that has the latest TCCC guidelines and best practice guidelines CPGs? | Yes | 61% | 18 | 42% |
| | No | 38% | 11 | 58% |
| | | Skipped | 14 | |
| 29. Who serves as the instructors for unit's first responder/TCCC training? | Unit medics | 93% | 27 | |
| | External personnel | 7% | 2 | |
| | | Skipped | 14 | |
| 30. Are TCCC cards emphasized and actually completed with every training and evaluation exercise? | Yes | 59% | 17 | |
| | No | 34% | 10 | |
| | N/A | 7% | 2 | |
| | | Skipped | 14 | |
| 31. How frequently do combatants or non-medical first responders receive TCCC training? | Monthly | 28% | 8 | |
| | Quarterly | 24% | 7 | |
| | Annually | 28% | 8 | |
| | Other | 21% | 6 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | | Skipped | 14 | |
| 32. How frequently are your TCCC skills and trauma assessments evaluated with formalized simulation or within exercises? | Monthly | 31% | 9 | |
| | Quarterly | 38% | 11 | |
| | Annually | 17% | 5 | |
| | Other | 14% | 4 | |
| | | Skipped | 14 | |
| 33. Does this frequency of training and evaluation meet your needs for combat readiness? | Yes | 86% | 25 | |
| | No | 14% | 4 | |
| | | Skipped | 14 | |
| 34. While deployed, how frequently does your unit rehearse trauma resuscitations? | Weekly | 15% | 4 | |
| | Monthly | 37% | 10 | |
| | Quarterly | 30% | 8 | |
| | Other | 19% | 5 | |
| | | Skipped | 16 | |
| 35. While deployed, how frequently does your unit rehearse mass casualty response? | Weekly | 4% | 1 | |
| | Monthly | 44% | 12 | |
| | Quarterly | 41% | 11 | |
| | Other | 11% | 3 | |
| | | Skipped | 16 | |
| 36. Does your unit have adequate medical supplies required to perform all skills within TCCC guidelines? | Yes | 89% | 24 | 50% |
| | No | 11% | 3 | 38% |
| | Somewhat | | 0 | 12% |
| | | Skipped | 16 | |
| 37. Do you have adequate IFAKs/CLS/WALK AID BAGS in order to conduct your mission? | Yes | 85% | 23 | 92% |
| | No | 11% | 3 | 8% |
| | N/A | 4% | 1 | |
| | | Skipped | 16 | |
| 38. Are you receiving medical equipment as requested? | Yes | 70% | 19 | 38% |
| | No | 30% | 8 | 35% |
| | | Skipped | 16 | |
| 39. What system is being used to order class VIII? | DMLS | 7% | 2 | 7% |
| | DCAM | 67% | 18 | 58% |
| | Excel/Email | 22% | 6 | 35% |
| | Other | 4% | 1 | |
| | | Skipped | 16 | |
| 40. Do you have junctional tourniquets on hand? | Yes | 78% | 21 | 65% |
| | No | 22% | 6 | 27% |
| | | Skipped | 16 | |
| 41. Which junctional tourniquets does your unit have? | SAM JT | 80% | 16 | 46% |
| | JETT | 45% | 9 | 46% |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | CRoC | 10% | 2 | 4% |
| | Improvised JT | 25% | 5 | |
| | Other | 15% | 3 | |
| | | Skipped | 23 | |
| 42. What brand of chest seals are you using? | Hyfin unvented | 69% | 18 | 81% |
| | Halo unvented | 46% | 12 | 73% |
| | H&H unvented | 42% | 11 | 35% |
| | Bolin vented | 38% | 10 | 42% |
| | Other | 12% | 3 | |
| | | Skipped | 17 | |
| 43. Has your unit commander implemented a policy to appropriately procure, use, secure, account for, routinely inventory, and dispose of controlled medical items (e.g. narcotics)? | Yes | 96% | 24 | |
| | No | 4% | 1 | |
| | | Skipped | 18 | |
| 44. Do you minimize use of platelet-inhibiting drugs (e.g. aspirin, Motrin, other COX-1 NSAIDs) in individuals who conduct hazardous or combat missions? | Yes | 68% | 17 | |
| | No | 32% | 8 | |
| | | Skipped | 18 | |
| 45. Are you using TCCC guideline recommended pain medications for pain management? | Yes | 84% | 21 | 42% |
| | No | 4% | 1 | 12% |
| | Unsure | 12% | 3 | |
| | | Skipped | 18 | |
| 46. Are you using TCCC guideline recommended Fentanyl lozenge? | Yes | 68% | 17 | 69% |
| | No | 32% | 8 | 31% |
| | | Skipped | 18 | |
| 47. Are you using TCCC guideline recommended Ketamine? | Yes | 88% | 22 | 50% |
| | No | 12% | 3 | 50% |
| | | Skipped | 18 | |
| 48. Are you using TCCC guideline recommended Wound (Combat) Pill Pack? | Yes | 32% | 8 | 4% |
