

## 2018 SOMSA ABSTRACTS

### 2018 Research Abstracts Selection for Podium or Poster Presentation

#### TOP PODIUM PRESENTATIONS

##### Diagnosis of ARDS from Transcutaneous O<sub>2</sub> Saturation Measurement in a Combat-Relevant Model of Prolonged Field Care and Ground and High-Altitude Evacuation

Dr Andriy I. Batchinsky, Principal Investigator; Daniel S. Wendorff, Research Associate; John A. Jones, Statistician; Brendan M. Beely, Research Coordinator; Teryn R. Roberts, Research Associate; Dr Jae Hyek Choi, Research Scientist; George Harea, Research Technician; Dr Vitali Karaliou, Research Scientist; and Kyle N. Sieck, Research Technician: The Geneva Foundation, Tacoma, WA; COL (r) (Dr) Leopoldo C. Cancio, Task Area Manager, US Army Institute of Surgical Research, JBSA Ft. Sam Houston, TX; Col (Dr) Michael R. Davis, USAF, US Army Medical Research and Materiel Command, Ft. Detrick, MD; Maj (Dr) James H. Lantry III, USAF Reserve, R. Adams Cowley Shock Trauma Center, Baltimore, MD; Maj (Dr) Valerie G. Sams, USAF, San Antonio Military Medical Center, JBSA Fort Sam Houston, TX

**Background:** Diagnosis of acute respiratory distress syndrome (ARDS) is difficult during prolonged field care (PFC). One determinant of ARDS is the tension of O<sub>2</sub> in arterial blood (PaO<sub>2</sub>) which requires invasive blood draw and analysis and is a component of PaO<sub>2</sub>-to-FiO<sub>2</sub> ratio (PFR) – an index of ARDS. We analyzed SPO<sub>2</sub>- a noninvasive marker of tissue oxygen saturation and assessed the SPO<sub>2</sub>-to-FiO<sub>2</sub> ratio (SFR) as a surrogate for PFR. We hypothesized that SFR correlates with and is a suitable surrogate for PFR in a model of combat-relevant trauma, PFC, and ground and high-altitude evacuation.

**Methods:** Anesthetized, instrumented swine ( $n = 30$ ) were subjected to single and bilateral pulmonary contusion using a humane stunner; placement of unilateral and bilateral chest tubes; decompressive thoracotomy with clamping of the right hilum due to continued hemorrhage; hemorrhage to a mean arterial pressure of 40mmHg; resuscitation and reinfusion of shed blood. Therapeutic interventions included mechanical ventilation, pressors, CPR, and veno-venous extracorporeal life support. A subset ( $n=16$ ) also underwent ground and high-altitude evacuation in a pressurized chamber at 5K, 8k and 30K ft. We performed 113 pairwise comparisons of PFR, based on arterial blood gas (I-Stat, Abbott Park, IL) and SFR based on SpO<sub>2</sub> values obtained by two devices: Draeger M540 (Draeger Medical, Telford, PA) and Aesculon, (Cardiotronics, LaJolla, CA). Linear regressions and spearman correlations were performed using SAS v 9.4 (Cary, NC).

**Results:** For the Aesculon,  $SFR = 153.19 + 0.68*(PFR)$ ,  $r = 0.6091$  and  $p\text{-value} = <0.0001$ . Draeger,  $SFR = 156.85 + 0.63*(PFR)$ ,  $r = 0.5917$  and  $p\text{-value} = <0.0001$ . The combined regression was  $SFR = 155.02 + 0.653*(PFR)$ ,  $r = 0.5962$  and  $p\text{-value} = <0.0001$ .

**Conclusion:** All regressions and correlations of SFR were significant with PFR in the setting of combat relevant trauma. SFR is a promising useful surrogate for PFR in austere settings.

##### The Influence of Social Media on Prehospital Medical Education

SGT Collin T. Dye, E Co, 91st BN, 95th CA, Fort Bragg, NC; SFC John Lacroix, US Army, Committee on Tactical Combat Casualty Care, Fort Polk, LA; SFC Dominic Thompson, US Army, AMEDD C&S, Joint Base San Antonio, TX; SSG Max Dodge, New Hampshire National Guard, Hanover, NH; SFC Paul E. Loos, US Army Special Warfare Center and School, Fort Bragg, NC; MSG (R) Harold R. Montgomery, Committee on Tactical Combat Casualty Care, Tampa, FL; Kate Kemplin, University of Tennessee at Chattanooga, Chattanooga, TN; MAJ Andrew D. Fisher, Texas A&M College of Medicine Bryan, TX, Texas Army National Guard, San Antonio, TX

**Background:** The course map to becoming a Combat Medic from Basic Combat Training to Advanced Individual Training is easily found on a number of online resources. Despite the plethora of technological resources available today, an information gap was identified by several 68W instructors. When the official course requirements are met by a trainee, how/where can they continue their prehospital education? At the end of each training cycle this was a prominent question asked of us. This gap led to the inception of Next Generation Combat Medic.

**Methods:** Study aims were to determine demographic characteristics and decisional reasoning of medics using FOAM via specific social media outlets in efforts to independently obtain additional medical education. We sought to determine any relationship and/or differences between participants' reported subconscious (intuitive) and critical (rational) reasoning, and to delineate those characteristics among demographic categories. We hypothesized that younger medics (and participant clinicians) with less experience would identify as using rational thinking in the decisions they make whereas more experienced clinicians would rely more on intuition when it comes to making decisions.

**Results:** Social Media Utilization. When asked "has this page increased and/or improved your medical knowledge base?" 89% of participants responded "probably" to "definitely yes" and 10% were neutral. Similarly, 94.26% of participants stated the FOAM social media pages provided "reliable and relevant topics for discussion and practice" and more than 66% stated the pages' content augmented their ability to treat real patients. Participants liked evidence-based practice articles and studies (15%), critical thinking is encouraged (15%), case studies and scenarios (15%), product/technique

demonstrations (9%), real-time feedback from debates with experts (9%), training ideas and recommendations (13%), interactive discussions and comments (12%), and exposure to clinicians outside their environment (11%). Sustainable Medical Training. Over 60% agreed the pages' content helped training their colleagues, unit, or company (25% were neutral; 10% disagreed). Traditionally, participants responded they had sustained their medical training with texts and studying (17%), practicing skills on their own (15%), by seeking out certification and training opportunities (17%), with social media discussions (12%). Almost 60% of participants preferred Facebook for a professional platform to discuss medical issues.

