

2019 SOMSA Research Abstract Selection for Oral or Poster Presentation

ORAL ABSTRACTS

Military Prolonged Field Care and Survival in Iraq and Afghanistan

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Background: Prolonged field care (PFC) is field medical care applied beyond doctrinal planning timelines. In military settings, delayed evacuation challenges prehospital providers, but reliable data to guide practice are sparse. The objective of this study is to quantify interventions administered for traumatically injured casualties during PFC and identify resources needed.

Methods: This retrospective cohort study selected casualties with significant injuries (max AIS>2), documented prehospital care, who survived 4-72 hours of PFC or died en route to a surgical hospital in Iraq or Afghanistan 2007–2015. PFC survivors were compared with prehospital decedents on injury characteristics and prehospital care. To adjust for injury severity, PFC survivors were matched to prehospital decedents on mechanism and type of injury and body regions with severe injuries (AIS>3). Multi-level logistic modeling also adjusted for age, US military, shock, transport team, maximum AIS and ISS. P values <0.05 were significant.

Results: Of 3,222 patients identified, 691 (21%) died prehospital, 2,531 survived PFC. Of 804 deaths, 738 (92%) occurred within 24 hours. Median time to death was 1.2 hours (IQR=0.8,8.9). PFC survivors received significantly more

warming devices, intravenous fluids, sedation, mechanical ventilation, narcotics and antibiotics. Patients who died prehospital received significantly more intubations, tourniquets, intraosseous fluids and CPR. They also received more prehospital transfusions, pelvic binders and pressure dressings (NS). Although prehospital transfusions were rare (1%), 725 (23%) of study patients were transfused within 24 hours, including 91 MTs (>10 units RBCs). 815 (25%) of patients received advanced airways and 583 (18%) ventilator support. Survival after prehospital CPR was 1.3%.

Conclusions: PFC should target resources, technology and training to prevent death from hemorrhage. Resources to provide advanced airway and ventilator support are also needed in the PFC environment.

Prehospital Combat Pill Pack Administration in Iraq and Afghanistan: A Department of Defense Trauma Registry Analysis

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Background: The United States (U.S.) military utilizes combat pill packs to treat the combat wounded who are still able to fight. We compared characteristics of combat casualties receiving combat pill packs to those not undergoing this intervention.

Methods: This is a secondary analysis of Department of Defense Trauma Registry (DODTR) dataset from January 2007 to August 2016. We searched for all subjects with documented pill pack use or at least one drug from the pack (acetaminophen, meloxicam, moxifloxacin). We compared the characteristics of these subjects to those of casualties not receiving any of these interventions.

Results: Of 28222 subjects in the DODTR during the study period, 154 (0.5%) either had documentation of pill pack administration (n=17) or documentation of at least one pill pack drug (n=137). Recipient demographics and injury patterns were comparable to those of non-recipients with most recipients of male sex (98.1%) and sustaining injuries by explosives (61.7%). Composite injury scores were lower in recipients versus non-recipients (median 9 [4-16] versus 4 [1-9], p<0.001).

There were no significant differences with regards to amputation proportions (3.9% versus 6.7%, $p=0.195$) or tourniquet placement proportions (11.0%, versus 14.1%, $p=0.351$) compared to non-recipients. Recipients were more likely to receive subsequent parenteral analgesia than non-recipients (38.9% versus 26.8%, $p=0.001$). No pill pack recipients died.

Conclusions: Subjects receiving the combat pill pack were less severely injured compared to the rest of the population. The pill pack had very infrequent use within this population.

The Effects of Concussion History and Resilience on Positive Psychological Outcomes in Active Special Operations Forces (SOF) Combat and Combat Support Soldiers

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Preparing for the Unforeseeable. Validation of a Research-driven Hemorrhage Control Training Protocol in Norway

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Norwegian Emergency Medicine Systems' Training and Equipment for Mass-Casualty Events: A Multicenter, Cross-Sectional, Survey-Based Study

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The Role of NCO in Avoiding Heat-induced Adverse Health Effects of Military Recruits during Exercise

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In Vitro Evaluation of RSDL® Product For Efficacy To Select Dermal Toxic Chemical Compounds

Laura Cochrane, Director of Medical and Clinical Affairs, Emergent Biosolutions Inc., United Kingdom

The Effects of a Novel Checklist on Self-Efficacy for Rapid Sequence Intubation

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Movement Screening for Musculoskeletal Injury Risk: Utilization as a Surrogate for Impact Screening