| | No | 68% | 17 | 96% |
| | | Skipped | 18 | |
| 49. What pain management medications do your medics carry? | Morphine | 58% | 24 | 92% |
| | Fentanyl lozenge | 54% | 24 | 35% |
| | Ketamine | 76% | 25 | 12% |
| | Wound (Combat) Pill Pack | 22% | 23 | 4% |
| | | Skipped | 18 | |
| 50. Is your unit using TCCC guidelines for systemic antibiotics for trauma? | Yes | 72% | 18 | |
| | No | 28% | 7 | |
| | | Skipped | 18 | |
| 51. Which antibiotics are available in your unit? | Moxifloxin | 60% | 15 | 69% |
| | Ertapenem | 64% | 16 | 42% |
| | Wound (Combat) pill pack | 24% | 6 | 4% |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | None | 20% | 5 | |
| | Other | 24% | 6 | 27% |
| | | Skipped | 18 | |
| 52. Which type of Cricothyrotomy Kits do you have? | H&H | 76% | 19 | 58% |
| | Tactical Cric kit by North American Rescue | 64% | 16 | 42% |
| | CricKey | 24% | 6 | |
| | Non-standard (homemade) | 16% | 4 | 23% |
| | Other | 4% | 1 | |
| | | Skipped | 18 | |
| 53. Does your unit have the capability (trained and equipped) to place supraglottic or extraglottic airway? | Yes | 88% | 22 | |
| | No | 12% | 3 | |
| | | Skipped | 18 | |
| 54. If yes, what type of airway? | I-gel | 18% | 4 | |
| | King LT | 95% | 21 | |
| | Other | 9% | 2 | |
| | | Skipped | 21 | |
| 55. What type of tourniquets is your unit carrying? Select all that apply. | C-A-T | 100% | 25 | |
| | SOFTT wide | 52% | 13 | |
| | Other | 0% | 0 | |
| | | Skipped | 18 | |
| 56. What type of topical hemostatics is your unit carrying? Select all that apply. | Combat Gauze | 100% | 25 | |
| | Celox Gauze | 12% | 3 | |
| | Chitogauze | 16% | 4 | |
| | XStat | 16% | 4 | |
| | | Skipped | 18 | |
| 57. Do you use pelvic binders for severe blunt trauma and blast injuries? | Yes | 92% | 23 | 62% |
| | No | 8% | 2 | 23% |
| | | Skipped | 18 | |
| 58. What type of commercial pelvic binder do you use? Select all that apply. | SAM pelvic binder or junctional tourniquet | 72% | 18 | |
| | Pelvicbinder™ | 28% | 7 | |
| | T-POD | 8% | 2 | |
| | JETT | 8% | 2 | |
| | N/A | 8% | 2 | |
| | Other | 8% | 2 | |
| | | Skipped | 18 | |
| 59. Do you use improvised pelvic binders? | Yes | 52% | 13 | |
| | No | 48% | 12 | |
| | | Skipped | 18 | |
| 60. Do you have a pulse oximeter at BAS/R1 facility? | Yes | 96% | 24 | |
| | No | 4% | 1 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| | | Skipped | 18 | |
| 61. Do you have a pulse oximeter in medics' aid bags? | Yes | 88% | 22 | |
| | No | 12% | 3 | |
| | | Skipped | 18 | |
| 62. Do you have an ETCO2 monitor at BAS/R1 facility? | Yes | 68% | 17 | |
| | No | 24% | 6 | |
| | N/A | 8% | 2 | |
| | | Skipped | 18 | |
| 63. Do you have an ETCO2 monitor in medics' aid bags? | Yes | 32% | 8 | |
| | No | 60% | 15 | |
| | N/A | 8% | 2 | |
| | | Skipped | 18 | |
| 64. Do you have TXA at BAS/R1 facility? | Yes | 84% | 21 | 35% |
| | No | 12% | 3 | 62% |
| | N/A | 4% | 1 | |
| | | Skipped | 18 | |
| 65. Do you have TXA in medics' aid bags? | Yes | 60% | 15 | 8% |
| | No | 32% | 8 | 92% |
| | N/A | 8% | 2 | |
| | | Skipped | 18 | |
| 66. Does your unit have freeze dried plasma? | Yes | 8% | 2 | |
| | No | 92% | 23 | |
| | | Skipped | 18 | |
| 67. Does your unit have the capability (training and equipment) to transfuse stored whole blood? | Yes | 56% | 14 | |
| | No | 44 % | 11 | |
| | | Skipped | 18 | |
| 68. Does your unit have the capability (training and equipment) to draw fresh whole blood? | Yes | 68% | 17 | |
| | No | 32% | 8 | |
| | | Skipped | 18 | |
| 69. Does your unit perform hands-on training for fresh whole blood drawing and administration? | Yes | 72% | 18 | |
| | No | 28% | 7 | |
| | | Skipped | 18 | |
| 70. Do you have blood/fluid warmers at BAS/R1 facility? | Yes | 64% | 16 | |
| | No | 28% | 7 | |
| | N/A | 8% | 2 | |
| | | Skipped | 18 | |
| 71. Do you have blood/fluid warmers in medics' aid bags? | Yes | 36% | 9 | |
| | No | 64% | 16 | |
| | | Skipped | 18 | |
