



# Research Today



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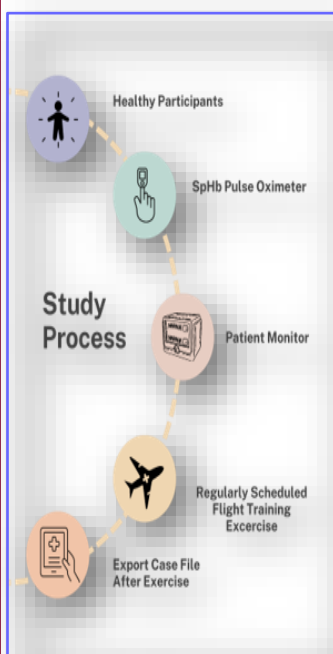
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## 2023 Military Health System Research Symposium Award Winners

By Maj Davis, Williams T.

The 59th Medical Wing Science and Technology En Route Care Research Center (ECRC) team received an honorable mention at the 2023 Military Health Services Research Symposium for a poster presentation of their work titled, 'Reliability of Continuous Noninvasive Hemoglobin Monitoring in Healthy Participants During En Route Care Training.'

This study was funded by the 711th Aerospace & Operational Medicine Enterprise Studies & Analysis program. ECRC led a multisite site study with collaborators from the 711th Human Performance Wing to include BATDOK engineers and clinicians from USAF School of Aerospace Medicine. Currently fielded equipment for en route care teams enables a noninvasive total hemoglobin measurement through a pulse co-oximeter, but limited data are available for how this parameter performs in the operational environment.



The study evaluated total noninvasive hemoglobin on healthy participants during training flights. This collaboration developed a wireless capability for BATDOK, referred to as Case Downloader, to download case files from patient monitors with multiple vital sign readings each minute. This retrospective data capture capability enabled the research team to collect data from the operational medicine environment without impacting training or exercise goals. Support and collaboration from US Transportation Command was critical to enable data collection in the operational environment.

SpHb measures were successfully captured for over 97% of possible measures in the exercise environment during the movement of healthy participants similar to actual en route care transports. BATDOK engineers refined the Case Downloader based on end user feedback. This application was included in the most recent update to BATDOK software, so the materiel product from this research can now be used by anyone with access to BATDOK. The Case Downloader is currently in use during both en route care training and research from actual flights to increase data capture and close knowledge gaps for en route care transports.

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## 2023 Military Health System Research Symposium Award Winners

By Capt. Zahari Tchopev



U.S. Air Force Capt. Zahari Tchopev, with the 959th Medical Group at San Antonio Military Medical Center in Joint Base San Antonio - Fort Sam Houston, Texas, receives second place in the 2023 MHSRS

Dr. Tchopev presented his project, “Incidence and Clinical Features of Nightmare Disorder and Trauma Associated Sleep Disorder in U.S. Military Personnel,” at the 2023 Military Health System Research Symposium (MHSRS) as one of the Young Investigator competitors, winning second place out of over 400 abstract submissions. The incidence of nightmares has been reported to be higher in military personnel, and specifically the development of nightmare disorder. Recently, a seemingly military specific, extreme manifestation of nightmares, called trauma associated sleep disorder (TSD) has been described out of the same research group. Dr. Tchopev and his colleagues sought to describe the incidence of nightmare disorder and trauma associated sleep disorder among active-duty military members, and more specifically, identify differing clinical characteristics of these patients for early identification.

They found that the incidence of probable nightmare disorder among military members was higher than previously reported, at 51.5% of all new sleep medicine patient referrals. Of those, 6.5% appeared to have clinical characteristics consistent with TSD specifically. Those with TSD had more significant clinical correlates, including depression, anxiety, post-traumatic stress disorder, traumatic brain injury, chronic pain, insomnia, and disturbances from their nightmares, compared to those with nightmares alone. Furthermore, using the nightmare disorder index (NDI) clinical screening tool, those patients with TSD could be identified with over 90% sensitivity and specificity, allowing for earlier recognition.

Uniquely, there was a relatively high rate of TSD in women, which made up 38.5% of TSD patients, but only 27.5% of the entire cohort, suggesting the importance of appreciating diversity in patient populations.

### 59 MDW/ST RESEARCH HIGHLIGHTS:

#### **Targeted Delivery of Epigallocatechin Gallate by Hemostatic Nanocapsules to Control Hemorrhage and Reduce Infectious Complications Following traumatic injury.**

**PI:** Chester Hutcherson, PhD, 59MDW/STT What is it? A treatment option to significantly reduce blood loss while simultaneously providing essential preemptive antimicrobial care that does not rely on traditional antibiotics. Future Use: An intravenously administered hemostatic nanocapsule system capable of hemorrhage control and local delivery of Epigallocatechin gallate (EGCG) will increase combat casualty survivability by supplementing existing hemostatic wound dressings while also Reducing infectious complications. Current Status: The study is approved.