**Conclusions:** Combat medics and their advocates should take responsibility and provide quality FOAMed. This is beneficial to not only the medics, but also their patients, as they are the recipient of the prehospital professional's knowledge base. Prehospital medicine is often overlooked as a meaningful and impactful component of the healthcare system. Providing these outlets of FOAMed has, and will continue to add to the validity and efficacy of the prehospital profession.

## TOP POSTER PRESENTATIONS

### Can Unplanned Extubation Be Prevented? Introducing a Novel Airway Stabilization System for the Critically Ill SOF Patient

Shean Phelps, MD, MPH, Emerson, GA; COL Sean Hollonbeck, MC, MPH, SFS, Fort Rucker, AL; Arthur Kanowitz, MD, FACEP, Founder, CEO & CMO, Securisyn Medical, LLC, State of Colorado EMS and Trauma Medical Director (2008–2017), Highlands Ranch, CO

**Background:** Airway control in the critically injured patient is a significant challenge for the Special Operations medic. Although the incidence of unplanned extubation in the combat setting is not cited in the current literature, it likely occurs commonly due to inadequate mechanical options (i.e., tube holder, tape) for securing the airway. When combining the rigors of operating in degraded, denied, or austere environments, with the inherent challenges of SOF casualty transport to higher levels of medical care, a single unplanned extubation is one too many.

Recent studies show that in the more controlled environment of the ICU, unplanned extubation occurs in at least 7% of intubated patients and results in significant morbidity and mortality.<sup>1,2</sup> Unplanned extubation occurs when a force to remove the tube exceeds the force to restrain the tube. The greater force a tube holder can restrain against the more likely it will prevent accidental tube removal. Studies show that the most commonly used tube holders fail at forces (14–19 lbs.) much too low to prevent unplanned extubation.<sup>3</sup>

However, a novel Airway Stabilization System (FDA clearance expected in mid-2018) has demonstrated the ability to restrain against almost 100 lbs. tube removal force. This device should be studied by Special Operations Medics against current standards of care to evaluate its efficacy, ease of use, and applicability to the Special Operations environment.

<sup>1</sup>da Silva PS, et al. Unplanned Endotracheal Extubations in the Intensive Care Unit: Systematic Review, Critical Appraisal, and Evidence-Based Recommendations. *Anesth Analg.* 2012 May; 114(5):1003-14. <sup>2</sup>DeGroot RI, et al. Risk factors and outcomes after unplanned extubation in the ICU: A case control study. *Critical Care*, 2011, 15:R19. <sup>3</sup>Wagner JL, et al. Extubation

force depends upon angle of force and fixation technique: a study of 7 methods. *BMC Anesthesiology* 2014. 14:74.

### This SORT of Night: Two Mass Casualty Events in Operation Inherent Resolve

SGT David Traficante, Team Medic and CPT(P) Jason Nam, Team Physician, SORT-B, 528th Sustainment Brigade (SO)(A), Fort Bragg, NC; CPT Robert D. McLeroy, Internal Medicine Resident, Madigan Army Medical Center, JBLM, WA; CPT Rebecca Kent, Team Leader, SFC Kyle McAllister, Team Sergeant and SSG Hubert Draper, Senior Medic, SORT-B, 528th Sustainment Brigade (SO)(A), Fort Bragg, NC

**Background:** Special Operations Forces continue to conduct missions in both austere and Grey Zone environments beyond doctrinal evacuation timelines. The Special Operations Resuscitation Team (SORT) is the only Role II provider in US Army Special Operations Command. The SORT is an 8-person team comprised of a Team Leader, Team Sergeant, Physician, three SOCMs, X-ray technician, and Laboratory technician tasked to perform damage control resuscitation, prolonged field care, and casualty evacuation.

**Methods:** In support of Operation Inherent Resolve, the SORT was located with a forward ODA and partner forces and successfully managed two mass casualty (MASCAL) events of note. The data was collected from trauma casualty tracker for each event. A comprehensive after-action review was conducted to review interventions, and casualty cards were all photographed prior to patient transfer.

**Results:** In the first event, the SORT had a physician, three SOCMs, and two ancillary technicians. It had the capacity to run two critical care beds and functioned out of a building of opportunity. The SORT treated 13 partner force casualties from a VBIED attack in a 12 hour period with no fatalities at time of evacuation. The second event required the SORT to operate with a lighter footprint due to tactical requirements: one critical care bed out of a vehicle. The SORT had a nurse, two SOCMs, and one ancillary technician. They treated 9 partner force casualties from a VBIED attack also with no fatalities at time of evacuation.

**Discussion:** These events highlight that the SORT continues to validate its place on the battlefield. The SORT was able to be strategically placed far forward and respond effectively to two MASCAL events while enabling the ODA and partner forces to continue to conduct offensive operations. Both events also show that the SORT's footprint is scalable to match its tactical and operational environments.