| | HPMK | 88% | 22 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| 72. What does your unit use to prevent casualty hypothermia? Select all that apply. | Rescue wrap | 36% | 9 | |
| | Space Blanket | 76% | 19 | |
| | Other | 16% | 4 | |
| | | Skipped | 18 | |
| 73. Is your unit expected to provide prolonged field care (PFC) of critical casualties? | Yes | 20% | 5 | |
| | No | 80% | 20 | |
| | | Skipped | 18 | |
| 74. Did your unit train on PFC scenarios prior to this deployment? | Yes | 24% | 6 | |
| | No | 76% | 19 | |
| | | Skipped | 18 | |
| 75. Which critical care capabilities does your unit have? | None | 4% | 1 | |
| | Ventilator | 64% | 5 | |
| | Monitor | 76% | 9 | |
| | AED | 80% | 9 | |
| | Ultrasound | 24% | 4 | |
| | Other | 20% | 1 | |
| | | Skipped | 18 | |
| 76. Is your unit trained to convert tourniquets in the field? (prior to handoff to a surgical team) | Yes | 80% | 20 | |
| | No | 20% | 5 | |
| | | Skipped | 5 | |
| 77. Have you accessed the JTS PFC guidelines? | Yes | 56% | 14 | |
| | No | 44% | 11 | |
| | | Skipped | 18 | |
| 78. Does your unit carry litters during dismounted operations? | Yes | 32% | 8 | |
| | No | 4% | 1 | |
| | N/A | 64% | 16 | |
| | | Skipped | 18 | |
| 79. Does your unit carry litters during mounted operations? | Yes | 56% | 14 | |
| | No | 4% | 1 | |
| | N/A | 40% | 10 | |
| | | Skipped | 18 | |
| 80. Does your unit plan, train, and conduct medical evacuation (MEDEVAC) using medical vehicles and aircraft? | Yes | 92% | 23 | |
| | No | 8% | 2 | |
| | | Skipped | 18 | |
| 81. Do your unit plan, train, and conduct casualty evacuation CASEVAC) using non-medical vehicles and aircraft? | Yes | 88% | 22 | |
| | No | 12% | 3 | |
| | | Skipped | 18 | |
| 82. Has your unit conducted training with the MEDEVAC unit that supports your unit? | Yes | 84% | 21 | |
| | No | 12% | 3 | |
| | N/A | 4% | 1 | |
| | | Skipped | 18 | |

| Results for OFS and OIR | | Percent | Number | 2013 Survey |
|---|---|---|---|---|
| 83. Has your unit trained and conducted hoist operations? | Yes | 60% | 15 | |
| | No | 40% | 10 | |
| | | Skipped | 18 | |
| 84. Do you know which units provide Role 2 and Role 3 MTF support to your unit in theater? | Yes | 96% | 24 | |
| | No | 4% | 1 | |
| | | Skipped | 18 | |
| 85. Did you train with your supporting Role 2 / Role 3 MTF prior to deployment? | Yes | 16% | 4 | |
| | No | 84% | 21 | |
| | | Skipped | 18 | |
| 86. Have you conducted medical training in theater with the Role 2 and/or Role 3 MTF that currently supports your unit? | Yes | 72% | 18 | |
| | No | 28% | 7 | |
| | | Skipped | 18 | |
| 87. Do you conduct telemedicine with supporting MTF? | Yes | 48% | 12 | |
| | No | 52% | 13 | |
| | | Skipped | 18 | |
| 88. Do you include telemedicine in training scenarios? | Yes | 20% | 5 | |
| | No | 80% | 20 | |
| | | Skipped | 18 | |
| 89. Do the Role 2 and Role 3 MTF personnel that support you understand TCCC and Role 1 care? | Yes | 96% | 24 | |
| | No | 4% | 1 | |
| | | Skipped | 18 | |
| 90. Do you include handoffs in training scenarios? | Yes | 84% | 21 | |
| | No | 16% | 4 | |
| | | Skipped | 18 | |
| 91. Do you conduct AARs with supporting MTFs? | Yes | 60% | 15 | |
| | No | 40% | 10 | |
| | | Skipped | 18 | |

# APPENDIX B: ROLE 2 AND ROLE 3 SURVEY RESULTS

**ROLE 2 AND ROLE 3 SURVEY RESULTS:** A total of 22 units replied to the survey with 86% complete response rate.

**Survey instructions**: This survey is for Role 2 and Role 3 surgical team members who provide, or may provide, care to traumatically injured patients. Results will be used to update JTS clinical practice guidelines and improve combat casualty care. Role 1, prehospital, and MEDEVAC teams should complete the Role 1 survey. One team member should complete the survey for each unit, with input from team members. If the unit is separated at more than one site, one team member at each site should complete the survey.