**Open Funding Opportunities:** Amyotrophic Lateral Sclerosis, Autism, Bone Marrow Failure, Breast Cancer, Breast Cancer II, Chronic Pain Management, Combat Casualty Care, Combat Readiness Medical, Duchenne Muscular Dystrophy, Epilepsy, Hearing Restoration, Joint Warfighter Medical, Kidney Cancer, Lung Cancer, Lupus, Melanoma, Military Burn, Multiple Sclerosis, Neurofibromatosis, Orthotic & Prosthetics Outcomes, Ovarian Cancer, Pancreatic Cancer, Parkinson’s, Peer Reviewed Alzheimer’s, Peer Reviewed Cancer, Peer Reviewed Medical Research, Peer Reviewed Orthopaedic, Prostate Cancer, Rare Cancer, Reconstructive Transplant, Spinal Cord Injury, Tick-Borne Disease, Toxic Exposures, Traumatic Brain Injury & Psych Health, Tuberous Sclerosis Complex, Vision, and Pharmacotherapies for Alcohol and Substance Use Disorders (PASA) Research Programs. For more information, visit [https://cdmnp.health.mil/pubs/press/2023/funding\\_press\\_release23](https://cdmnp.health.mil/pubs/press/2023/funding_press_release23).

## “CSION” Develops Leaders in Medical Research

By 59th Medical Wing Chief Scientist’s Office



The ability of military clinicians to conduct medical research is often limited by competing demands and a lack of mentorship opportunities. The 59th Medical Wing’s Chief Scientist’s Office (59 MDW/ST) is working to remove these barriers and improve the realm of health care with the Clinician Scientist Investigator Opportunity Network or “CSION.”

The Clinician Scientist Investigator Opportunity Network is a 2-year additional-duty research fellowship that teaches clinicians how to conduct ‘requirements-driven’ research within the Department of Defense.

To be eligible for the program, applicants have to have completed residency graduate medical or dental education training, not be currently enrolled as a graduate medical or dental education trainee, and have their department leadership’s approval to focus 25% of

their duty hours on CSION participation. The total commitment is approximately 900 hours of duty time dedicated to research over the span of two years.

Between Jan. 2019 and Dec. 2022, 12 CSION fellows graduated from the program. With the support of their mentors, the fellows initiated 204 research protocols, created 489 publications and presentations, and secured 33 research grants. All graduates of the program have remained active in clinical research and multiple graduates are currently assigned to research positions.

The 59 MDW/ST’s vision is “to grow medical leaders.” The CSION program helps realize that vision by improving the quality of military medical research and health care.

The program is co-sponsored by 59 MDW/ST and the San Antonio Uniformed Services Health Education Consortium dean and includes partnerships with the United States Army Institute of Surgical Research and the Naval Medical Research Unit – San Antonio – each a valuable source of program mentors.

The CSION program also offers a unique pathway to research funding. Through a Technology Transfer Agreement, 59 MDW/ST partnered with the nonprofit organization Henry M. Jackson Foundation for the Advancement of Military Medicine, Inc. to create a seedling proposal program. This funds two research projects through a competitive selection process open only to current CSION fellows.

This year, the seedling proposal program awarded project funding to U.S. Army Lt. Col. (Dr.) Emilio Fentanes at Brooke Army Medical Center’s cardiology department and U.S. Air Force Maj. (Dr.) Nicholas Villalobos, a 59th MDW member at Brooke Army Medical Center’s internal medicine department. Both fellows are conducting research that seeks to improve the health care of service members.

## The Aerospace Medical Association recently honored Dr. Paul M. Sherman, M.D., Col (Ret.), USAF

By Courtesy Story



JOINT BASE SAN ANTONIO-LACKLAND, Texas – Retired U.S. Air Force Col. Dr. Paul M. Sherman, was recently honored with a fellowship for his exceptional contributions to aerospace medicine at the 2023 Aerospace Medical Association's 93rd Annual Scientific Meeting.

Dr. Sherman, currently serving as the Director of Radiological and Aerospace Medical Research at the 59th Medical Wing Chief Scientist's Office, Defense Health Agency, Joint Base San Antonio Lackland, Texas, has had a distinguished career.

He previously served at the USAF School of Aerospace Medicine and the 711th Human Performance Wing, retiring with the rank of colonel after 27 years of service.

His professional achievements include being named a Fellow of the American College of Radiology; an honor reserved for only 10 percent of radiologists nationwide. Dr. Sherman's extensive body of work encompasses 37 peer-reviewed journal articles, 3 book chapters, and over 125 national lectures and presentations.

Throughout his career, he has held notable roles, including Program Director of the San Antonio Uniformed Services Health Education Consortium Radiology Residency Program and Assistant Director of Graduate Medical Education for the 59th Medical Wing. Furthermore, his contributions extended to the national medical education arena as a member of the Accreditation Council for Graduate Medical Education Transitional Year Review Committee from 2013 to 2019.

In addition to his academic and leadership accomplishments, Dr. Sherman holds the title of Associate Professor of Radiology at the Uniformed Services University, earned recognition as an Academician from the International Academy of Aviation and Space Medicine in 2018, and was appointed as an Associate Fellow of the Aerospace Medical Association in 2020.