## PODIUM PRESENTATIONS

### The Operational Advantages of Utilizing Enteral Resuscitation for Severe Burn Injury in Prolonged Field Care Scenarios

Dr David Burmeister, Research Physiologist, Dr Belinda Gomez, Postdoctoral Associate, Dr Tony Chao, Postdoctoral Associate, Dr Jennifer Gurney, COL, Surgeon and Dr Michael Dubick, Task Area Manager, United States Army Institute of Surgical Research, JBSA Fort Sam Houston, TX

### Police Department Tactical Medicine (TACMED) Program Impact on Trauma Patient Mortality: A Review of a Large Urban EMS and TACMED System

Elliot Ross, MD, MPH, San Antonio Uniformed Services Health Education Consortium and David Wampler, University of Texas Health Science Center, San Antonio, TX; Avery Kester, Xandria Gutierrez, Crystal Perez, Lauren Reeves,

Alejandra Mora and Joseph Maddry, United States Air Force En route Care Research Center/59th MDW/ST; Craig Manifold, University of Texas Health Science Center, San Antonio, TX

#### Oxygen Requirements of Mechanically Ventilated Casualties – An Evidence Based Evolution

CM Sgt (Ret), Dario Rodriguez Jr, RRT, USAF, En Route Care Research Division, USAFSAM; Col Jay Johannigman, MD, USA, Department of Surgery, University of Cincinnati; Maj Joseph Maddry, MD, USAF, AF En Route Care Research Center Thomas Blakeman, RRT, Department of Surgery, University of Cincinnati; Richard Branson, RRT, Department of Surgery, University of Cincinnati

#### Whole Blood Leukoreduction with Platelet Sparing Technology: Modified for Far Forward Operations

Dr Warren Dorlac, Principal Investigator, University of Colorado, Denver, CO; Dr Phillip Spinella, Co-Principal Investigator, Blood Solutions LLC, St. Louis, MO; Dr Einar Kristoffersen, Co-Investigator, Haukeland University Hospital & School of Medicine University of Bergen, Bergen, Norway; Dr Joar Sivertsen, Co-Investigator, Haukeland University Hospital, Bergen, Norway

#### A Systematic Review of the Current Role(s) of Physicians in Tactical Medicine

Dr Keegan Bradley, Resident Physician, Emergency Medicine, John Peter Smith County Hospital, Fort Worth, TX

#### Continuous Vital-Signs Monitoring from Medevac to Higher-Level Care

Dr Catherine Divingian, University of South Florida Morsani College of Medicine, former US Navy Medical Service Corps Officer, Tampa, FL; Darius Divingian, Bellevue University International Security Studies, former US Navy Corpsman (Fleet Marine Force), Tampa, FL

#### Forward Resuscitative Care (FRC) and the Future: Will ECMO Play a Role?

David Macků 1,2; Pavel Hedvičák 3,4; John Quinn 5,6; Vladimir Bencko 5; 1. Czech Technical University in Prague, Department of Cybernetics, Prague, Czech Republic 2. Na Homolce Hospital, Department of Biomedical Engineering, Prague, Czech Republic 3. Motol University Hospital, Department of Cardiovascular Surgery, Prague, Czech Republic 4. MAQUET Czech Republic s.r.o., Prague, Czech Republic 5. Charles University and General University Hospital, Institute of Hygiene and Epidemiology, Prague, Czech Republic 6. Northwick Park Hospital, Emergency Department, London Northwest Trust (LNWH), London, United Kingdom

#### Befriending Death: An Ethical Evaluation of Prolonged Field Care's Need to Explore the Process of Attending Death

E. Ann Jeschke, PhD, Founder, STL Amazonia, St. Louis, MO

#### Advanced Tactical Casualty Response: Integrated Combat and Medical Training Curriculum

Noel Sons, Navy Seal (SOCM) Medic, Naval Special Warfare Unit 2 and Dr Andrew M. Schaffrinna, Battalion Surgeon, 1-10th SFG(A), Panzer Kaserne, DE; Dr Kate Rocklein Kemplin, Assistant Professor of Nursing Research & Graduate Statistics Faculty, The University of Tennessee at Chattanooga, Research Program Chair, Special Operations Medical Association, Academic Editor, *Journal of Special Operations Medicine*

#### Developing a Prolonged Field Care Human Performance Training and Testing Platform

Sena Veazey and David Luellen, US Army Institute of Surgical Research, Joint Base San Antonio, Fort Sam Houston, TX; Doug Powell, MD, Third Special Forces Group (Airborne) and Womack Army Medical Center, Fort Bragg, NC; Ramey L. Wilson, First Special Forces Group (Airborne), Joint Base Lewis-McChord, WA; MSG Kaleb J. Twilligear, LTC Christine M. Vaccaro, MD, and LTC Jeremy C. Pamplin, MD, Madigan Army Medical Center, Joint Base Lewis-McChord, WA

#### Freeze-Dried Human Plasma Retains In Vitro Coagulation Activity Similar to That of Fresh Frozen Plasma

Ashley Parr, MPH, Scientific Lead, Lina Dimberg, PhD, Senior Scientist, Terry Khat, Laboratory Scientist, Ryan Bates, Laboratory Scientist, Nick Hovenga, Laboratory Scientist and Heather Pidcoke, MD, PhD, Director Translational Research, Scientific, Clinical & Laboratory Affairs, Terumo BCT, Lakewood, CO; Nate Johnson, Engineer, Product Development, Terumo BCT, Lakewood, CO

#### Venom sPLA2 Inhibition by LY315920 Rescues Mice From Lethal Experimental Envenomation and Appears to Preserve Clotting Function

Matthew R. Lewin, MD, PhD, Founder, Ophirex, Inc., Corte Madera, CA; Dr Lyndi L. Gilliam, DVM, PhD, Oklahoma State University, Stillwater, OK; Tommaso C. Bulfone, MS, Researcher, Ophirex, Inc., Corte Madera, CA

#### Fever of Unknown Origin in US Service Member – Medical Support Limited in Forward Location (West Africa)

MAJ Paul Auchincloss, MPAS, APA-C, US Army Africa Physician Assistant / Battalion Surgeon, US Army Africa / Southern European Task Force (USARAF/SETAF), Caserma Ederle, Vicenza, Italy; Maj Dana Blyth, MD, FACP, Infectious Disease Staff, Associate Program Director, SAUSHEC Transitional Year Program, San Antonio Military Medical Center, San Antonio, TX; SSG Kyle Kraft, EMT-B, Combat Medic, Platoon Sergeant, Combat Medic, HHC 1-87 Infantry (FWD), 1st Brigade Combat Team, 10th Mountain Division (Garoua, Cameroon); Ms. Gabrielle Childs, BSN, RN, Medical Plans and Exercises, US Army Africa / Southern European Task Force (USARAF/SETAF), Caserma Ederle, Vicenza, Italy; MAJ Paul Robben, MD, PhD, FACP, Fellow, Infectious Diseases, Walter Reed National Military Medical Center, Bethesda, MD; LTC Jeremy C. Pamplin, MD, FCCM, FACP, Assistant Professor of Medicine, Uniformed Services University, Director, Virtual Critical Care and Virtual Health, Madigan Army Medical Center, Tacoma, WA