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 1. What service do you belong to? | Army | 55% | 12 |
| | Navy | 23% | 5 |
| | Air Force | 23% | 5 |
| | | Skipped | 0 |
| 2. What type of unit do you belong to? (check all that apply) | Conventional | 36% | 8 |
| | Active Duty | 73% | 16 |
| | Reserve | 27% | 2 |
| | SOF | 5% | 1 |
| | Other | 9% | 2 |
| | | Skipped | 0 |
| 3. What is your primary medical mission? | Role 2 surgical care | 73% | 16 |
| | Role 3 care (surgical and medical) | 27% | 6 |
| | | Skipped | 0 |
| 4. What additional licensed providers are in your unit? | Physician Assistant | 18% | 4 |
| | Registered Nurse | 100% | 22 |
| | | Skipped | 0 |
| 5. What type of medics are in your unit or do you work with on a regular basis? (check all that apply) | EMT-B | 36% | 8 |
| | EMT-A | 5% | 1 |
| | EMT-P | 23% | 5 |
| | 68W | 68% | 15 |
| | 18D | 36% | 8 |
| | PJ | 9% | 2 |
| | IDMT | 5% | 1 |
| | Corpsman | 50% | 11 |
| | NSW Special Operations Tactical Medic (SOTM) | 5% | 1 |
| | Independent duty corpsman | 9% | 2 |
| | Civilian medic / paramedic | 9% | 2 |
| | Other | 32% | 7 |
| | | Skipped | 0 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 6. What percentage of medical staff of the unit/team/MTF attends the Thursday JTS Conference? | None | 18% | 4 |
| | 1-10% | 5% | 1 |
| | 11-30% | 18% | 4 |
| | 31-49% | 9% | 2 |
| | 50-75% | 27% | 6 |
| | 76-90% | 9% | 2 |
| | >90% | 14% | 3 |
| | | Skipped | 0 |
| 7. Does your Commander attend the Thursday JTS Conference? | Yes | 32% | 7 |
| | No | 32% | 7 |
| | Sometimes | 36% | 8 |
| | | Skipped | 0 |
| 8. Does your unit commander understand and support the JTS Clinical Practice Guidelines? | Yes | 100% | 22 |
| | No | | |
| | | Skipped | 0 |
| 9. Is there a policy statement signed by the Commander or OIC which confirms commitment to trauma system participation, Unit Performance Improvement and System wide Performance Improvement? | Yes | 23% | 5 |
| | No | 23% | 5 |
| | Unsure | 55% | 12 |
| | | Skipped | 0 |
| 10. Is there a policy statement signed by the Commander or OIC which requires support for the DoDTR? | Yes | 27% | 6 |
| | No | 23% | 5 |
| | Unsure | 50% | 11 |
| | | Skipped | 0 |
| 11. Is there a mechanism for all your trauma records to get into the DoDTR? | Yes | 86% | 19 |
| | No | 5% | 1 |
| | Unsure | 9% | 2 |
| | | Skipped | 0 |
| 12. Prior to deployment (within 60 days) did your unit conduct an exercise of the entire units' casualty response, triage, trauma and OR capabilities? | Yes | 68% | 15 |
| | No | 18% | 4 |
| | Unsure | 13% | 3 |
| | | Skipped | 0 |
| 13. Does your unit/team/MTF conduct AARs after MASCAL exercises or MASCALs? | Yes | 100% | 21 |
| | No | | |
| | | Skipped | 1 |
| 14. Is your unit equipped for GHOST team missions? | Yes | 19% | 4 |
| | No | 62% | 13 |
| | N/A | 19% | 4 |
| | | Skipped | 1 |
| 15. Is your unit performing GHOST team or GHOST team-like missions? | Yes | 24% | 5 |
| | No | 76% | 16 |
| | | Skipped | 1 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 16. Has your unit been specifically trained to perform GHOST team/GHOST team-like missions? | Yes | 80% | 4 |
| | No | 20% | 1 |
| | | Skipped | 17 |
| 17. Are the MEDROE clearly understood by leadership? | Yes | 100% | 21 |
| | No | | |
| | | Skipped | 1 |
| 18. Does your team/unit/MTF have relationships with the any of the below? (check all that apply) | International coalition units | 86% | 18 |
| | C CO Medical Company or other linked unit | 33% | 7 |
| | MEDEVAC | 95% | 20 |
| | En Route Critical Care | 48% | 10 |
| | SOJTF (or any of the SOF teams) | 76% | 16 |
| | Blood Support Detachment | 81% | 17 |
| | Host National Medical Resources in the AOR | 67% | 14 |
| | POC and mechanisms to transport non-US mil patients. | 91% | 19 |
| | Other | 5% | 1 |
| | | Skipped | 1 |
| 19. Does your unit/team/MTF have a trauma or clinical leader experienced in trauma? | Yes | 100% | 21 |
| | No | | |
| | | Skipped | 1 |
| 20. Does your unit/team/MTF know how to contact the theater Trauma Director / (Trauma Czar)? | Yes | 87% | 18 |
| | No | 14% | 3 |
| | | Skipped | 1 |
