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

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14. ABSTRACT  This observational study will be devoted to the analysis of existing (retrospective) data as noted in detail above. The data used for this study will be extracted from the Joint Trauma System (JTS) R2 database, which has been in place since 2008 and allows data collection at levels of medical care that previously did not have full trauma registry capabilities in Operation Enduring Freedom (OEF), Operation Iraqi Freedom (OIF), and Operation New Dawn (OND).

Aim 1: A retrospective review of all available data in the R2 Registry (n = approximately 15,000 records) will be conducted to evaluate combat casualty care using descriptive statistical analysis and modeling techniques.

Aim 2: Identify the ideal provider training and competency assessment, sustainment and evaluation for medical staff (physicians, nurses, other licensed professionals, medics) deployed to the R2 environment.

15. SUBJECT TERMS: Nothing listed

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**Introduction:**
There exists a continued lack of evidence about the impact of Role 2 (R2) medical resources in the combat theater. Although a R2 database has been in place since 2008, no systematic evaluation for these data has been conducted. Without analysis of this information, military planners and medical leaders will be unable to best allocate R2 resources in future operations. Furthermore, the clinical competencies required for each medical team member to function optimally in this environment have yet to be clearly defined or systematically supported across the Tri-Services.

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

**Accomplishments:**

**What were the major goals of the project?**

CY16 Goals – Develop R2R Performance Assessment Dashboard.

a. Create metrics to evaluate R2 outcomes and team performance.
b. Develop DoDTR report for near-real time feedback to deployed teams.
c. Track training and sustainment programs for R2 members.

CY17 Goal – Expand R2 database to all deployed units to OEF/OIF.

a. Obtain all identified data other than R2R.
b. Create repository within DoDTR for these data.
c. Conduct analysis and contrast by R2 unit and phase of conflict (entry, surge, and sustainment).

**What was accomplished under these goals?**

1) major activities:

- SOW was amended to include Tip-Top Pilot study at EVANS Community Hospital, Fort Carson, CO for deployed competency assessment
- Completed formal training to Implement Tip-Top pilot study at EVANS Community Hospital, Fort Carson, CO
- Collaboration with Fort Hood, Carl Darnall Army Medical Center as informal pilot site
- PI attended Remote Damage Control Resuscitation (THOR) Meeting in Norway June 2017 for training and competency for blood usage in an austere environment
- Collaboration with Southwest Texas Regional Advisory Council – CRADA in place. Utilize RemTORN network for evaluation of dashboard
- Site visit to CENTCOM in Tampa, FL; Medical Situational Awareness in Theater (MSAT) system is 80% solution for dash-board concept for situational awareness of medical assets in Theater
- Collaboration underway with Esri for ARC GIS geospatial mapping and real-time dashboard to achieve a 100% solution

2) Projects underway for detailed analysis of R2 dataset:

- Airway interventions
- Burn management
- Cardiac arrest resulting in resuscitative thoracotomy
- Crystalloid use
- Patients who died en route to R2 and at R2
3) Protocols:

1. **H-15-010** “Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Past, Present and Future” Amendment #6
   - Human Research Protection Officer (HRPO) assigned A-number: A-19116
   - Target number required/approved for clinical significance: 15,000
   - Type of submission: Local regulatory determination
   - Type of approval: Exempt local approval

2. **H-16-009** “Analysis of Medical Interventions in the Combat Environment Related to Deployed Hospital Care”
   - Human Research Protection Officer (HRPO) assigned A-number: A-19116.3
   - Target number for clinical significance: N/A
   - Type of submission: Local regulatory determination
   - Type of approval: Exempt local approval

   - Human Research Protection Officer (HRPO) assigned A-number: A-19116.2
   - Target number for clinical significance: 150 surveys
   - Type of submission: Local regulatory determination
   - Type of approval: Exempt local approval
   - Submitted SURVEY approval process (pending approval)

4. **H-16-023** “The R2 Experience: Comparing the JTS R2 Registry and Surgeon Case Logs from 2008 to 2017”
   - Human Research Protection Officer (HRPO) assigned A-number: A-19116.5
   - Target number for clinical significance: N/A
   - Type of submission: Local regulatory determination
   - Type of approval: Exempt local approval

5. **Old Dominion University** “Evaluation of Role 2 (R2) Medical Resources in the Afghanistan Combat Theater: Past, Present and Future
   - Human Research Protection Officer (HRPO) assigned A-number: A-19116.7b
   - Target number for clinical significance: N/A
   - Type of submission: Local regulatory determination
   - Type of approval: IRB