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Description of Penetrating Trauma in Children by Age and Location: A National Trauma Database Review

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A Retrospective Review of the Respiratory Effects of Analgesic/Anxiolytic Agents Administered to Traumatically Injured Civilians in the Prehospital Setting

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Prolonged Field Care – The U.S. Air Force Pararescue Experience

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Field-Deployable 'Dry Component' Approach to Resuscitation for Hemorrhagic Shock

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Consensus-Based Recommendation for Oxygenation Targets in Critically Injured Patients

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Trends in Prehospital Analgesia Administration by US Forces from 2007 through 2016

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How Telemedicine Impacts Clinical Decision and Performance In Prolonged Field Care Scenarios: A Preliminary Review

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Augmented Ultrasound Intelligence Protocol for Detection of Pneumothorax

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Skills Retention of SWAT Operators Applying the Abdominal Aortic and Junctional Tourniquet

James Vretis DO, MSc, Medical Director, Center for Tactical Medicine, Carlsbad, TX

Deployment of Low Titer O-Positive Whole Blood in the Prehospital Environment

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First Responder Advanced Life Support Improves Outcomes in the Helicopter Transported Trauma Patient

David A Wampler PhD, LP, FAEMS, The University of Texas Health Science Center at San Antonio; Tasia Long MHS, Southwest Texas Regional Advisory Council; Randall Schaefer MSN, RN, ACNS-BC, CEN, Southwest Texas Regional Advisory Council; Rena Summers BA, Southwest Texas Regional Advisory Council; COL Brian Eastridge MD, FACS, The University of Texas Health Science Center at San Antonio

Safety Analysis of a New Generation Freeze-Dried Plasma Product: Report of a Completed Dose-Escalation, Phase 1 Clinical Trial

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POSTER PRESENTATIONS

Evaluating the Teaching Method of Instructing Military SOF Medics in Ultrasonography to Diagnose Optic Nerve Sheath Diameter (ONSD) for the Acute Assessment of ICP in the Setting of TBI

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Background: Point of Care measurement of optic nerve sheath diameter can be used to correlate acute TBI with raised intracranial pressure (ICP) in austere and prolonged field care environments. The aim of our study is to evaluate the feasibility of teaching ocular ultrasonography to special operations medics for the purpose of identifying TBI with ICP in an acceptable amount of time and given limited required teaching resources.

Methods: We will assess the traditional teaching model of cadavers and live patients with some new static models for medics to correctly identify the accepted less than 5 mm cut-off. The study will utilize special operations senior 18D/68W1 attending the Mayo Austere Medicine course. Assessment will involve the ability to find the optic nerve sheath and perform the required 3 point measurement 3 mm behind the globe by operating a 7.5 MHz linear ultrasound probe on either a Phillips Lumify or Sonosite Handheld. Given multiple patient models and types both in didactic and scenario settings the medics will operate the ultrasound and identify the appropriate landmarks and measure the optic nerve sheath. A five-question post course test will act as a check on learning and will help to add metrics to our teaching method and feasibility study. Multiple courses and medics will be utilized to refine our data points over the next year.

Results: Our previous course with the single question of identifying <5mm acceptable diameter of the ONSD was posed to 23 providers, nurses and medics from Special Operations Units.

RESULTS			
SELF REPORTED CONFIDENCE IN POCUS			
N=41	BASELINE	POST TRAINING	P value
COMFORTABLE PERFORMING (%)	22	78	<0.001
COMFORTABLE INTERPRETING (%)	12	75	<0.001
Comfortable= 4 or 5 on 5 point Likert scale			
WRITTEN & MULTIPLE CHOICE EVALUATION			
N=41	Pre-Test (% correct)	Post-Test (% correct)	P value
Acquisition (probe)	52	81	<0.001
Interpretation (artifact)	71	95	0.002
Interpretation	68	87	0.21
Application	71	98	0.001
EXPERT OBSERVATION CHECKLIST			
Appropriate probe selection			
Appropriate depth			
Appropriate gain adjustment			
Appropriate probe handling			
Optic nerve identification			
Appropriate use of calipers			
Appropriate technique for ONSD			
(cross sectional diameter 3mm posterior to globe)			
<1 min. for single measurement			
EXPERT OBSERVER COMMENTS:			
'All participants were able to locate optic nerve'			
'ONSD measurement were variable'			

Conclusion/Discussion: Ultrasound represents the ideal portable assessment device for austere medicine to help SOF medics quantify the need for immediate evacuation and treatment versus serial neurological exams in the acute TBI patient.