| 21. Do you receive timely notification regarding incoming casualties? | Yes | 90% | 19 |
| | No | 5% | 1 |
| | N/A | 5% | 1 |
| | | Skipped | 1 |
| 22. Does your unit have a reliable trauma notification system? | Yes | 81% | 17 |
| | No | 19% | 4 |
| | | Skipped | 1 |
| 23. Does your unit/team/MTF have reliable logistical support? | Yes | 38% | 8 |
| | No | 14% | 3 |
| | Somewhat | 48% | 10 |
| | | Skipped | 1 |
| 24. Are you co-located with MEDEVAC? | Yes | 48% | 10 |
| | No | 48% | 10 |
| | Occasionally | 5% | 1 |
| | | Skipped | 1 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 25. Do you train with your MEDEVAC Team? | Yes | 67% | 14 |
| | No | 29% | 6 |
| | N/A | 5% | 1 |
| | | Skipped | 1 |
| 26. How many ground ambulances does your unit/team/MTF have? | 0 | 48% | 10 |
| | 1 | 33% | 7 |
| | 2 | 10% | 2 |
| | 3 | 10% | 2 |
| | | Skipped | 1 |
| 27. Do you use Gators for patient transport? | Yes | 14% | 3 |
| | No | 86% | 18 |
| | | Skipped | 1 |
| 28. How many Gators do you have for litter transport? | N/A | 81% | 17 |
| | 1 | 5% | 1 |
| | 2 | 10% | 2 |
| | ≥ 3 | 5% | 1 |
| | | Skipped | 1 |
| 29. How many Rickshaws do you have for litter transport? | None | 14% | 3 |
| | 1 | 0% | 0 |
| | 2-3 | 14% | 3 |
| | 4-5 | 10% | 2 |
| | 6-8 | 29% | 6 |
| | >8 | 33% | 7 |
| | | Skipped | 1 |
| 30. In preparing a patient for fixed or rotary wing transport: | | | |
| Do you have equipment transfer SOPs? | Yes | 67% | 14 |
| | No | 71% | 4 |
| | Unsure | 14% | 3 |
| Do you have a resupply SOP? | Yes | 71% | 15 |
| | No | 14% | 3 |
| | Unsure | 14% | 3 |
| Do you have a mechanism for equipment accountability? | Yes | 81% | 17 |
| | No | 5% | 1 |
| | Unsure | 14% | 3 |
| Is there a procedure for record/chart management? | Yes | 95% | 20 |
| | No | 5% | 1 |
| | Unsure | 0% | 0 |
| Is there an understanding of narcotic and medication management for flight? | Yes | 90% | 19 |
| | No | 5% | 1 |
| | N/A | 5% | 1 |
| | | Skipped | 1 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 31. While deployed, how frequently does your unit rehearse trauma resuscitations? | Weekly | 52% | 11 |
| | Monthly | 24% | 5 |
| | Quarterly | 5% | 1 |
| | Other | 19% | 4 |
| | | Skipped | 1 |
| 32. While deployed, how frequently does your unit rehearse mass casualty response? | Weekly | 10% | 2 |
| | Monthly | 48% | 10 |
| | Quarterly | 29% | 6 |
| | Other | 14% | 3 |
| | | Skipped | 1 |
| 33. Does your unit have a patient identification process for MASCALs? | Yes | 100% | 21 |
| | No | | |
| | | Skipped | 1 |
| 34. Do you have a rehearsed Triage process with an identified Triage Officer? | Yes | 100% | 21 |
| | No | | |
| | | Skipped | 1 |
| 35. Do you have Commander's Critical Information Reporting Requirements? | Yes | 71% | 115 |
| | No | 14% | 3 |
| | Unsure | 14% | 3 |
| | | Skipped | 1 |
| 36. Do you have a casualty weapons clearing process? | Yes | 95% | 20 |
| | No | 5% | 1 |
| | | Skipped | 1 |
| 37. Do you have a weapons storage and clearance process to render a casualty safe (including search process)? | Yes | 95% | 20 |
| | No | 5% | 1 |
| | | Skipped | 1 |
| 38. Do you have K9-specific supplies available? | Yes | 76% | 16 |
| | No | 19% | 4 |
| | Unsure | 5% | 1 |
| | | Skipped | 1 |
| 39. Have you managed a MWD casualty in the last 6 months? | Yes | 20% | 4 |
| | No | 75% | 15 |
| | Unsure | 5% | 1 |
| | | Skipped | 1 |
| 40. Is there a Veterinarian immediately available at your location? | Yes | 24% | 5 |
| | No | 71% | 15 |
| | Unsure | 5% | 1 |
| | | Skipped | 1 |
| 41. Do you know how to contact a Veterinarian for immediate consultation? | Yes | 90% | 19 |
| | No | 10% | 2 |
| | | Skipped | 1 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 42. How far away is the nearest Vet? | <1 hour | 38% | 8 |
| | 1-2 hours | 33% | 7 |
| | 2-3 hours | 5% | 1 |
| | 3-4 hours | 10% | 2 |
| | >4 hours | 14% | 3 |
| | | Skipped | 1 |
| 43. Are you receiving medical supplies and equipment as requested? | Yes | 70% | 14 |
| | No | 30% | 6 |
| | | Skipped | 2 |
| 44. Does your unit/team/MTF have an emergency resupply system? | Yes | 60% | 12 |
