

## 2022 SOMSA ABSTRACTS

### 2022 Scientific Assembly Research Award Winners and Presentations

#### POSTER RESEARCH AWARD

##### Pressure Points, A Lifesaving Practice Forsaken in Vain, Findings from the Pressure Points Study

MAJ Regina Pikman Gavriely, MD1,2; SSG Yotam Lior, MD PhD2; CPT Shaul Gelikas, MD MBA1; MAJ Shiran Levy, MD1,3; COL Avi Benov, MD MHA4,5; MAJ Alon Ahimor, MD1; MAJ Guy Avital, MD1,2

1. The Trauma and Combat Medicine Branch, Surgeon General's Headquarters, Israel Defense Forces, Ramat Gan, Israel
2. Division of Anesthesia, Intensive Care, and Pain Management, Tel-Aviv Medical Center and Sackler Faculty of Medicine, Tel Aviv University, Tel-Aviv, Israel
3. Department of Radiology, Hadassah Hebrew University Medical Center, Jerusalem, Israel
4. The Azrieli Faculty of Medicine, Bar-Ilan University, Safed, Israel
5. Israel Defense Forces, Northern Command Surgeon

**Background:** Junctional hemorrhage (from the junction between the limbs and torso) is a leading cause of preventable death on the battlefield (19.2% of lethal hemorrhages), and is unamenable by standard tourniquets, while junctional tourniquet application is difficult and time consuming. Pressure points maneuver, the practice of stopping or limiting major bleeding by manually compressing a major artery against a bony structure to stop blood flow distal to that point, is no longer recommended by the leading pre-hospital care guidelines, following a single study questioning its effectiveness. The current study re-addresses this issue, assessing the effectiveness of supraclavicular and femoral pressure points at stopping blood flow to the limb in elite combat soldiers. **Methods:** In this interim analysis of a prospective human volunteer study, twenty-four special operations forces medics applied the supraclavicular and femoral pressure points following brief instruction. Distal blood flow was measured using pulse wave Doppler ultrasound until complete cessation of blood flow and for an additional three minutes afterward. Time to complete blood flow cessation and cumulative time of blood flow absence within those minutes was recorded. **Results:** Nearly all participants (aged  $21.7 \pm 1.1$ ) successfully achieved complete arrest of distal blood flow using the supraclavicular (95.8%) and femoral (100%) pressure points within  $10.3 \pm 23.8$  and  $3.8 \pm 2.5$  seconds, respectively. Adequate pressure was maintained for  $178.3 \pm 5.1/180$  seconds in the femoral point and  $117.1 \pm 41.6/180$  seconds in the supraclavicular point. Conclusion These results demonstrate that under laboratory conditions following minimal instruction, soldiers could effectively stop or significantly decrease distal blood loss by applying two clinically relevant pressure points for a reasonable time period. This suggests that with appropriate training, this practice is

feasible and its re-introduction to pre-hospital trauma guidelines should be considered, mainly as a bridge for other measures to be applied while preserving precious blood in the first critical moments following injury.

#### PODIUM RESEARCH PRESENTATION AWARD

##### Hyperoxia Is Associated With a Greater Risk for Mortality in Critically Ill Traumatic Brain Injury Patients Than in Critically Ill Trauma Patients Without Brain Injury

David J. Douin, MD; Layne Dylla, MD, PhD; Erin L. Anderson, RN, University of Colorado School of Medicine, Aurora, CO, USA; John D. Rice, PhD; Conner L. Jackson, MS, Colorado School of Public Health, Aurora, CO, USA; Robert T. Neumann, MD, University of Colorado School of Medicine, Aurora, CO, USA; Col Vikhyat Bebarta, MD, University of Colorado School of Medicine Center for COMBAT Research, Aurora, CO, USA; and Colorado School of Public Health, Aurora, CO; MAJ Steven G. Schauer, DO, MS, US Air Force 59th Medical Wing, Office of the Chief Scientist, JBSA Lackland, TX, USA, and US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX, USA; Adit A. Ginde, MD, MPH, University of Colorado School of Medicine, Aurora, CO, USA; and Center for COMBAT Research, University of Colorado School of Medicine, Aurora, CO, USA; \*Drs. Douin and Dylla contributed equally to the work of this study.

**Background:** Both hypoxia and hyperoxia are associated with increased mortality among critically injured civilians and military personnel. However, the risks of hyperoxia in traumatic brain injury (TBI) patients relative to other critically ill trauma patients remain unknown. **Methods:** We performed a secondary analysis of a multicenter retrospective cohort study of 3,464 critically injured adult patients presenting to three regional trauma centers (two level I and one level II) between October 1, 2015, and June 30, 2018. The primary outcome was in-hospital mortality. Secondary outcomes included proportion of time spent in hyperoxia (defined as  $SpO_2 > 96\%$  or  $PaO_2 > 100\text{mmHg}$ ) and ventilator free days (VFD). **Results:** After adjusting for ICU length of stay and mechanical ventilation status, critically ill TBI patients spent a significantly greater amount of time in hyperoxia than their critically ill non-TBI counterparts (49.2% vs 44.0%;  $p < 0.001$ ). A total of 163/1524 patients (10.7%) died in the TBI group, and 101/1940 patients (5.2%) died in the non-TBI group. The risk for mortality was significantly higher for TBI patients with hyperoxia than non-TBI patients with hyperoxia. At any fixed  $SpO_2$  level, for both patients with and without TBI, the risk of mortality increased with increasing  $FiO_2$ . This trend was observed at all  $FiO_2$  and  $SpO_2$  levels but was more pronounced at lower  $FiO_2$