Cognitive Effects of Fresh Whole Blood Donation in Special Operations Aviation

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The current array of combat forces often extends patient movement times past the previously established Department of Defense standard of the Golden Hour. With limited surgical capability to perform Damage Control Surgery, several SOF units have focused on Damage Control Resuscitation, including employing a walking blood bank of Warm Fresh Whole Blood. Currently there is very little data that look at the potential cognitive effects of donating 450 milliliters of blood as part of a walking blood bank. However, while the ability to donate 450 milliliters of blood increases blood product availability, the potential cognitive decline following blood donation of greater than 200 milliliters may pose additional risk to forward deployed forces. The 75th Ranger Regiment has

established a low O-titer blood donation program to increase the availability of Warm Fresh Whole Blood as part of Damage Control Resuscitation in austere environments.

As a dedicated precision rotary-wing support to Special Operations, including casualty evacuation (CASEVAC) missions, the 160th Special Operations Aviation Regiment has also developed a low O-titer blood program. Army Regulation 40-8 restricts performance of aviation crew member duties following the donation of greater than 200 milliliters of blood for a period of at least 72 hours. Using the Trail Making Test Part A and B, this study will assess the cognitive effects of blood donation of 200-450 milliliters on aviation crew members. It will provide valuable insight on the cognitive affects that may impact safe execution of aviation crew responsibilities during combat operations. 73 volunteers from the 160th SOAR were administered the Trail Making Test parts A and B, donated 1 unit of Fresh Whole Blood, were administered a second version of the Trail Making Test parts A and B, and then a third version of the Trail Making Test part A and B at 72 hours.

There was no statistically significant difference in times to completion of the Trail Making Test after donating blood or at 72 hours when compared to normative values.

Injectable Dehydrated Human Amnion/Chorion Membrane (dHACM) in the Treatment of Knee Osteoarthritis

Kris J Alden MD, PhD, Hip, Knee, and Shoulder Reconstruction, Hinsdale Orthopaedic Associates, Hinsdale, IL

A Case Report SPECT Study and Theoretical Rationale for the Sequential Administration of Ibogaine and 5-MeO-DMT in the Treatment of a Military Veteran with Alcohol Use Disorder

Dr. Joseph Peter Barsuglia, Research Psychologist, The Mission Within, Oakland, CA

The Whole Blood Clotting Test (WBCT): A Simple Field Test for Diagnosis and Treatment of Snakebites in Austere Environments

Jordan Benjamin, Herpetologist, Snakebite Researcher, Paramedic (NRP), Founder and Executive Director of the Asclepius Snakebite Foundation, Seattle, WA; Jean-Philippe Chippaux MD, PhD, Director of Research Institut de Recherche pour le Développement / MERIT, Institut Pasteur / CRT, Paris, France

Wound Cooling Properties of an Antibacterial Burn Dressing

Bryony Board, Laboratory Scientist, Andrew Hoggarth, Head of R&D, Matthew Grist, MSci, PhD, Principal Scientist, Medtrade Products, Crewe, Cheshire, UK

Going Up Stream: A Case of Aeromonas Hydrophilia in a Healthy AD Male

John Bonnes DO, USA, MC and Jacob Shook DO, USA, MC, Ft. Hood, TX

Improved VO2 Max through Blood Flow Moderation (BFM)

William Ursprung, PhD Student, Texas A&M University, College Station, TX

Making Gains with Poland Syndrome

Capt Kate M Englert MD, Flight Surgeon, Operational Support Medicine, 353 SOSS, Kadena AB, Okinawa, Japan; Sgt Christopher Lents, Medic, 18D, 1st Special Forces Group (Airborne), Torii Station, Okinawa, Japan; LCDR Benjamin Chi MD, Orthopedic Surgeon, USN, US Naval Hospital Okinawa, Okinawa, Japan

Virtual Reality Trauma Simulation: An Immersive Method to Enhance Military Medical Personnel Training and Readiness