#### Combat Application Tourniquet (C-A-T) Leading to Increased Hemorrhage and Shock Post Gun Shot Wound (GSW) to the Hand

Daniel J. Hull, MD, FACEP, Emergency Physician Specialist - Adult/Pediatric Emergency Medicine; Regional EMS Medical Director and Tactical Emergency Medicine Consultant, Portland, OR

#### Is REBOA Feasible in the Pre-hospital Combat Casualty Care?

B.L.S. Borger van der Burg, MD, Department of Surgery, Alrijne Hospital, Leiderdorp, the Netherlands; Capt. T.T.C.F. van Dongen, MD, PhD, Department of Surgery, Alrijne Hospital, Leiderdorp, the Netherlands & Defense Healthcare Organization, Ministry of Defense, Utrecht, the Netherlands; J.J. Morrison, MD, PhD, R. Adam Cowley Shock Trauma Center,



University of Maryland Medical System, Baltimore, MD; P.P.A. Hedeman Joosten, MD, PhD, Department of Surgery, Alrijne Hospital, Leiderdorp, the Netherlands; Lt.Col. J.J. DuBose, MD, Division of Vascular Surgery, David Grant Medical Center, Travis AFB, CA; T.M. Hörer, MD, PhD, Department of Cardiothoracic and Vascular Surgery, Örebro University Hospital, Örebro University, Sweden; CDR R. Hoencamp, MD, PhD, Department of Surgery, Alrijne Hospital, Leiderdorp, the Netherlands & Division of Surgery, Leiden University Medical Centre, Leiden, The Netherlands & Defense Healthcare Organization, Ministry of Defense, Utrecht, the Netherlands

#### **New Military Research Task Areas in Medical Robotics and Medical Autonomous and Unmanned Platforms**

Gary Gilbert, PhD, Nathan Fisher, MS, Rebecca Lee, BS, US Army Medical Research and Materiel Command (USAM-RMC) Telemedicine & Advanced Technology Research Center (TATRC), Fort Detrick, MD; Jose Salinas, PhD, US Army Institute of Surgical Research (USAISR)

#### **The United States Military Experience with Serum Buffering Agents for Combat-Related Trauma**

Maj Christopher Hewitt, DO, USAF, MC, FS, Emergency Medicine Resident and CAPT Gonzalo de Taboada, MPAS, PA-C, Department of Emergency Medicine, San Antonio Military Medical Center, Fort Sam Houston, TX

#### **Monitoring Occupational Exposures to Blast – What Have We Learned? What Are We Doing?**

MAJ Walter Carr, Research Psychologist, Military Psychiatry, Walter Reed Army Institute of Research, Silver Spring, MD; MAJ Charmaine M. Tate, Medical Officer, New Zealand Defence Force, Auckland, New Zealand; Dr Shawn G. Rhind, Defence Scientist, Defence Research and Development Canada, Toronto Research Centre, Toronto, Ottawa, Canada; Dr Catherine Tenn, Defence Scientist, Defence Research and Development Canada, Suffield Research Centre, Medicine Hat, Alberta, Canada; Dr Jason M. Bailie, Senior Clinical Research Director and Neuropsychologist, Defense and Veterans Brain Injury Center, Camp Pendleton, CA; Dr Jessica Gill, Lasker Clinical Research Scholar, National Institutes of Health, National Institute of Nursing Research, Bethesda, MD; Katie Edwards, RN, Pre-doctoral Fellow, National Institutes of Health, National Institute of Nursing Research, Bethesda, MD; Dr Fatemeh G. Haghighi, James J. Peters VA Medical Center, Associate Professor, Neuroscience, Icahn School of Medicine at Mount Sinai, New York, NY; Dr Natalya Weber, Health Science Officer, Department of Epidemiology, Preventive Medicine Branch, Walter Reed Army Institute of Research, Silver Spring, MD; Dr Stephen Recchia, PhD, Lead Mechanical Engineer, Analysis and Evaluation Technology Division, US Army Armament Research, Development and Engineering Center, Picatinny Arsenal, NJ; COL Sidney R. Hinds II, DoD Brain Health Research Program Coordinator, Blast Injury Research Program Coordinating Office, Medical Advisor to the Principal Assistant for Research and Technology United States Army Medical Research and Materiel Command, Fort Detrick, MD; Dr Thuvan N. Piehler, Injury Prevention Program Deputy Program Manager, Military Operational Medicine Research Program, US Army Medical Research and Materiel Command, Fort Detrick, MD; Dr Richard Shoge, Senior Scientist, PM - Injury Prevention and Reduction Portfolio, Military Operational Medicine Research Program, US Army Medical Research and Materiel Command, Fort Detrick, MD; Theresa Lattimore, Director, Army TBI Program, Rehabilitation & Reintegration Division, US Army Office of the Surgeon

General, Falls Church, VA; Dr Gary H Kamimori, Research Physiologist, Blast-Induced NeuroTrauma, Walter Reed Army Institute of Research, Silver Spring, MD

#### **Best Teaching Modality - Simulation, Live Tissue or Augmented Reality?**

Tania Rogerson, MBBS, Anaesthesiologist, Australian Army, Perth, Australia

#### **Seeing is Believing: Exhaled Carbon Dioxide Education Using a Live Tissue Model of Hemorrhagic Shock**

Hannelisa Callisen, PA-C, Critical Care Medicine, Mayo Clinic, Phoenix, AZ; Bhavesh Patel, MD, Critical Care Medicine, Mayo Clinic, Phoenix, AZ; Daniel Johnson, MD, Chair, General Surgery, Mayo Clinic, Phoenix, AZ; Ayan Sen, MD, Chair, Critical Care Medicine, Mayo Clinic, Phoenix, AZ; David Seamans, MD, Anesthesia, Mayo Clinic, Phoenix, AZ; Amelia Lowell, RRT, Respiratory Care, Mayo Clinic, Phoenix, AZ; CPT Jimmy Gruenewald, PA-C, MPAS; Kelly McKay; Pierre Noel, MD, Associate Director, Mayo Center for Military Medicine, Mayo Clinic, Phoenix, AZ