and higher SpO<sub>2</sub> values where a greater number of patient observations were obtained. Conclusion: Hyperoxia was more common and was associated with a greater risk for in-hospital mortality in critically ill TBI patients, compared to critically ill trauma patients without TBI. Prospective studies are needed to elucidate the mechanisms and clinical implications underlying these differences to inform oxygen-related clinical practice guidelines for military and civilian TBI patients.

## 2022 SCIENTIFIC ASSEMBLY RESEARCH PRESENTATIONS

### Internal Jugular Vein Dissection Diagnosed Using Bedside Ultrasonography

CPT Vanessa C. Hannick, MD (1); CPT Alexandra Palmer, MD (1); 2d LT Matthew Gaddy, NREMT-P; (2) 2LT Matt Brown, Medical Student; (3) CPT Adam Spanier, MD (1); MAJ Daniel B. Brillhart, MD (1); 1) Carl R. Darnall Army Medical Center, Fort Hood, TX 2) 212th, JBER, AK; 3) Uniformed Services University, Bethesda, MD

### Should Dalbavancin Replace Vancomycin in the Prolonged Casualty Care Setting?

2LT Cooper Barber, Medical Student (1); SSG Blake Wright, SO-ATP, NRP, FP-C, Flight Medic; (2) CPT Adam Spanier, Chief Resident, Emergency Medicine; (3) MAJ James Gragg, Attending Emergency Medicine Physician (3); 1. USUHS, Bethesda, MD; 2. Hunter AAF, Savannah, GA; 3. Carl R. Darnall Army Medical Center, Fort Hood, TX

### “AirSupport” Casualty Transport Pad Outperforms the Warrior Evacuation Litter Pad (WELP): Decreased Skin Surface Pressure at <50% of WELP Weight and 33% of WELP Size

Ashish Puzekar, PhD: Senior Scientist & Program Manager\*; Pablo Szein, MS: Senior Product Design Engineer\*; Jonathan Chambers, PhD: Product Development Engineer\*; \*InnoVital Systems (Calverton, MD); Amit Shah, MD: Chief Medical Officer, InnoVital Systems (Calverton, MD) & Senior Attending Physician, MedStar Emergency Physicians

### Next-Generation, Light-Guided “SureTube” Intubation: High Success by Novice Operators Using an Early Prototype System in a Cadaver Model

(1) Amit Shah, MD: Chief Medical Officer, InnoVital Systems (Calverton, MD) & Senior Attending Physician, MedStar Emergency Physicians; (2) Curt Kothera, PhD: Senior Scientist & Program Manager, InnoVital Systems (Calverton, MD)

### Expeditionary Fasciotomy and Aeromedical Evacuation from a Deployed Naval Ship

Lieutenant Commander Andrew J. Medenbach, DO, Emergency Medicine, US Navy, San Diego, CA; Lieutenant Commander Marissa A. Mayor, MD, General Surgeon, US Navy, Jacksonville, NC; Lieutenant Commander, Alexandre D. Nguyen, MD, Emergency Medicine, US Navy, San Diego, CA

### Designing Human Factors Into a Multi-Vent Chest Seal Dressing

Matthew Grist; Amy Connah; Andrew Hoggarth (Research & Development at Medtrade Products Ltd, Crewe, UK); Tim Berrow (Global Product & Business Development Manager at Medtrade Products Ltd, Crewe, UK)

### Efficacy of a Multi-Vent Chest Seal Dressing Under Different Clinical Conditions

Amy Connah; Matthew Grist; Andrew Hoggarth (Research & Development at Medtrade Products Ltd, Crewe, UK); Tim Berrow (Global Product & Business Development Manager at Medtrade Products Ltd, Crewe, UK)

### The Impact of Environmental Conditions on the Adhesion Properties of a Multi-Valve Vented Chest Seal Dressing

Andrew Hoggarth; Matthew Grist; Amy Connah (Research & Development at Medtrade Products Ltd, Crewe, UK); Tim Berrow (Global Product & Business Development Manager at Medtrade Products Ltd, Crewe, UK)

### Retrospective Review of Neuroendocrine Dysfunction among National Intrepid Center of Excellence (NICoE) Intensive Outpatient Program (IOP) Patients: Expanded Results of Preliminary Findings

ENS Bryson Hewins, MS, MSIII (1); LT Rachael Campbell, MD, PGY-2 (1,2); Dr. Sara Lippa, PhD, AI (1,2); Carol Moore, MA, AI (1); LCDR Kent Werner, MD, PhD, Director of Research Sleep Center WRNMMC (1,2,3); Dr. Kimbra Kenney, MD, Service Chief, Research Ops NICoE (1,2); 1. Uniformed Services University of the Health Sciences, Bethesda, MD; 2. National Intrepid Center of Excellence, Bethesda, MD; 3. Sleep Disorders Center, Walter Reed National Military Medical Center, Bethesda, MD