| | No | 20% | 4 |
| | Unsure | 20% | 4 |
| | | Skipped | 2 |
| 45. What system is being used to order class VIII? | DMLS | 10% | 2 |
| | DCAM | 35% | 7 |
| | Excel/Email | 25% | 5 |
| | Other | 30% | 6 |
| | | Skipped | 2 |
| 46. Do you have junctional tourniquets available in the resuscitation area? | Yes | 75% | 15 |
| | No | 25% | 5 |
| | | Skipped | 2 |
| 47. Which junctional tourniquets does your unit have? | SAM JT | 73% | 11 |
| | JETT | 40% | 6 |
| | CRoC | 13% | 2 |
| | Improvised JT | 7% | 1 |
| | AAJT | 20% | 3 |
| | Unsure | 7% | 1 |
| | | Skipped | 7 |
| 48. Do you have a detainee / EPW SOP? | Yes | 45% | 9 |
| | No | 40% | 8 |
| | Unsure | 15% | 3 |
| | | Skipped | 2 |
| 49. Do you have a MASCAL SOP? | Yes | 95% | 19 |
| | No | | |
| | Unsure | 5% | 1 |
| | | Skipped | 2 |
| 50. Do you have a copy of the MEDROE? | Yes | 90% | 18 |
| | No | 10% | 2 |
| | | Skipped | 2 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 51. Do you have a controlled substance SOP? | Yes | 95% | 19 |
| | No | 5% | 1 |
| | | Skipped | 2 |
| 52. Do you have a process or SOP for the management of amputated limbs? | Yes | 60% | 12 |
| | No | 15% | 3 |
| | Unsure | 25% | 5 |
| | | Skipped | 2 |
| 53. Do you have a human remains SOP? | Yes | 70% | 14 |
| | No | 10% | 2 |
| | Unsure | 20% | 4 |
| | | Skipped | 2 |
| 54. Do you have a mortuary affairs POC identified? | Yes | 90% | 18 |
| | No | 10% | 2 |
| | | Skipped | 2 |
| 55. Do you have linguists available? | Yes | 90% | 18 |
| | No | 5% | 1 |
| | Sometimes | 5% | 1 |
| | | Skipped | 2 |
| 56. Do you have TXA readily available in the resuscitation area? | Yes | 95% | 19 |
| | No | 5% | 1 |
| | | Skipped | 2 |
| 57. Do you have TXA in the Operating Room? | Yes | 95% | 19 |
| | No | 5% | 1 |
| | | Skipped | 2 |
| 58. Does your unit/team/MTF: | | | |
| Maintain a patient log? | Yes | 100% | 19 |
| | No | | 0 |
| Use the CENTCOM naming policy for patients with unknown names? | Yes | 89% | 17 |
| | No | | 0 |
| | Unknown | 11% | 2 |
| Ensure that TCCC cards are retrieved from the transport teams? | Yes | 84% | 16 |
| | No | 5% | 1 |
| | N/A | 11% | 2 |
| Utilize the standard JTS patient log? | Yes | 63% | 12 |
| | No | 5% | 1 |
| | Unknown | 32% | 6 |
| Have a document scanner that works? | Yes | 58% | 11 |
| | No | 5% | 1 |
| | Unknown | 26% | 5 |
| | N/A | 11% | 2 |
| | Yes | 58% | 11 |

| | | | |
|---|---|---|---|
| Have reliable internet access? | No | 37% | 7 |
| | Unknown | 5% | 1 |
| | | Skipped | 3 |
| **Results for OFS and OIR** | | **Percent** | **Number** |
| 59. Do the clinicians in your unit have TMDS access? | Yes | 63% | 12 |
| | No | 26% | 5 |
| | No internet | 5% | 1 |
| | Unsure | 5% | 1 |
| | | Skipped | 3 |
| 60. Which blood products does your unit carry? (check all that apply) | LTOWB | 58% | 11 |
| | RBC | 100% | 19 |
| | FFP | 100% | 19 |
| | Platelets | 52% | 10 |
| | Cryo | 58% | 11 |
| | Freeze-dried plasma | 11% | 2 |
| | | Skipped | 3 |
| 61. Is the refrigeration capability adequate? | Yes | 100% | 19 |
| | No | | |
| | | Skipped | 3 |
| 62. Is FFP thawing available? | Yes | 95% | 18 |
| | No | 5% | 1 |
| | | Skipped | 3 |
| 63. Does your unit have the capability (training and equipment) to draw fresh whole blood? | Yes | 95% | 18 |
| | No | 5% | 1 |
| | | Skipped | 3 |
| 64. Does your unit perform hands-on training for fresh whole blood drawing and administration? | Yes | 95% | 18 |
| | No | 5% | 1 |
| | | Skipped | 3 |
| 65. Do you have a prescreened donor pool? | Yes | 79% | 15 |
| | No | 21% | 4 |
| | | Skipped | 3 |
| 66. Do you have a procedure for donors who have not been prescreened? | Yes | 79% | 15 |
| | No | 21% | 4 |
| | | Skipped | 3 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 67. Select which personnel are used to draw blood for a fresh whole blood drive: | Medics from our unit | 84% | 16 |
| | Medics from outside our unit | 47% | 9 |
| | Nurses from our unit | 53% | 10 |
| | Nurses from outside our unit | 21% | 4 |
| | Lab personnel | 47% | 9 |
| | Medical personnel from different units on the base/FOB | 37% | 7 |
| | Other | 16% | 3 |