#### **Evaluation of Human Simulation Models (HSM) – A Current Chance for Replace or Reduce the Number of Animals in Live Tissue Training**

Dr André Lieber, Clinical Director of the German War Surgery Course, Military Hospital Berlin, Germany

### **POSTER PRESENTATIONS**

#### **Evaluation of Glucomannan Powder as an Ultrasound Transmission Gel Alternative; A Prospective, Randomized, Single-blinded, Observational Study**

CPT Sandra Milton, PA-C, EMPA Resident, Dept of Emergency Medicine, MAJ(P) Aaron Cronin, DSc, PA-C, Program Director, EMPA Residency and Jonathan Monti, DSc, PA-C, Dept of Emergency Medicine, Madigan Army Medical Center, JBLM, WA

#### **A Novel Model for Determining More Accurate Bullet Caliber from X-Ray Imaging of GSW Patients**

Paul Johnston, MPH, Research Associate, Department of Trauma Surgery, Afshin Parsikia, MD, Surgery Department and Melvin E. Stone Jr, MD, Associate Director, Department of Trauma Surgery, Jacobi Medical Center / Albert Einstein College of Medicine, Bronx, NY

#### **US Army Medic Performance Employing Tele-Ultrasound in The Assessment of Trauma; A Prospective, Observational, Pilot Study**

CPT James Levi Shearer, MPAS, PA-C, DSc candidate, CPT Kara Purdy DO, EM3, MAJ Brett Gendron DSc, EMPA Deputy Director, MAJ (P) Aaron Cronin, DSc, EMPA Program Director, Department of Emergency Medicine, Madigan Army Medical Center, Fort Lewis, WA

#### **Keep an Eye on the Operators - Afterdrop Is for Real**

Jørgen Melau, EMT/CRNA, Vestfold Hospital Trust, Tonsberg, Norway; Maria Mathiassen, MD, Telemark Hospital Trust, Skien, Norway; Jonny Hisdal, PhD/Physiologist, Oslo University Hospital, Oslo, Norway.

#### **M Before ABC. Massive Bleeding as Initial Focus in a Prehospital Trauma Life-Support Algorithm in Norwegian Armed Forces**

Jørgen Melau, EMT/CRNA, Vestfold Hospital Trust, Tonsberg, Norway; Sigurd Blix, EMT, 1. UiT – The Arctic University of Norway, N-9037 Tromsø, Norway. 2. Finnmark Hospital Trust, Hammerfest, Norway. 3. National Home Guard, Task Force Anklet HV-16, Norwegian Armed Forces; Inger Lund-Kordahl, MD. 1. UiT – The Arctic University of Norway, N-9037 Tromsø, Norway. 2. National Advisory Unit on Trauma, Division of Emergencies and Critical Care, Oslo University Hospital, Oslo, Norway. 3. Finnmark Hospital Trust, Hammerfest, Norway

#### **A Phase 3 Sub-Study of the Usability and Functionality of the Delivery System for the Sufentanil Sublingual Tablet 30mcg**

Zubaid Rafique, MD, Assistant Professor, Baylor College of Medicine, Houston, TX; James Miner, MD, Chief, Emergency Medicine, Hennepin County Medical Center, Minneapolis, MN; Harold Minkowitz, MD, Anesthesiologist, Memorial Hermann Memorial City Medical Center, Houston, TX; Karen DiDonato, MSN, RN, Executive Director, Medical Affairs and Pamela Palmer, MD, PhD, Chief Medical Officer, AcelRx Pharmaceuticals, Redwood City, CA

#### **Special Forces Medical Sergeant/Special Operations Independent Duty Corpsman Candidates:**

##### **Large Animal Module**

John Yost, Graduate Student, West Virginia University, Davis College, Morgantown, WV; Jarred Yates, Farm Manager, Reymann Memorial Farms, West Virginia University, Davis College, Wardensville, WV; Brad Smith, Assistant Professor, West Virginia University Extension, Petersburg, WV; David Workman, Assistant Professor, West Virginia University Extension, Moorefield, WV; Darin Matlick, DVM, WVU-Potomac State College, Keyser, WV; Matthew Wilson, Associate Dean and Professor, West Virginia University, Davis College, Morgantown, WV; Alison Wilson, MD, Professor and Chief of Trauma, Emergency Surgery and Surgical Critical Care, Skewes Family Chair for Trauma Surgery, WVU Health Science Center, Morgantown, WV; SFC Ludwig Brenke, Special Warfare Medical Group (A)

#### **Cold-Stored Platelets in Platelet Additive Solution for Combat Casualty Care**

Dr Kristin Reddoch Cardenas, Staff Scientist, US Army Institute of Surgical Research (USAISR), JBSA-Fort Sam Houston, TX; Umang Sharma, Biomedical Research Associate/Data Analyst, USAISR; Christi Salgado, Senior Biomedical Research Associate, USAISR; Robbie Montgomery, Senior Biomedical Research Associate, USAISR; Carolina Cantu-Garza, Biomedical Research Associate, USAISR; COL Andrew Cap, Coagulation and Blood Research Task Area Manager, USAISR

#### **Medical Cannabis & PTSD:**

##### **What is it? Can it Help? What is the Evidence?**

Barbara J. Mainville, MD, Staff Physician, Cannabinoid Medical Clinic, and Medical Director, DBI Tactical, Ottawa, Canada

#### **Precision-Tinted Spectral Filters: Successful Intervention for Medically-Resistant Headaches and Migraines After Brain Injury**