### An Innovative Civilian Research Model to Inform Combat-Relevant Prolonged Casualty Care

Chandni Patel, BPH1; Lina V. Mata, MD2; Baidwan Navneet, PhD2; COL (ret) Sean Keenan, MD3; Julia Dixon, MD, MPH4; Elmin Steyn, MBChB5; Hendrick J. Lategan, MBChB6; Shaheem de Vries MBChB, MPhil7; Adeloje Adeniji, MBChB, MMed8; Lesley Hodson, MBChB, MMed9; Suzan Mukonkole, MBChB MMed10; Jeanette Verster, MBChB, MMed11; MAJ Steven G. Schauer, DO, MSCR12; MAJ Andrew D. Fisher, MD, PA-C LP13; MAJ Michael D. April, MD, PhD, MSc14; Adit A. Ginde, MD MPH15; Col Vikhyat S. Bhabra, MD16; Nee-Kofi Mould-Millman, MD17.

Affiliations: 1. Professional Research Assistant. Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 2. Research Associate. Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 3. Assistant Director Prehospital, Trauma and Operational Strategy. CU Anschutz Center for COMBAT Research, University of Colorado, Aurora, CO, USA; 4. Assistant Professor, Emergency Medicine. Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 5. Head of Trauma, Tygerberg Hospital. Faculty, Department of Surgery, Stellenbosch University. Cape Town, Western Cape–South Africa; 6. Physician, Tygerberg Hospital. Faculty, Stellenbosch University Cape Town, Western Cape–South Africa; 7. Medical Director, Western Cape Government Health Emergency Medical Services, Cape Town, Western Cape–South Africa; 8. Physician, Ceres Hospital. Faculty, Stellenbosch University, Cape Town, Western Cape, South Africa; 9. Physician, Worcester Hospital. Faculty, Stellenbosch University, Cape Town, Western Cape, South Africa; 10. Physician, Khayelitsha Hospital. Faculty, Stellenbosch University, Cape Town, Western Cape, South Africa; 11. Head, Department of Forensic Pathology, Tygerberg Hospital and Stellenbosch University, Cape Town, Western Cape, South Africa; 12. Physician Scientist. US Army

Institute of Surgical Research, Fort Sam Houston, TX, USA; 13. Resident Physician, Department of Surgery, The University of New Mexico, Albuquerque, NM, USA; 14. Commander, 40th Forward Resuscitative Surgical Detachment, 627th Hospital Center, Fort Carson, CO, USA; 15. Professor and Vice Chair, Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 16. Professor, Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 17. Associate Professor, Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA

#### Non-Standard Evacuation Africa

Staff Sergeant Christopher Bryant, SOCAMS, ATP, Paramedic Special Operations Civil Affairs Medical Sergeant B Co, 91st CA BN (SO)(A), Fort Bragg, North Carolina

#### Ethics in Special Operations Medicine

Staff Sergeant Christopher Bryant, SOCM, ATP, Paramedic Special Operations Civil Affairs Medical Sergeant B Co 91st CA BN (SO) (A), Fort Bragg, North Carolina

#### A Case of Clinically Significant Hypotension Following TXA Administration

CPT Vanessa Hannick, MD, Faculty Emergency Physician; LTC Daniel Brillhart, MD, Ultrasound Fellowship Director & Faculty Emergency Physician, C.R. Darnall Army Medical Center, Ft Hood, TX; LCDR Austin Yoder, MD, Staff Emergency Physician, US Naval Hospital, Yokosuka, Japan; SFC Cyril Clayton, NATO SOCM NCOIC, International Special Training Centre, Baden-Württemberg, Germany; 2d Lt Matthew Gaddy, NREMT-P, 212th RQS, US Air Force, Anchorage, AK

#### Suicide Bombing Terrorism

\*Derrick Tin, MBBS Senior Fellow, BIDMC Disaster Medicine Fellowship, Department of Emergency Medicine, Beth Israel Deaconess Medical Center and Harvard Medical School; \*Corresponding Author Jordan Galehan, PhD, Assistant Professor of Criminology, Department of Behavioral Sciences Flagler College; Vesna Markovic, PhD, Professor and Chair Justice, Law and Public Safety Studies, Lewis University; Gregory R. Ciottone, MD, Director, BIDMC Disaster Medicine Fellowship, Department of Emergency Medicine, Beth Israel Deaconess Medical Center, Associate Professor, Harvard Medical School

#### A Technology to Define Traumatic Brain Injury to Assist With Operator Return to Duty Decision Making and to Optimise Training Prescription and Performance

Mr. Edmond Sorich, Director GLIA Diagnostics. Sydney NSW Australia; Mr Shane Acorn; Mr Daniel Pace INVICTA Prospects Group (AI Technology). Sydney NSW Australia. Directors and Co-founders. Former Australian Special Operations Personnel. Active Reservists.