6. **Old Dominion University** “The Development of an Innovative Role 2 CPG-Based Trauma Knowledge-Assessment Instrument and Training Materials That Utilize Deliberative Practice and Mastery Training,”
• Human Research Protection Officer (HRPO) assigned A-number: A-19116.7a
• Target number for clinical significance: N/A
• Type of submission: Local regulatory determination
• Type of approval: IRB

7. H-17-017 Tip-Top Pilot Study (Fort Carson, CO)
• Human Research Protection Officer (HRPO) assigned A-number: A-19116
• Target number for clinical significance: N/A
• Type of submission: Local regulatory determination
• Type of approval: Not human subjects research; local approval

IVIR:
• Training Program Research and Traceability Matrix
  o This year significant progress was made on identifying and completing data fields for civilian course offerings that may be leveraged to provide training for our providers. Challenges were still encountered in obtaining course materials and course information from Service training sites and centers. However, traction towards the end of the year was made after presentation of preliminary findings at the MHSRS conference on 27 August 2017.
  o Eleven parent categories were identified for the training program traceability matrix. These were as follows; General Course Information, Course Details, Course Content, Instructional Methodologies, Course Type, Course Availability, Assessment Criteria, Requirements, Funding, Alignment with Clinical Practice Guidelines (CPGs), and Alignment with Tactical Combat Casualty Care (TC3) Guidelines. From these 11 parent categories, subcategories were then generated to capture the appropriate data elements of interest. 40 independent subcategories were identified. The following below outlines the matrix categories and subcategories utilized for the program and is inclusive of input from the PI and Co-Investigators.
  o Training Program Research and Traceability Matrix have been requested by and provided to: Committee for Surgery in Combat Casualty Care; Committee for Tactical Combat Casualty Care; Defense Medical Readiness Training Institute; Knowledge, Skills and Attributes (KSA) Working Group; Army Trauma Training Center

VMASC:
• Received initial IRB and HRPO Approval for the following protocols:
• Collecting and developing an organization system for all currently accumulated educational content submissions and incorporating new materials
• Continue to refine computer game based system design and identified edits needed for incoming computer programmer to correct or add to system
• Meeting with the Director of Nursing for the Military Sealift Command, Hospital Ship, COMFORT to evaluate the Role 2 core trauma patient care content, with possible training, testing, and use on an upcoming fleet exercise
Hosted WEBEX to recruit SMEs; introduced the overall research program, the goals and objectives of our component of this large study.

Completing the bank of trauma test questions, answers, and CPG and references primarily for nursing but including all content received and will be coded as to complexity along with the core content.

**VNIP:**

- Initiated/scheduled on-site training at Miami Ryder Trauma Training Center for 2 NOV 2017
  - Preceptor and Train the Trainer Course
  - Will meet with SMEs to complete Austere Team Competency elements
- Supported publication of research outcomes in peer reviewed journals. VNIP lead faculty continues work with senior leadership to finalize further implementation plans within MTFs. VNIP efforts target communications channels such as the VNIP Newsletter and development of a User’s Manual for the transition framework.
- The Competency Based Training and Evaluation Program Development Plan establish the tasks and priorities for the coming months.
- On-site training conducted for Evans Army Community Hospital June 2017

**What opportunities for training and professional development has the project provided?**

Professional development activities included the following:

- **Local Conference Dissemination**
  - SURF 2017
- **National Conference Dissemination**
  - MHSRS 2017 x 2 presentations, 5 posters
  - AMSUS 2017 (accepted) x 1 lecture (1 hour)
  - TSNRP 2017 x 1 poster
  - SCCM 2017 x 1 poster
  - EAST 2017 x 1 presentation
  - EAST 2018 (accepted) x 1 presentation
  - SAGES 2018 (accepted) x 1 poster
  - Shoresh 2017 x 1 presentation
- **USAISR Dissemination**
  - Scientific Seminar 2017 x 3 presentations
- **International Conference Dissemination**
  - THOR/Norway 2017
  - CBIS/London 2017 (accepted) x 2 presentations, 3 posters

**How were the results disseminated to communities of interest?**

- SURF 2017
- MHSRS 2017
- TSNRP 2017
- Scientific Seminar 2017
- AMSUS 2017
- CBIS 2017
- EAST 2017
- THOR 2017
- SCCM 2017
- Shoresh 2017
- IMSH 2017

**What do you plan to do during the next reporting period to accomplish the goals?**
Continue moving forward with CY17 Goals – Expand R2 database to all deployed units to OEF/OIF.