Dr Sandra Tosta, VP, and Helen Irlen, President, Irlen Institute, Long Beach; Dr Jeffrey Lewine, Principal Investigator, The Mind Research Network at The University of New Mexico Health Sciences Center, Albuquerque, NM; Dr Joseph Annibali, Chief Psychiatrist, Amen Clinics DC, Washington, DC

#### **Tourniquet Application by Untrained Civilian Responders**

CPT Kevin Lu, MD, US Army, Emergency Medicine Residency, MAJ Michael Samuels, MD, US Army, Briana Bennett, MD candidate, Sean Trostel, MD candidate, Cherisma Patel, MD candidate, Kristin Walker, MD candidate, CPT Cody Hoover, DO, US Army, Emergency Medicine Residency, Judson Alderman, MD, Emergency Medicine Residency, Samuel Willis, MD, Emergency Medicine Residency, Charles Powell, MD candidate, Keegan Nicodemus, MD candidate, Richard Schwartz, MD, Chairman of Emergency Medicine; Augusta University - Medical College of Georgia, Augusta, GA

#### **Thoracic Bioimpedance-Based Cardiac Output Measurement Using the Aesculon Monitor Correlates with Bolus Thermodilution During Severe Blood Loss in Swine**

Sydney M. Sachse, Research Technician, Milo Simovich, PhD, Research Scientist, Dr Corina Necsoiu, Research Scientist, Bryan S. Jordan, RN, MSN, Research Nurse, William Baker, Software Engineer, Mark Espinoza, Research Technician, LTC (Dr) Sung Min Ko, Research Scientist and Physician, ROK Army, CDR Elliot Ross, MD, MPH, Emergency Physician, USN, US Army Institute of Surgical Research, JBSA Ft. Sam Houston, TX; Dr Andriy I. Batchinsky, Senior Research Scientist, The Geneva Foundation, Tacoma Washington; COL (Ret) (Dr) Leopoldo C. Cancio, Task Area Manager, US Army Institute of Surgical Research, JBSA Ft. Sam Houston, TX

#### **Differences in Trauma Examination and Gauze Wound Packing Performance Between Civilian EMTs and Army Medics. A Controlled Trial-Based Assessment**

Sigurd Wisborg Blix, Emergency Medical Technician, Medical Student, The Arctic University of Norway, N-9037 Tromsø, Norway Jørgen Melau, CRNA, Division of Pre-hospital Services, Vestfold Hospital Trust, 3103 Toensberg, Norway Inger Lund-Kordahl, MD, Anaesthesia and Critical Care Research Group, Department of Clinical Medicine, The Arctic University of Norway, N-9037 Tromsø, Norway - Norwegian National Advisory Unit on Trauma, Division of Emergencies and Critical Care, Oslo University Hospital, Oslo, Norway

#### **Performance of Lifesaving Airway Intervention in the Prehospital Environment: Novel Approach to Evaluating the Decision Support Impact of Tactical Combat Casualty Care**

David Wampler, PhD, LP, FAEMS, Associate Professor of Emergency Health Sciences, University of Texas Health Sciences Center, San Antonio, TX; Tasia Long, MHS, Program Coordinator, Rena Summers, BA, Assistant Division Director, Randall Schaefer (LTC, USA, Retired), MSN, RN, ACNS-BC, CEN, Division Director, Research Division, Southwest Texas Regional Advisory Council (STRAC), San Antonio, TX; CPT Kevin Lu, MD, Chief Resident, Emergency Medicine Residency Program, Augusta University, Augusta, GA; COL Brian Eastridge, MD, FACS, Professor, Department of Surgery, Division Chief, Trauma and Emergency General Surgery, Jocelyn and Joe Straus Endowed Chair in Trauma Research, University of Texas Health Science Center at San Antonio Trauma Director, University Health System, San Antonio, TX; LTC Cord Cunningham, MD, MPH, Task Area Manager, Prolonged Field Care, Committee Chair, En Route Combat Casualty Care Committee, USAISR, San Antonio, TX

#### **Identifying Reasons Why Untrained Civilian First Responders Fail at Applying Tourniquets**

Briana Bennett, MS2, CPT Kevin Lu, MD, MAJ Michael Samuels, MD, Cherisma Patel, MS2, Kristin Walker, MS2, Sean Trostel, MS2, Judson Alderman, MD, Richard Schwartz, MD,

FACEP, Chairman of Emergency Department, Augusta University - Medical College of Georgia, Augusta, GA

### Commercial Tourniquet Instructions and Smart Phone Guidance Do Not Improve Tourniquet Application Success in First Responders

Cherishma Patel, MS2, Medical College of Georgia, Augusta, GA; Kristin Walker, MS2, Medical College of Georgia, Augusta, GA; CPT Kevin Lu, MD, US Army, Medical College of Georgia Emergency Medicine Residency Program, Augusta, GA; MAJ Michael Samuels, MD, US Army, Fort Carson, CO; Dr Richard Schwartz, MD, Chairman of the Medical College of Georgia Emergency Department, Augusta, GA

### The Practice of Austere Critical Care in Rural Africa and Resource Poor Environments

Aebhric O'Kelly, 18E, TP-C, Executive Dean, College of Remote and Offshore Medicine Foundation, Ireland; Dr Winston de Mello, Academic Dean, College of Remote and Offshore Medicine Foundation, Manchester, UK

### Hemoadsorption with CytoSorb Porous Polymer Beads Improves Survival of Rats Exposed to an Acutely Lethal Dose of Aflatoxin

Karl-Gustav Rugeberg, Pamela O'Sullivan, Timothy Kovacs, Phillip P. Chan, Thomas D. Golobish, and Maryann C. Gruda, CytoSorbents Medical, Monmouth Junction, NJ

### Treatment of Tension Pneumothorax with the Russell PneumoFix® - A Positive-pressure Ventilation Model

Dr M.Q. Russell, Kent, Surrey & Sussex Air Ambulance Trust, UK; Dr K.J. Real, University of Limerick, Ireland; Dr M. Abu-Habsa, King's College Hospital, UK; Dr R.M. Lyon, Kent, Surrey & Sussex Air Ambulance Trust, UK; Dr N.P. Oveland, Stavanger University Hospital, Norway