#### Practice Variation in Tranexamic Acid Dosing Among Military Medics

CPT Evan Stern, MD, USA; (Resident); CPT Sophia Liu, MD, USA; (Staff Physician); LTC Dan Brillhart, MD, FACEP, USA; (Staff Physician) Department of Emergency Medicine, Carl R. Darnall Army Medical Center, Fort Hood, TX

#### Practice Variation in Tranexamic Acid Dosing Among Military Physicians and Advanced Practice Providers

CPT Evan Stern, MD, USA; (Resident); CPT Sophia Liu, MD, USA; (Staff Physician); LTC Dan Brillhart, MD, FACEP, USA; (Staff Physician) Department of Emergency Medicine, Carl R. Darnall Army Medical Center. Fort Hood, TX

#### A Large Animal Model Comparison of the LifeFlow Versus Pressure Bag Effects Whole Blood Coagulation

Fabiola Mancha, MS (1); Joseph K. Maddry, MD (1, 2, 3, 4); Steven G Schauer, DO, MS (1, 2, 3); (1) US Army Institute of Surgical Research, JBSA Fort Sam Houston, Texas, USA; (2) Brooke Army Medical Center, JBSA Fort Sam Houston, Texas, USA; (3) Department of Military and Emergency Medicine, Uniformed Services University of the Health Sciences, Bethesda, Maryland, USA; (4) 59th Medical Wing, JBSA Lackland, Texas, USA

#### Simulations of Blast Exposure on Military Personnel in Explosive Breaching Training Scenarios

George Medan; Staff Engineer Chris Ong; Staff Engineer Ryan Schindler; Staff Engineer Suthee Wiri, PhD, Principal Engineer, Applied Research Associates, Albuquerque, NM

#### Severe Hypophosphatemia and Tetany in a Special Operations Combat Dive Candidate

CPT Gerrit Davis, MD, PGY-2 Emergency Medicine Resident, Madigan Army Medical Center Emergency Medicine Residency Program, Joint Base Lewis-McChord, WA; CPT Joshua D. Evans, APA-C, DMO, FAWM, Physician Assistant, 2nd Battalion, 1st Special Forces Group (Airborne), Joint Base Lewis-McChord, WA; LTC Owen McGrane, MD, Department Chief and Attending Emergency Physician, Madigan Army Medical Center Department of Emergency Medicine, Joint Base Lewis-McChord, WA

#### Pressure Points—A Lifesaving Practice Forsaken in Vain, Findings from the Pressure Points Study

MAJ Regina Pikman Gavriely, MD1,2; SSG Yotam Lior, MD PhD2; CPT Shaul Gelikas, MD MBA1; MAJ Shiran Levy, MD1,3; COL Avi Benov, MD MHA4,5; MAJ Alon Ahimor, MD1; MAJ Guy Avital, MD1,2; 1. The Trauma and Combat Medicine Branch, Surgeon General's Headquarters, Israel Defense Forces, Ramat Gan, Israel; 2. Division of Anesthesia, Intensive Care, and Pain Management, Tel-Aviv Medical Center and Sackler Faculty of Medicine, Tel Aviv University, Tel-Aviv, Israel; 3. Department of Radiology, Hadassah Hebrew University Medical Center, Jerusalem, Israel; 4. The Azrieli Faculty of Medicine, Bar-Ilan University, Safed, Israel; 5. Israel Defense Forces, Northern Command Surgeon

#### Automated REBOA: Validation of the First FDA Cleared System in a Hemorrhage Model

Habib Frost, MD, CEO of Neurescue, Copenhagen, Denmark.

#### Comparison of Endotracheal Intubation Outcomes using Neuromuscular Blockade or Sedation Only in the Prehospital Setting

2LT Henry Melgarejo, MD Candidate, Uniformed Services University of the Health Sciences, Bethesda, MD; LCDR Paul J.D. Roszko, EM Physician, Director for Emergency Medical Services, Naval Medical Forces Atlantic Medical Director, HSCWINGLANT Emergency Medicine Physician, Navy

Medicine Readiness & Training Command Portsmouth, VA; Mr. Gregory J. Zarow, Analyst Combat Trauma Research Group-North, Walter Reed National Military Medical Center, Bethesda, MD

### Insufficient Sleep is Related to Poor Infantry Battle Drill Performance in Special Operations Soldiers

Janna Mantua, PhD, Sleep Research Scientist (Affiliation 1); MAJ Joseph D. Shevchik, DO, Battalion Surgeon (Affiliation 2); CPT Sidhartha Chaudhury, PhD, Research Psychologist (Affiliation 1); Hannah P. Eldringhoff, BS, Clinical Research Coordinator (Affiliation 1); Carolyn A. Mickelson, MPS, Clinical Research Coordinator (Affiliation 1); CPT Ashlee B. McKeon, PhD, Research Psychologist (Affiliation 1) Affiliation 1: Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD, USA. Affiliation 2: 75th Ranger Regiment, Ft. Benning, GA, USA