- Obtain available data other than R2R.
  - We plan to request access to the Theater Medical Data Store (TMDS) to use source documents to improve quality of R2 Database and generate injury severity scores
- Create real-time dashboard for situational medical awareness
- Working with Joint Trauma System, South Texas Regional Advisory Council, National Trauma Institute, CENTCOM, Esri
- Conduct analysis and contrast by R2 unit and phase of conflict (entry, surge, and sustainment).
- Collaborate with Committee for Surgical CCC and SMEs to develop core training platforms and content for CCC
- Continue analysis of data to address US-UK mutual goals

CY18 Goal – Implement Tri-Service training and sustainment standard.

   a. Cross-walk all training programs for R2 team members.
   b. Develop metrics for evaluating skills and knowledge retention.

**Impact**

What was the impact on the development of the principal discipline(s) of the project?
Provision of the systematic review of all deployment related training provided to CoSCCC and DMRTI, to jump-start the Education and Training Sub-Committee efforts; also provided to CoTCCC and ATTD as requested.

What was the impact on other disciplines?
Nothing to Report

What was the impact on other disciplines?
Nothing to Report

What was the impact on technology transfer?
Nothing to Report

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

**Changes/Problems:**

Changes in approach and reasons for change: NA

Actual or anticipated problems or delays and actions or plans to resolve them: NA

Changes that had a significant impact on expenditures: NA

Significant changes in use or care of human subjects, vertebrate animals, biohazards, and/or select agents: NA

**PRODUCTS:**

Publications, conference papers, and presentations

  **Journal publications.**
  - A Review of Casualties Transported to Role 2 Medical Treatment Facilities in Afghanistan, *Journal of Military Medicine*, Russ Kotwal, et.al. (in review)
- En route critical care transfer from a Role 2 to a Role 3 Medical Treatment Facility in Afghanistan, *Critical Care Nursing*, Amanda Staudt, et.al. (accepted)
- Factors Associated with Trauma Patients Length of Stay at Role 2 Facilities in Afghanistan, October 2009 to September 2014, *Journal of Trauma* MHSRS Supplement, Amanda Staudt, et.al. (submitted)
- Analysis of Pediatric Trauma in the Combat Zone as a Needs Assessment to Inform Pre-Deployment Military Training, *Journal of Trauma* MHSRS Supplement, Patrick Reeves, et.al. (submitted)

**Books or other non-periodical, one-time publications:**
Nothing to Report

**Other publications, conference papers, and presentations.**
- Factors Associated with Trauma Patients Length of stay at Role 2 Facilities in Afghanistan, October 2009 to September 2014, SURF UTSA 2017, Podium Presentation
- Analysis of Pre-Hospital Trauma Transport From Point of Injury to Role 2 Medical Treatment Facilities in Afghanistan, SURF UTSA 2017, Podium Presentation
- Duration of time trauma eligible patients stayed at Role 2 facilities in Afghanistan, Tri-Service Nursing Research Program, Elliott City, Maryland, Poster Presentation
- Epidemiology and Outcomes of Patients Treated at Role 3 Medical Treatment Facilities in Afghanistan, MHSRS 2017, Poster Presentation
- Complications and outcomes of battle-injured patients treated in Role 3 Medical Treatment Facility intensive care units in Afghanistan, MHSRS 2017, Oral Presentations
- A Preliminary Review of the Orthopaedic Injuries and Procedures Performed at Role 2 Medical Treatment Facilities in Afghanistan, MHSRS 2017, Poster Presentation
- Characteristics of Iraqi Patients treated by a single surgeon at a Role 2 in Al Taqqadum, MHSRS 2017
- Analysis of Crystalloid Usage from Injury to Role 2 Facility Discharge during the Afghanistan Conflict, MHSRS 2017, Poster Presentation
- Duration of Time Trauma Eligible Patients Stayed at Role 2 Facilities in Afghanistan, MHSRS 2017, Poster Presentation
- A Role 2 Database Study of Combat Mortality in Afghanistan, AMSUS 2017, Oral Presentation
- Epidemiology and Outcomes of Patients Treated at Role 3 Medical Treatment Facilities in Afghanistan, Centre for Blast Injury at Imperial College London 2017, Poster/Oral Presentation (accepted)
- Evaluation of the Joint Trauma System Role 2 Registry in Afghanistan, Centre for Blast Injury at Imperial College London 2017, Poster/Oral Presentation (accepted)
- Epidemiology of Orthopaedic Injuries Treated at Role 2 Facilities in Afghanistan, Centre for Blast Injury at Imperial College London 2017, Poster Presentation (accepted)
- Association of Fresh Whole Blood and Survival at Role 2 Medical Treatment Facilities in Afghanistan, EAST 2017 Lake Buena Vista, Florida, Podium Presentation
- Traumatic cardiac arrest at Role 2 Medical Treatment Facilities in Afghanistan, 2008-2014, Society of Critical Care Medicine, San Antonio, TX, Podium Presentation
- Analysis of Pediatric Trauma in Combat Zone to Inform High Fidelity Simulation Pre-deployment Training, Society of Critical Care Medicine, San Antonio, TX, Podium Presentation
- Analysis of Injury Patterns in US and Israeli Militaries as a Strategic Predictor of Forward Surgical Care in Future Conflicts, Shores 2017, Podium Presentation
- Implementation of a Nursing Competency Assessment Program in an Emergency Department, TSNRP 2017, Poster Presentation
- Pediatric military simulation following epidemiologic needs assessment - An Interim Report, IMSH 2017, Podium Presentation
• Medical Management of Severe Traumatic Brain Injury in Afghanistan at Forward Deployed Surgical Units Demonstrates a Potential Knowledge or Utilization Gap in Patient Management, SAGES 2017 (accepted)