### Cardiac Performance Monitoring During Training of US Army Forward Surgical Teams

Michelle B. Mulder, MD, Dewitt Daughtry Department of Surgery, University of Miami Miller School of Medicine, Miami, FL; Mark D. Buzzelli, LTC, MC, Trauma Surgeon, Army Trauma Training Detachment, Miami, FL; Sarah A. Eidelson, MD, Dewitt Daughtry Department of Surgery, University of Miami Miller School of Medicine, Miami, FL; Kirby R. Gross, COL, MC, Director Army Trauma Training Detachment, Miami, FL; Andriy Batchinsky, MD, Research Scientist, Battlefield Health and Trauma Research Institute, Ft. Sam Houston; Markus Osypka, PhD, Osypka Medical, La Jolla, CA; Carl I. Schulman, MD, MSPH, PhD, Director of William Lehman Injury Research Center, University of Miami Miller School of Medicine, Miami, FL; Nicholas Namias, MD, Chief of Trauma and Acute Care Surgery, University of Miami Miller School of Medicine, Miami, FL; Kenneth G. Proctor, PhD, Dewitt Daughtry Department of Surgery, University of Miami Miller School of Medicine, Miami, FL

### Traumatic Carotid Artery Dissection in a Restrained Chinook Co-Pilot

Joshua Krieger, MD, Resident in Emergency Medicine at Madigan Army Medical Center, Tacoma, WA; SFC Sam Patrick, Battalion Senior Medic, 4/160th SOAR, JBLM, WA

### Case Study of Combat Gauze Use at POI in a Total Brachial Artery, Followed by Vascular Surgery

Leandro Castro, MD, Tactical Rescue Coordinator, CORE (Rio SWAT), Rio de Janeiro State Police, Brazil

### Case Report of SOF Operator KIA by an AK Round to the Armpit

Leandro Castro, MD, Tactical Rescue Coordinator, CORE (Rio SWAT), Rio State Police, Brazil

### Double Trouble or Twice as Nice? A Review of Dual Sequence Defibrillation

2d Lt. Jessica Zhen, MSIV Uniformed Services University, Bethesda, MD; Andrew Zhen, MSIV Midwestern University Arizona College of Osteopathic Medicine, Glendale, AZ

### Undersea Hyperbaric Medicine 2018

Col (Ret) William Buck Dodson, MD and Technical Sergeant Adam E. Tyler, USAFSAM, 711HPW, Wright-Patterson AFB, OH

### Lead Exposure in the Special Operations Shooter

SFC (Ret) Jonathan W. Brandon, UCSF MSIV; Justin K. Solarczyk; LTC Timur S. Durrani, MD, MPH, MBA, UCSF Associate Professor of Medicine, 1st SFC DIMA

### Puff, Puff, or Pass: Quantitative Analysis of Special Operations Forces, Conventional Military, and Civilian Clinician Knowledge of Medical Marijuana in Treating Combat-Associated Trauma

Kat Andrews, Brooke Bennington, Claire Elliott, Lindsey Justice, Mady Stallings, Taylor Theobald, Kate Kemplin. School of Nursing, University of Tennessee at Chattanooga, Chattanooga, TN

### Facial Trauma Care in the Austere Environment

Scott Farber, MD, Craniofacial Fellow, New York University Department of Plastic Surgery, Lieutenant, United States Navy Reserve, Medical Corps

### Fatigue Recovery Enhancement uUing Noninvasive Neuromodulation Technology

Richard Hanbury, MBA (Healthcare), Dip Law, BAHons, Sana Health Inc, 72 Holstein Road, San Anselmo, CA; Brad Chedister, BS BioEng, MS TechnManagement, MS in Eng, Management, Draper Laboratory: Warfighter Systems Architect /Subject Matter Expert- Focus on Special Operations, SOW-ERX: Special Advisor with focus on Tactical Medical and Human Performance, Optimization Technologies; Philippe A. Souvestre, MD, CES, CEA/PhD, FAsMA, NeuroKinetics Health Services, Inc, Hycroft Medical Center, Vancouver, BC, Canada

### Management of Acute Concussion:

#### From Injury to Return to Duty

Wally Graves III, MSW, HMCS(SEAL/SOIC) (Ret); Jason M. Bailie, PhD; Keith A. Stuessi, MD, CAPT/USN (Ret)

### Repetitive Blast and Brain Health in

#### Special Operations Medicine

Jason M. Bailie, PhD; Josh Duckworth, CDR, MC, USN; Wally Graves III, MSW, HMCS (SEAL/SOIC) (Ret)

### Review of Rotary Wing Rescue Hoist Devices

Allison N. Moczynski, Biomedical Research Engineer, Injury Biomechanics Division, US Army Aeromedical Research Laboratory, Fort Rucker, AL; Charles A. Weisenbach, Biomechanical Engineer, Injury Biomechanics Division, US Army Aeromedical Research Laboratory, Fort Rucker, AL; Timothy J. Ward, NCOIC, En Route Care Branch (AACC, JECC), US School of Army Aviation Medicine, Fort Rucker, AL; Dr James



S. McGhee, Research Physician, Injury Biomechanics Division, US Army Aeromedical Research Laboratory, Fort Rucker, AL

#### Novel Use of XSTAT 30 for Management of Non-Compressible Torso Hemorrhage

Alicia Bonanno, MD; Todd Graham, BS; Lauren Wilson, BS; Brianne Madson; James Ross, PhD

#### Using Heart Rate Variability to Measure Sleep Quality During Simulated Training

Charles R. Hutchinson, CPT USA DO, Resident MACH, Todd Wical, CPT USA DO, Resident MACH, Joseph Rangel, SSG USA, EMTP, 75th RR STB, Stephano Corbosiero, SSG USA, EMTP, 75th RR STB, Jonathan Bailey, MAJ USA MD, FAAFP, 75th RR STB, Kristen Koenig, MAJ USA MD, FAAFP, Residency Faculty; Ft. Benning, Columbus, GA