### Addressing Acoustic Blast Injuries in the Prolonged Casualty Care Environment

CPT Jessica Eker, MD, Emergency Medicine Resident; CPT Vanessa Hannick, MD, Faculty Emergency Physician; LTC Dan Brillhart, MD, Emergency Ultrasound Fellowship Director and Faculty Emergency Physician, Carl R. Darnall Army Medical Center Department of Emergency Medicine, Fort Hood, TX; 2LT Matthew Brown, NREMT-P, Medical Student, Uniformed Services University of the Health Sciences, Bethesda, MD SO2; Matt Devorin, SOTM, SEAL Team EIGHT, Virginia Beach, VA

### Ultrasound Training for Combat Medics: Lessons Learned from the Fort Hood Medical Simulation Training Center

CPT Jessica Eker, MD, Emergency Medicine Resident; CPT Chelsea Ausman, MD, Emergency Ultrasound Fellow; CPT Vanessa Hannick, MD, Faculty Emergency Physician; LTC Dan Brillhart, MD, Emergency Ultrasound Fellowship Director and Faculty Emergency Physician, Carl R. Darnall Army Medical Center Department of Emergency Medicine, Fort Hood, TX; 2LT Matthew Brown, NREMT-P, Medical Student, Uniformed Services University of the Health Sciences, Bethesda, MD SO2; Mitchell Zwade, SEAL, SOCM, NSW Team 8, Virginia Beach

### A Comparison of the Novel, Single-use i-view Video Laryngoscope Versus the Standard Durable Video Laryngoscope in the Emergency Department, A Preliminary Analysis

Jessica Mendez, BS-USAISR; Daniel Resnick-Ault, MD-UCD; Jill Bastman, BSN-UCD; Maj Brit Long, MD-BAMC; Lt Col Joseph K. Maddry, MD-USAISR; Maj William T. Davis, MD-BAMC; Col Vikhyat S. Bebartha, MD-UCD; MAJ Steven G. Schauer, DO, MSCR-USAISR

### Characterizing Pediatric Supermassive Transfusion and the Contributing Injury Patterns in the Combat Environment

John D. Hesling (Former Navy LCDR), BS, Medical Student University of Colorado School of Medicine; Aurora, CO; CPT Matthew W. Paulson, BA, Medical Student University of Colorado School of Medicine; Aurora, CO; MAJ Jerome T. McKay (USA; Retired), PhD, Program Manager, CU Anschutz Center for COMBAT Research Instructor of Emergency Medicine University of Colorado School of Medicine; Aurora, CO; Col Vikhyat S. Bebartha, MD, Director, CU Anschutz Center

for COMBAT Research Professor of Emergency Medicine and Pharmacology University of Colorado School of Medicine; Aurora, CO 59th Medical Wing, Science & Technology (59MDW S/T), JBSA-Lackland, TX; Brig Gen Kathleen Flarity, DNP, PhD, Deputy Director, CU Anschutz Center for COMBAT Research Associate Professor of Emergency Medicine University of Colorado School of Medicine; Aurora, CO; Mobilization Assistant to AMC Command Surgeon Headquarters, Air Mobility Command; Scott Air Force Base, IL; COL Sean Keenan (USA; Retired), MD, Assistant Director Prehospital, Trauma, and Operational Strategy, CU Anschutz Center for COMBAT Research University of Colorado School of Medicine; Aurora, CO; Joint Trauma System, Defense Health Agency; JBSA Fort Sam Houston, TX; Uniformed Services University of the Health Sciences; Bethesda, MD; MAJ Andrew D. Fisher, MD, MPAS, General Surgery Resident, Department of Surgery, University of New Mexico School of Medicine; Albuquerque, NM Medical Command, Texas Army National Guard; Austin, TX; COL Matthew A. Borgman, MD, Department of Pediatrics, Brooke Army Medical Center; JBSA Fort Sam Houston, TX; Uniformed Services University of the Health Sciences; Bethesda, MD; MAJ Michael D. April, MD, DPhil, MSc, Commander, 40th FRSD 627th Hospital Center, 1st Medical Brigade; Fort Carson, CO; Uniformed Services University of the Health Sciences; Bethesda, MD; MAJ Steven G. Schauer, DO, MS, Capability Area Manager, US Army Institute of Surgical Research (USAISR); JBSA Fort Sam Houston, TX; Department of Emergency Medicine, Brooke Army Medical Center; JBSA Fort Sam Houston, TX; Uniformed Services University of the Health Sciences; Bethesda, MD

### Creation of SMERFTM: A Small Volume Multifunctional Emergency Resuscitation Fluid—Filling an Unmet Need for Damage Control Resuscitation (DCR)

Jonathan S. Jahr, MD, PhD, Professor Emeritus of Anesthesiology, David Geffen School of Medicine at UCLA; Pedro Cabrales, PhD, Professor of Bioengineering, UC San Diego; Allen Rojhani, Medical Student, Drexel University College of Medicine; Hae Won Kim, PhD, Visiting Professor of Biochemistry, Brown University School of Medicine

### Resilience at the Tip of the Spear: Identifying the Mindfulness Prescription for Special Operations Forces

MAJ Kevin Butler and MAJ Frank Foss Army Special Forces Officers, Students at the Naval Postgraduate School, Monterey, CA