| | | Skipped | 3 |
| 68. Have you ever had a shortage of blood collection bags? | Yes | 11% | 2 |
| | No | 79% | 15 |
| | N/A | 11% | 2 |
| | | Skipped | 3 |
| 69. Does your team utilize auto-transfusion of shed blood from the pleural cavity? | Yes | 37% | 7 |
| | No | 63% | 12 |
| | | Skipped | 3 |
| 70. How many surgical teams (surgeon, anesthesia, RN) does your unit have / how many trauma OR beds can be run at one time? | 1 | 37% | 7 |
| | 2 | 32% | 6 |
| | 3 | 21% | 4 |
| | 4 | 5% | 1 |
| | 5 or more | 5% | 1 |
| | | Skipped | 3 |
| 71. Number of general surgeons (or general surgery sub-specialists) on your team? | 1 | 37% | 7 |
| | 2 | 26% | 5 |
| | 3 | 37% | 7 |
| | | Skipped | 3 |
| 72. Number of orthopedic surgeons (or ortho sub-specialists) on your team? | 0 | 16% | 3 |
| | 1 | 74% | 14 |
| | 2 | 11% | 2 |
| | | Skipped | 3 |
| 73. Do you have a Neurosurgeon? | Yes | 21% | 4 |
| | No | 79% | 15 |
| | | Skipped | 3 |
| 74. Do you have an Ophthalmologist? | Yes | 11% | 2 |
| | No | 89% | 17 |
| | | Skipped | 3 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 75. How many ED Physicians are in your units/team/MTF? | 0 | 37% | 7 |
| | 1 | 37% | 7 |
| | 2 | 11% | 2 |
| | 3 | 11% | 2 |
| | 4 | 5% | 1 |
| | | Skipped | 3 |
| 76. In terms of additional personnel, how many of the following do you have? | | | |
| ED Nurse | 0 | 11% | 18 |
| | 1 | 39% | 18 |
| | 2 | 17% | 15 |
| | 3 | 11% | 19 |
| | 4 | 17% | 15 |
| | 5 or more | 6% | 16 |
| ICU Nurse | 0 | 11% | 2 |
| | 1 | 39% | 7 |
| | 2 | 11% | 2 |
| | 3 | 17% | 3 |
| | 4 | 11% | 2 |
| | 5 or more | 2 | 2 |
| ICW Nurse | 0 | 67% | 10 |
| | 1 | 7% | 1 |
| | 2 | 20% | 3 |
| | 3 | 0% | 0 |
| | 4 | 0% | 0 |
| | 5 or more | 7% | 1 |
| OR technicians | 0 | 33% | 0 |
| | 1 | 27% | 7 |
| | 2 | 13% | 4 |
| | 3 | 0% | 4 |
| | 4 | 0% | 2 |
| | 5 or more | 27% | 2 |
| Other technicians | 0 | 0% | 5 |
| | 1 | 27% | 4 |
| | 2 | 13% | 2 |
| | 3 | 21% | 0 |
| | 4 | 0% | 0 |
| | 5 or more | 27% | 4 |
| Admin | 0 | 6% | 1 |
| | 1 | 56% | 9 |
| | 2 | 6% | 1 |
| | 3 | 13% | 2 |

| | | | |
|---|---|---|---|
| | 4 | 0% | 0 |
| | 5 or more | 19% | 3 |
| | | Skipped | 3 |
| 77. Did your team attend any pre-deployment training as a unit within 6 months of deploying? (ATTD, NTTC, C-STARS, JFTMC, etc) | Yes | 79% | 15 |
| | No | 21% | 4 |
| | | Skipped | 3 |
| 78. For each of your surgeons (including specialists); please indicate which training courses they attended: | | | |
| ATLS | Yes | 87% | 40 |
| | No | 13% | 6 |
| C-STARS | Yes | 8% | 3 |
| | No | 32% | 12 |
| | N/A (Not USAF) | 59% | 22 |
| NTTC | Yes | 6% | 2 |
| | No | 54% | 19 |
| | N/A (Not USN) | 40% | 14 |
| ATTD | Yes | 16% | 6 |
| | No | 58% | 22 |
| | N/A (Not USA) | 26% | 10 |
| EWSC | Yes | 50% | 20 |
| | No | 50% | 20 |
| ASSET | Yes | 54% | 20 |
| | No | 46% | 17 |
| REBOA | Yes | 60% | 21 |
| | No | 40% | 14 |
| 79. Do you have a JTS Liaison? | Yes | 63% | 12 |
| | No | 37% | 7 |
| | | Skipped | 3 |
| 80. How often does your team perform: | | | |
| Trauma resuscitation rehearsals? | Weekly | 42% | 8 |
| | Bi-weekly | 32% | 6 |
| | Monthly | 21% | 4 |
| | Quarterly | | 0 |
| | Other | 5% | 5 |
| Code blue rehearsals? | Weekly | 12% | 2 |
| | Bi-weekly | 6% | 1 |
| | Monthly | 30% | 5 |
| | Quarterly | 24% | 4 |
| | Other | 30% | 5 |
| FWB drive rehearsals? | Weekly | | 0 |
| | Bi-weekly | 5% | 1 |
| | Monthly | 68% | 13 |
| | Quarterly | 11% | 2 |

| | | | |
|---|---|---|---|
| | Other | 16% | 3 |
| | | Skipped | 3 |
| 81. Do you have a printed or electronic copy of the JTS CPGs readily accessible? | Yes | 100% | 19 |
| | No | | |
| | | Skipped | 3 |
| 82. Do you have a sterilization system? | Yes | 89% | 17 |
| | No | 11% | 2 |
| | | Skipped | 3 |
| 83. List the emergency supplies your team has for pediatric patients? | Broselow Tape | 100% | 19 |
| | O2 mask | 95% | 18 |
| | Foley | 78% | 14 |
| | Laryngoscope blades 1-3 | 94% | 17 |
| | ETT 4-6 French | 94% | 17 |
| | IO catheters | 94% | 17 |
| | BP cuffs | 89% | 17 |
| | Chest tubes 16-20 French | 65% | 11 |
| | | Skipped | 3 |