CPT Kyle Couperus MD, Emergency Medicine Physician, CPT Chad Gorbakkin MD, Emergency Medicine Physician, Assistant Program Director, LTC Carl Skinner MD, Chief, Department of Emergency Medicine, LTC Scott Young DO, Department of Emergency Medicine, Residency Program Director, CPT Robyn Essendrop MD, Emergency Medicine Resident, PGY-2: Department of Emergency Medicine, Madigan Army Medical Center, Joint Base Lewis McChord, Tacoma, WA

Pneumomediastinum Secondary to Blunt Chest Injury: Assessing for Hidden Injuries

CPT Joel Fahling MD, MAJ Christopher Bickett MD, MAJ Cameron Wolterstorff MD, Madigan Army Medical Center, Department of Emergency Medicine – Joint Base Lewis-McChord, WA

Prehospital Interventions Associated With the Need for Massive Transfusion in Pediatric Trauma Patients in Iraq and Afghanistan.

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Evaluation of Special Operations Clinical Training at an Academic Medical Center with Knowledge Assessment and Clinical Skills Confidence Survey

Daniel Grabo MD, FACS, Associate Professor of Surgery, Alison Wilson MD, FACS, Professor of Surgery, West Virginia University Critical Care and Trauma Institute, Morgantown, WV

Fluid Handling and Exudate Management Properties of an Antibacterial Burn Dressing

Matthew Grist MSci, PhD, Principal Scientist, Andrew Hoggarth, Head of R&D, Pvt Bryony Board, Laboratory Scientist, Medtrade Products, Crewe, Cheshire, UK

Evaluation of a "Tool-less" External Fixator: Application and Reduction times

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Infection Prevention of an Antibacterial Burn Dressing

Andrew Hoggarth, Head of R&D, Matthew Grist MSci, PhD, Principal Scientist, Pvt Bryony Board, Laboratory Scientist, Medtrade Products, Crewe, Cheshire, UK

Assessment of Self-Application Failure With Three Windlass Tourniquets

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Ketamine Use in OEF/OFS

LT Eric Leslie, LT Riley Hoyer, LT Michael Poppe, LT Eric Pittman, CDR Benjamin Walrath, CDR Brendon Drew Naval Medical Center, San Diego, CA

Medical Micro-Data Cloud on the Tactical Network

Carl Manemeit, Deputy Operational Telemedicine Lab, USA MRMC Telemedicine and Advanced Technology Research Center (TATRC), Fort Detrick, MD; Johnnie Johnson, US-ARMY RDECOM AMRDEC, Redstone Arsenal, AL; Capt Isaiah Bragg, USAF, Wright-Patterson AFB, Dayton, OH

Austere Critical Care in rural Africa and resource poor environments

Aebhric O'Kelly PhD(c) FAWM CCP-C, Executive Dean, College of Remote and Offshore Medicine Foundation Pretty Bay, Malta, EU

Patient Handoff from Emergency Medical System Staff to Emergency Department Staff: How Are We Doing?

Maj Joseph Maddry MD, Nicole Shults BS, Lauren K Reeves MsPH, Kimberly Medellin BSN, RN, Alejandra G Mora BS, Shelia C Savell PhD, RN, San Antonio Military Medical Center, San Antonio, TX

Epidemiology and Comparison of Role II+ Field Hospitals Supporting Mosul Operations

John Quinn MD, PhD, Prague Center for Global Health, Charles University; Waad Badran, University Hospital Mosul; Omer Ameer Asm Abd, University Hospital, Mosul; Allaf Haider Ibn Sina, Baghdad

Performance Characteristics of Fluid Warming Technology in Austere Environments

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Current State of Closed Loop Control Technology and Potential Implications for Future Operations

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Advancing Mechanical Ventilation through Simulation
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The Growth of the “Stop the Bleed” Campaign in Italy

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The Promise of Intranasal Scopolamine for the Rapid Relief of Depression

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Comparison of Commercial and Improved External Pelvic Compression Devices

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Tactical Emergency Medicine in the Context of a Community-Based Emergency Residency Program: A Five-Year Analysis

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Testing the REBOA Porcine Flow Model: Migration of Aortic Occlusion Balloons

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Development of a Ballistic Gelatin Manikin to Test Tourniquets

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Tourniquet Trial in Morbidly Obese Adults

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Austere Provider Training for Prolonged Field Care: Lessons Learned from Translational Research

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Case Study: Supplement Related Death of a Special Operator

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Metric Development for a Needle Chest Decompression Procedure: Assessment of Face, Content and Construct Validity

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Safety and Efficiency of a Novel Needle Management System for Wound Closure

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