### Combating Lower-Limb Injury Risk Through Foot Strike and Gait Retraining in Active-Duty Service Members

Mulier, Lauren, SPT1; Mathews, Sara, DPT2; Ekstrand, Ilona, PTA2; Leugers, Kelly, DPT, OCS2; Gonnella, Maria, BS2,3; Reilly, Nicholas, PhD, ACSM-CEP2,3; Haltiwanger, Henry, DPT2,3; COL (Ret) Goss, Don, DPT, PhD, OCS, ATC1,2,3; 1. High Point University, High Point, NC 27268; 2. Womack Army Medical Center, Fort Bragg, NC 28310; 3. The Geneva Foundation, Tacoma, WA 98402

### Strategy to Avoid Excessive Oxygen (SAVE-O2) in Major Burn Patients: A Multicenter Cluster Randomized, Stepped Wedge Trial for Targeted Normoxia

Layne Dylla, MD, PhD1; David J. Douin, MD1; Erin L. Anderson, RN1; Jessica Cwik, BS1; Aimee Steinwand, BS1; MAJ Steven G. Schauer, DO, MS2,3,4; John D. Rice, PhD5; Conner Jackson, MS5; Alex Cheng, PhD6; Leopoldo Cancio, MD,

FACS7; Garret Britton, DO7; Elizabeth Dale, MD7; Arek J. Wiktor, MD1; MSGT Dario Rodriguez, RRT8; Col Vikhyat S. Bebart, MD1,3,9; Adit A. Ginde, MD, MPH1; 1. University of Colorado School of Medicine, Aurora, CO; 2. US Army Institute of Surgical Research, JBSA Fort Sam Houston, TX; 3. Brooke Army Medical Center, JBSA Fort Sam Houston, TX; 4. Uniformed Services University of the Health Sciences, Bethesda, MD; 5. Colorado School of Public Health, Aurora, CO; 6. Vanderbilt University Medical Center, Nashville, TN; 7. US Army Institute of Surgical Research, Houston, TX; 8. University of Cincinnati, Cincinnati, OH; 9. Center for COMBAT Research, University of Colorado School of Medicine, Aurora, CO

#### **Pulmonary Edema in United States Air Force Special Warfare Assessments**

1) Courtney Hintz, MD, Maj, USAF, Medical Director; 2) Michael Seib II, MD, Civ, Staff Physician; 3) Alex Keller IV, MD, Lt Col, USAF, MC, SFS Assistant Professor of Military and Emergency Medicine, USU, Bethesda, MD; Commander Special Warfare Operational Medicine Squadron, JBSA-Lackland, San Antonio, TX; 4) Hideaki L Tanaka, MD, Clinical Faculty, Undersea and Hyperbaric Medicine, Dept of Emergency Medicine, University of California San Diego, San Diego, CA

#### **Grit VS Fit: Evaluation of Physical Markers in Success of Police Tactical Officers Competing at an International SWAT Event**

Lindsay W. Wencel, MD, Emergency Medicine Resident, Orlando Health, Orlando, FL, USA; Jay Ladde, MD, Emergency Medicine Physician, Orlando Health, Orlando, FL, USA; Jesus V. Roa, MD, Emergency Medicine Physician, Orlando Health, Orlando, FL, USA; Chadwick Smith, MD, Trauma and General Surgery Physician, Orlando Health, Orlando, FL, USA; Michael Boyd, MD, Emergency Medicine Resident, Orlando Health, Orlando, FL, USA; Jessica Wanthal, MD, Emergency Medicine Resident, Orlando Health, Orlando, FL, USA; Lindsay Maguire, MD, Emergency Medicine Resident, Orlando Health, Orlando, FL, USA; Michael Caire, MD, Emergency Medicine Resident, Orlando Health, Orlando, FL, USA

#### **Efficacy of a One-Day, Mannequin-Based Extracorporeal Membrane Oxygenation (ECMO) Training Course in Swine (*Sus scrofa*)**

Lt Col Joseph K. Maddry, MD, USAF MC, Deputy Commander (1, 2, 3, 4); R. Madelaine Paredes, PhD, Senior Scientist; (2) CPT Timur Abdurashidov, DO, MC, USA, Emergency Medicine Resident; (3) Joni A. Paciocco, ADN, RN, Research Nurse Coordinator; (1) Maria Castaneda, MS, Laboratory Manager (1, 2); Allyson A. Arana, PhD, Statistician (1, 2); Crystal A. Perez, BSN, RN, Nurse Manager (1, 2); 1. United States Air Force En route Care Research Center; 2. 59th Medical Wing, Science & Technology; 3. Department of Emergency Medicine, San Antonio Military Medical Center; 4. Department of Military and Emergency Medicine, Uniformed Services University

#### **Management of Combat Casualties During Aeromedical Evacuation From a Role 2 to a Role 3 Medical Facility**

Maj Patrick C. Ng, MD, USAF MC, Director En route Care Research (1, 2); Julie Cutright, BSN, RN, Research Nurse Coordinator (1); Alejandra Mora, MS, Statistician (1); Joni A. Paciocco, ADN, RN, Research Nurse Coordinator (1); Crystal A. Perez, BSN, RN, Research Nurse Coordinator (1); Lauren