| 84. Which of the following does your unit/team/MTF have to manage elevated ICPs? | 3% saline | 100% | 19 |
| | Mannitol | 95% | 18 |
| | ICP monitor | 11% | 2 |
| | EVD | 21% | 4 |
| | Other | 16% | 3 |
| | | Skipped | 3 |
| 85. Which of the following does your unit/team/MTF have to manage burn patients? | Silverlon dressings | 44% | 8 |
| | Silvadene cream | 89% | 16 |
| | Sulfamylon cream | 39% | 7 |
| | Sulfamylon solution | 17% | 3 |
| | Other | 22% | 4 |
| | | Skipped | 4 |
| 86. Does your unit have the JTS Burn Resuscitation Flowsheet readily available? | Yes | 89% | 17 |
| | No | 11% | 2 |
| | | Skipped | 3 |
| 87. Which patient warming devices does you unit/team/MTF use? (Select all that apply) | HPMK | 84% | 16 |
| | Bair Hugger | 96% | 18 |
| | Warmed blankets | 63% | 12 |
| | Other | 16% | 3 |
| | | Skipped | 3 |
| 88. Does your unit conduct or participate in CPG-based educational training? | Yes | 100% | 19 |
| | No | | |
| | | Skipped | 3 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 89. Approximately how many trauma patients is your team/unit/MTF seeing in a week? | None | 16% | 3 |
| | <5 | 68% | 13 |
| | 5-10 | 16% | 3 |
| | | Skipped | 3 |
| 90. How many holding beds does your unit/team/MTF have? | None | 26% | 5 |
| | 1 | 5% | 1 |
| | 2 | 32% | 6 |
| | 3 | 5% | 1 |
| | 4 to 5 | 5% | 1 |
| | 6 to 10 | 5% | 1 |
| | >10 | 21% | 4 |
| | | Skipped | 3 |
| 91. How much time will your team typically hold a trauma patient? | <1 hour | 21% | 4 |
| | 1-2 hours | 26% | 5 |
| | 2-3 hours | 11% | 2 |
| | 3-4 hours | | 0 |
| | 4-5 hours | 5% | 1 |
| | 6-12 hours | 11% | 2 |
| | 12-24 hours | | 0 |
| | >24 hours | 26% | 5 |
| | | Skipped | 3 |
| Damage control procedures | | | |
| 92. Thoracotomy | Surgeon trained | 100% | 19 |
| | Finochietto retractor | 89% | 17 |
| | Lebsche knife | 95% | 18 |
| | Internal defibrillator paddles tested within 30 days | 42% | 8 |
| | Chest tubes (adequate supply) | 100% | 19 |
| | Pleurevac (adequate supply) | 89% | 17 |
| | GIA staplers for tractotomy (white loads) | 95% | 18 |
| | | Skipped | 3 |
| 93. Trauma laparotomy | Surgeon trained | 100% | 19 |
| | Suction | 100% | 19 |
| | Abdominal retractor (Balfour) | 100% | 19 |
| | Table mounted retractor | 47% | 9 |
| | Adequate supply of lap sponges | 100% | 19 |
| | 0-Chromic on a blunt needle | 95% | 18 |
| | Hemostatic dressings (please list which types) | 84% | 16 |
| | Electrocautery | 100% | 19 |
| | | Skipped | 3 |

| Results for OFS and OIR | | Percent | Number |
|---|---|---|---|
| 94. Vascular shunting | Surgeon trained | 95% | 18 |
| | Suction | 100% | 19 |
| | Vascular instrument set | 84% | 16 |
| | Vascular shunts (please list types) | 95% | 18 |
| | Heparin | 95% | 18 |
| | Thrombectomy catheters | 89% | 17 |
| | | Skipped | 3 |
| 95. Fasciotomy | Surgeon trained | 100% | 19 |
| | Surgeon performed no fasciotomies in the last year | 16% | 3 |
| | Surgeon performed 1-2 fasciotomies in the last year | 21% | 4 |
| | Surgeon performed 3 or more fasciotomies in the last year | 58% | 11 |
| | | Skipped | 3 |
| 96. External fixation | Surgeon trained | 100% | 19 |
| | Adequate supply of hardware | 89% | 17 |
| | | Skipped | 3 |
| 97. Surgical airway | Surgeon trained | 100% | 19 |
| | Adequate supply of tracheostomy tubes | 89% | 17 |
| | | Skipped | 3 |
| 98. Cardiac decompression and repair | Surgeon trained | 95% | 18 |
| | Sternal saw | 42% | 8 |
| | 2-0 Prolene CT-1 or similar non-cutting | 84% | 16 |
| | 3-0 Prolene CT-1 or similar non-cutting | 84% | 16 |
| | | Skipped | 3 |
| 99. Craniotomy | Surgeon trained | 74% | 10 |
| | Codman drill kit | 53% | 10 |
| | Hudson brace | 26% | 5 |
| | Gigli saw passer | 79% | 15 |
| | Gigli saw handles | 84% | 16 |
| | Bipolar cautery | 68% | 13 |
| | Electric drill with cranial perforated bit | 37% | 7 |
| | Leksell rongeur | 21% | 4 |
| | Penfield instrument | 37% | 7 |
| | | Skipped | 3 |

| | | | |
|---|---|---|---|
| 100. REBOA | Surgeon trained prior to arriving to theater | 74% | 14 |
| | Surgeon trained and certified by OIR / OFS Training Program | 58% | 11 |
| | Supplies available | 84% | 16 |
| | | Skipped | 3 |

~ END ~