Website(s) or other Internet site(s): NA

Technologies or techniques: NA

Inventions, patent applications, and/or licenses: NA

Other Products: NA

Participants & Other Collaborating Organizations
What individuals have worked on the project?

• COL Elizabeth A. Mann-Salinas, PhD, RN; No change
• Vermont Nurses in Partnership (VNIP), Inc. (Susan Boyer); No change
• IVIR (Nadine Baez/Erin Honold); No change
• VMASC (Andi Parodi); No change
• Col Stacy A. Shackelford, MD; No change
• Tuan D. Le, MD, DrPH; No change
• Jennifer Trevino, MBA; No change
• Krystal Valdez-Delgado, BSN, RN; No change
• Nicole Caldwell, RN; No change
• COL Kirby Gross, MD; No change
• Col Jeff Bailey, MD; No change
• Brig Timothy Hodgetts, MD, No change
• Col Ian Lane, DDS; No change
• Surg Capt. Rory Rickard, MD; No change
• LTC (P) Kyle Remick, MD; No change
• COL John Oh, MD; No change
• David Cannon; No change
• Maj Avi Benov, IDF; No change
• COL Jennifer Gurney, MD; No change
• LTC Matt Borgman, MD; No change
• COL (Ret) Russ Kotwal, MD; No change
• CAPT Zsolt Stockinger, MD; No change
• Ben Antebi, PhD; No change
• CPT Patrick Reeves, MD; No change
• Amanda Staudt, PhD, MPH; No change
• LTC Christina Hahn, MD; No change
• Mithun Suresh, MD; No change
• MAJ Jessica Rivera, MD; No change
• MAJ (P) Daniel Stinner, MD; No Change
• James Blair, MD; No Change
• Joseph Wenke, PhD; No Change
• Col Michael Charlton, MD; No Change
• COL (Ret) John F. Kragh, MD; No Change
• COL Shawn Nessen, DO; No Change
• COL Andrew Cap, MD; No Change
Has there been a change in the active other support of the PD/PI(s) or senior/key personnel since the last reporting period?
Nothing to report

What other organizations were involved as partners?
United Kingdom, Royal Center for Defense Medicine
Israeli Defense Forces
South Texas Regional Advisory Council
National Trauma Institute

Special Reporting Requirements

Quad Chart:
See attached

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

W81XWH-15-2-0085
PI: COL Elizabeth Mann-Salinas
Sponsor: JPC-6

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

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

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

Goals/Milestones

CY15 Goal
☑ Initiate R2 analysis and conduct comprehensive review of training literature, individual experiences, and Tri-Service training resources.

CY16 Goals
Develop R2 Performance Assessment Dashboard:
☑ Assessed availability of Dashboards for use across the DoD

CY17 Goal
Expand R2 database to all deployed units of OEF/OIF
☑ Collaborating with STRAC to assist with expanding the database to deployed units

CY18 Goal
☐ Implement Tri-Service training and sustainment standard.

CY19 Goal
☐ Evaluate long term outcomes of patients treated at R2 facilities post.

Comments/Challenges/Issues/Concerns
- Updated SOW to reflect Tip-Top Pilot Study at EVANS Hospital

Budget Expenditure to Date
Projected Expenditure: 2,107,063
Actual Expenditure: $1,873,066