K. Reeves, MsPH, Research Coordinator (1); Lt Col Joseph K. Maddry, MD, USAF MC, Deputy Commander USAISR (1, 2). 1. United States Air Force En route Care Research Center/59th MDW/ST; 2. Department of Emergency Medicine, San Antonio Military Medical Center

#### **Neurologic Outcomes in Trauma Patients with Head Injury Necessitating Advanced Airway Management: A Comparison of Prehospital Nasotracheal, Orotracheal, and Supraglottic Airways to Emergency Department Orotracheal Intubation**

Capt Matthew M. Gangidine, MD, USAF, MC, FS (EMS/Research Fellow, Staff Emergency Medicine Physician), Department of Emergency Medicine and Paramedic Division; Steven Hulac, BS, EMT-P (Captain for Quality Management), Paramedic Division; David Edwards, BS, EMT-P (Assistant Director of Clinical Performance), Paramedic Division; Emily Caruso, MSPH (Research Projects Manager), Department of Emergency Medicine; Kevin E. McVane, MD (Medical Director, Professor, Staff Emergency Medicine Physician), Department of Emergency Medicine and Paramedic Division; Eric Campion, MD (Trauma and Acute Care Surgeon), Department of Surgery; Jason Haukoos, MD, MSc (Director for Research, Staff Emergency Medicine Physician), Department of Emergency Medicine; all from the Ernest E. Moore Shock Trauma Center at Denver Health Medical Center, Denver, CO.

#### **Pediatric Battlefield Trauma: Recommendations for Prehospital Management and Evacuation**

CPT Matthew Cohen, MD, Emergency Medicine Resident (1); SSG Levi D. Fisher, SO-ATP, NRP, FP-C, TP-C, Flight Medic; (2) CPT Joseph W. Jude, MD, Emergency Medicine Resident (1); CPT Hugh Hiller, MD, Staff Physician (3); LTC(P) Guyon J. Hill, MD, Staff Physician (1, 4); COL(R) Derek Linklater, MD, Staff Physician (1); 1. Carl R. Darnall Army Medical Center, Fort Hood, TX; 2. Fort Campbell, KY; 3. Womack Army Medical Center, Fort Bragg, NC; 4. Dell Children's Medical Center, Austin, TX

#### **Outcomes From Tranexamic Acid (TXA) in Traumatic Hemorrhage: A Prospective Cohort Study in a High Trauma, Austere, Prolonged Care Setting**

Navneet K. Baidwan, PhD1; Lina V. Mata, MD1; Chandni Patel, BPH2; Krithika Suresh, PhD3; Brenda Beaty, MSPH4; Julia Dixon, MD, MPH5; Shaheem de Vries, MBChB, MPH6; Hendrick J. Lategan, MBChB7; Adeloye Adeniji, MBChB, MMed8; Lesley Hodson, MBChB, MMed9; Suzan Mukonkole, MBChB MMed10; Jeanette Verster, MBChB MMed11; Elmin Steyn, MBChB MMed12; MAJ, Steve Schauer, DO, MS13; Col. Cord Cunningham, MD, MPH14; COL Tyson E Becker, MD, MPH15; Ernest E. Moore, MD16; Col. Vikhyat Bebart, MD17; and Adit A. Ginde, MD, MPH18; Nee-Kofi Mould-Millman, MD19. 1. Research Associate, Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 2. Professional Research Assistant, Department of Emergency Medicine, University of Colorado School of Medicine, Aurora, CO, USA; 3. Research Assistant Professor, Department of Biostatistics and Informatics, University of Colorado School of Medicine, Aurora, CO, USA; 4. Analyst lead, Adult and Child Consortium for Health Outcomes Research and Delivery Science (ACCORDS), University of Colorado School of Medicine, Aurora, CO, USA; 5. Assistant Professor, Emergency Medicine, Department of Emergency Medicine, University of Colorado School

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#### Survivability of Trauma Patients Receiving Blood Products in a Civilian Prolonged Care Setting in the Western Cape Province of South Africa

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#### Simulations of Blast Exposure on Military Personnel From 50 Caliber Sniper Rifle Training

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#### A Volumetric Comparison of Collection Techniques Used in Valkyrie Whole Blood Training

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#### Antarctic Evacuation: A Retrospective Epidemiological Study of Medical Evacuations on US Military Aircraft From Antarctica

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#### Military Medical Evacuation After the Benghazi Embassy Attack, Implications for Military Support of Diplomatic Missions

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### Hypocalcemia as a Predictor of Mortality and Transfusion

Shane Kronstedt (1), Nick Roberts (2); Aimee Steen (3); Kelsey Thompson (1); Justin Anderson (4); Jeffrey Siegler MD, EMT-P, FAEMS(5); (1) Rutgers Robert Wood Johnson Medical School, Piscataway, New Jersey, USA; (2) Eastern Tennessee State University College of Medicine, Johnson City, TN, USA; (3) Western University College of Osteopathic Medicine, Pomona, CA, USA; (4) United States Army Special Operations Command, Fort Bragg, NC, USA; (5) Washington University School of Medicine in St. Louis, St. Louis, MO, USA; \*Justin is a current active duty combat medic \*Shane is a prior active duty combat medic \*Both former SOCM/18D instructors