#### EldonCard Accuracy in a Far Forward Environment for Fresh Whole Blood Screening

Richard Coulter, CPT, RN, Army, APO, AE, Germany; Gabriela Ayala, SSG, 68W, Army, Aurora, IL; Scott Munday, SSG, 68W, Army, San Antonio, TX

#### Teaching the B-Con Programme Outside the US: The Italian Experience

Daniele Valsecchi, MD, North-West Mobility Center, Italian Red Cross Volunteer Military Corps, Genoa, Italy; Lorenzo Tiraboschi, RN, North-West Mobility Center, Italian Red Cross Volunteer Military Corps, Genoa, Italy; Thomas Nicolussi, RN, North-East Mobility Center, Italian Red Cross Volunteer Military Corps, Verona, Italy; Michele Antonio Michelon, RN, North-East Mobility Center, Italian Red Cross Volunteer Military Corps, Verona, Italy; Alberto Stevan, RN, North-East Mobility Center, Italian Red Cross Volunteer Military Corps, Verona, Italy; Michele Bonetti, North-West Mobility Center, Italian Red Cross Volunteer Military Corps, Genoa, Italy; Michele Franzin, RN, North-West Mobility Center, Italian Red Cross Volunteer Military Corps, Genoa, Italy; Fabio Rispoli, MD, Southern Mobility Center, Italian Red Cross Volunteer Military Corps, Bari, Italy; Romano Tripodi, MD, Department of Health Operations, National Inspectorate of the Italian Red Cross Volunteer Military Corps, Rome, Italy

#### Evaluation of a Lyophilized Platelet-Derived Hemostatic Product

Dr James A. Bynum, Dr Michael A. Meledeo, Grantham C. Peltier, Colby S. McIntosh, Ashley S. Taylor, and Robbie K. Montgomery, US Army Institute of Surgical Research (USAISR), San Antonio, TX; Dr Todd M. Getz and Dr Michael G. Fitzpatrick, Cellphire Inc, Rockville, MD; COL Andrew P. Cap, USAISR, San Antonio, TX

#### Teaching Operational Canine Medical Care: Structuring Education Around Existing Prehospital Care Models

LTC Daniel S. Schwartz, MD, FACEP, FAEMS, BDE Flight Surgeon 28th ECAB, PAARNG, Medical Director/TEMS Support Physician, Pennsylvania District Attorney SOG & Allegheny County SWAT; Dr Sean D. Smarick, VMD, DACVECC, Hospital Director, Allegheny Veterinary Emergency Trauma & Specialty, Pennsylvania

**Optimal Field-Expedient Blood-Typing Kit for SOF Medics**  
Shane M. Kronstedt, SEAL (Trauma II Instructor), SEAL Team 10; Justin L. Anderson, 2/75 Ranger (Trauma II Instructor), 2/19 SFG(A), Joint Special Operations Medical Training Center (JSOMTC), Ft. Bragg, NC; Daniel Grabo, MD, Associate Professor of Surgery, West Virginia University, Critical Care and Trauma Institute, Morgantown, WV

#### Creating Bleed Safe Communities Utilizing TCCC/TECC Modalities

Joshua Bobko, MD, FAAEMS, West County SWAT, Corona Del Mar, CA and Chief Robert Wylie (Ret), BS, EMT-T, St. Peters, MO

**Successful Application of a Systematic Approach to Snakebite Treatment Under Austere Conditions in Sub-Saharan Africa With a Novel Freeze-Dried Antivenom**  
Jordan Benjamin, Herpetologist and Snakebite Researcher, NREMT, Paramedic Student, Founder of Snakebite Medicine Solutions

**Recent Advances in Austere Combat Surgery: Use of REBOA as Well as Blood Challenges by SOF Medical Forces in Support of Operation Inherent Resolve**  
Dr D. Marc Northern, Maj, Surgeon, Dr Justin Manley, Maj, Surgeon, Dr Regan Lyon, Maj, EM Physician and Dr Daniel Farber, Maj, Anesthesiologist, 720 OSS/SOST, Hurlburt Field, FL; Dr Benjamin Mitchell, Lt Col, EM Physician, 720 OSS/SOST, Birmingham AL; Dr Jonathan Lundy, LTC, Surgeon, Carl R. Darnall Army Medical Center, Ft. Hood, TX; Dr Joseph J. DuBose, Lt Col, Surgeon, David Grant Medical Center, Travis AFB, CA; Dr Todd E. Rasmussen, Col, Surgeon, MEDCOM USAMRMC, Ft. Detrick, MD; Dr John Holcomb, Col (Ret), Professor, Dept of Surgery, University of Texas McGovern Medical School, Houston, TX

**Computed Tomographic Coronary Plaque Presence and Risk by Composition, Form and Function in High Stress Military Occupations**  
Eric E. Harrison, MD, Fellow of ACC, AHA, SCAI, ACP, SOF Coronary Artery Research Center, Joint Special Operations University Volunteer Faculty, Associate Professor, Morsoni School of Medicine, University of South Florida, Tampa, FL; Pres/CEO/CAIO PrivaCORS Inc, Personalized Preventive Cardiac Imaging and Concierge Precision Cardiology; IBM Watson Healthcare Global Medical Imaging Collaborative, Director of Advanced Cardiac Imaging, Cardiology, and Medicine, Joint USF/HCA Memorial Hospital Program

#### Delayed Presentation of Suspected Decompression Sickness

CPT Kyle Couperus, Madigan Army Medical Center (MAMC) Emergency Medicine R3 Resident; CPT Nick Derfler, MAMC EM R2 Resident; CPT Justin Grishm, MAMC EM R2 Resident; CPT Travis Melton, MAMC EM R3 Resident, Joint Base Lewis-McChord, WA

**Hocus POCUS: Beyond the FAST Exam . . . Next Level Special Operations Ultrasound Applications**  
Sean G. Smith, Flight Nurse-Paramedic, Critical-Care Professionals International



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