### The Role of Whole Blood in Civilian Trauma: A Literature Review of Whole Blood Transfusions in Military and Civilian Trauma Patients

Shane Kronstedt (1); Halli LaFrankie (1); Jeffery Siegler, MD (2); Lorenzo Paladino, MD (3); (1) Rutgers Robert Wood Johnson Medical School, Piscataway, NJ; (2) Washington University in St. Louis, Barnes Jewish Hospital Emergency Department; (3) SUNY Downstate Medical Center, Kings County Emergency Department

### Non-invasive Hemoglobin Monitoring: A Review of the Evidence

Shelia C. Savell, PhD, RN; Darren Baldwin, BS, MAA, RN; Alexis Blessing, PhD USAF, En route Care Research Center, 59MDW/ST; Lt Col Joseph Maddry, MD USA, Institute for Surgical Research USAF En route Care Research Center, 59MDW/ST JBSA Lackland/Fort Sam Houston, TX

### Electroceutical Dressing Technology Against Wound Microbial Biofilm Infection

Sashwati Roy, PhD (Professor); Nandini Ghosh, PhD (Post-doctoral fellow); Mohamed El Masry, MD PhD (Research Assistant Professor); and Chandan K. Sen, PhD (Distinguished Professor Indiana Center for Regenerative Medicine and Engineering, Department of Surgery, IU Heath Comprehensive Wound Center, Indiana University School of Medicine, Indianapolis, Indiana

### A Pilot Assessment of the Novel Handheld LifeFlow Device for Rapid Infusion of Blood Products

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### Hiding From the Enemy: Assessment of Polychromatic Light Visualization From a Distance

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Aurora, CO; LTC Chris Calvano, MD, PhD; \*\*\* Department of Surgery, Uniformed Service University of Health Sciences, Bethesda, MD

### CNS Information Processing After Heavy Weapons Training in US Navy Special Operators (SO):

#### A Component of the INVICTA Study

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### Educating the Provider for the SOF Environment: Results of Implementing the Joint Emergency Medicine Exercise (JEMX)

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### Evaluation of Navy Special Operators (SO) During Heavy Weapons Training: the Investigating Training Associated Blast Pathology (INVICTA) Study

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### Filling the Trauma Surgical Gap: Utilizing Dead Porcine Tissue for Damage Control Resuscitation and Surgical Training

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### Improving Outcomes Associated with Prehospital Combat Airway Interventions, An Unrealized Opportunity

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### A Mixed Methods End-User Assessment to Determine the Ideal Supraglottic Airway Device for Inclusion into the Medic's Aid Bag

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### A Pilot Study of Hypothermia Prevention in a Hemorrhagic Swine Model

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### Abdominal Aortic Junctional Tourniquet-Stabilised (AAJT-S) Can Be Applied Both Successfully and Rapidly by Combat Medical Technician (CMTs)

Capt. Tom Smith; Maj. Alastair Beaven; Capt. Charles Handford; Lt Col. Edward Sellon; Col. Paul Parker

### Airway Localization and Bolus Training Effects on Surgical Cricothyrotomy Success

\*CDR Caroline Schlocker, MD, Otolaryngology Staff; LCDR Steven Grosser, RN, Royal Australian Navy; \*Carmen Spaulding, PhD, Civilian; \*Rebecca Brady, MD, Otolaryngology Resident; \*Tucker Brady, MD, ER Resident; \*Jeffrey Cook, MD, ER Staff; \*HM2(EXW) Bryan Berletch, \*NMRTC-San Diego, CA

### An Analysis of Combat-Related Urologic Injuries

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### Axillary Use of Three Junctional Tourniquet Devices in Human Volunteers

Lieutenant Commander Chad A. Thompson, MD, Emergency Medicine Fourth Year Resident Naval Medical Center Portsmouth, Portsmouth, VA, USA

### Genitourinary Injuries in Combat: An Analysis of Combat Casualties in Afghanistan and Iraq: 2001–2013

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### Half a Century of Terrorist Attacks: Weapons Selection, Casualty Outcomes, and Implications for Counter Terrorism Medicine

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#### **Hyperoxia Is Associated With a Greater Risk for Mortality in Critically Ill Traumatic Brain Injury Patients Than in Critically Ill Trauma Patients Without Brain Injury**

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#### **Improved Adherence to Best Practice Ventilation Management After Implementation of Clinical Practice Guideline (CPG) for United States Military Critical Care Air Transport Teams (CCATTs)**

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#### **Resuscitation From Hemorrhagic Shock After Traumatic Brain Injury With Polymerized Hemoglobin**

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#### **Safety and Efficacy of Resuscitation From Hemorrhagic Shock With Human Polymerized Hemoglobin in Guinea Pigs**

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#### **Self-Described Training Needs of Special Operations Forces Medics**

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#### **When Minutes Matter:**

##### **A Comparison of Whole Blood Collection Techniques**

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