Dr. Sherman's research efforts have been instrumental in collaborative neuroimaging projects with the Department of Defense, national, and international partners. These studies have delved into the biomedical effects of flight on aircrew and special operators, as well as the medical impacts of directed energy exposure. Impressively, he has secured over \$15 million in Department of Defense investigator-initiated research grants, underlining his standing as a prolific clinical scientist.

## Military Health and Readiness Improved through Collaboration with Small Business

By Staff Sgt. Kelsey Martinez, 59th Medical Wing Public Affairs



MILITARY PERSONNEL FACE SIGNIFICANT MUSCULOSKELETAL INJURIES, PARTICULARLY ANKLE INJURIES, WHICH CAN LEAD TO TRAINING DISRUPTIONS, COSTLY MEDICAL ATTRITION, AND AFFECT MILITARY READINESS. TO ADDRESS THIS, THE AIR FORCE INITIATED THE VERSATILE INJURY PREVENTION AND EMBEDDED RECONDITIONING PROGRAM (VIPER) AND PARTNERED WITH TAYCO BRACE TO DEVELOP THE XAB (EXTERNAL ANKLE BRACE). THIS INNOVATIVE BRACE OFFERS BETTER RANGE OF MOTION AND COMFORT, REDUCES RECOVERY TIME, AND CAN BE WORN OVER COMBAT BOOTS OR ATHLETIC SHOES. IT IS EXPECTED TO SIGNIFICANTLY IMPROVE RETURN-TO-DUTY RATES, REDUCE DISRUPTIONS, AND ENHANCE OVERALL OUTCOMES FOR SERVICE MEMBERS WITH ANKLE INJURIES. (COURTESY PHOTO TAKEN BY MR. JOSE-NOEL ROCHA, TAYCO BRACE INC.)

Joint Base San Antonio- Lackland, Texas – In the course of their duties, many military personnel, including Security Forces personnel, parachutists, Air Force Basic Military Trainees (BMTs), and Special Operators, often endure significant physical stress on their lower body joints and soft tissues. These stresses can lead to musculoskeletal injuries (MSKI) that impact their well-being, performance, and overall quality of life. Importantly, such injuries also hamper the Department of Defense's readiness and drive up both operational and healthcare costs.

Annually, MSKI affect approximately 800,000 military service members, resulting in 2.2 million medical visits, 25 million lost duty days, and healthcare costs totaling around \$3.7 billion.

Ankle injuries are the most prevalent MSKI among military personnel, with service members being five times more likely to suffer ankle injuries compared to the general population. This makes ankle injuries a leading cause of lost training and operational time. Closer to home, medical attrition from BMT costs the Air Force up to \$46 million each year, with MSKI being the primary reason for medical non-deployable status across the Air Force and the leading cause of medical discharges from the military.

To address these challenges, the 559th Medical Group introduced the Versatile Injury Prevention and Embedded Reconditioning program (VIPER) in 2017. This marked the Air Force's pioneering endeavor to have athletic trainers embedded within the unit, providing acute medical and rehabilitation services to basic military trainees and technical students.

Recently, Maj. (Dr.) Korey Kasper and Maj. (Dr.) Steven Trigg, sports medicine physicians and clinical researchers heading the VIPER program, identified a commercial company called TayCo Brace that was developing an advanced alternative to the standard walking boot, commonly prescribed to safeguard a patient's foot and ankle following injury or surgery. The adoption of this new technology empowers injured servicemembers to swiftly regain their function and mission effectiveness, benefiting both the member and supporting the training of warfighters and military operations.

Maj Kasper emphasized that their collaboration with TayCo adapted a commercial external ankle brace specifically for military training activities, facilitating quicker recovery and averting costs related to training delays. This innovative approach enhances the wearer's range of motion and comfort, optimizing the healing, recovery, and restoration of function. To realize the potential for military use, the team partnered with the 59th Medical Wing Chief Scientist's Office Science & Technology (S&T) team and the 559th Trainee Health Squadron, collectively seeking and securing AFWERX Small Business Innovation Research (SBIR) funding.

Over the past few years, Majors Kasper and Trigg have collaborated with TayCo Brace to evaluate designs, provide feedback for improvement, and support its development. This culminated in the completion of the next generation brace this summer, with availability expected in early 2024 or possibly sooner. Named the XAB (eXternal Ankle Brace), this new design employs a range-of-motion-stop hinge, offering healthcare professionals greater control over functional recovery and return to duty. It includes a new strapping system for enhanced comfort and durability, as well as improved independence for service members in donning/doffing uniforms, equipment, and gear. The XAB also features an anti-slip plantar strap to enhance user safety in wet and rugged terrains. Furthermore, the material hardening and ruggedization of the XAB have reduced its weight, enhancing portability and durability in training and combat without sacrificing efficacy. The military stands to gain significantly from this innovation, with expected return to duty rates up to four times faster, fewer performance disruptions, and improved outcomes after ankle and hindfoot injuries. The XAB is two to three times lighter than a standard walking boot and is the only external ankle-foot orthosis (AFO) that can be worn over a combat boot or athletic shoe.

Continue

This provides exceptional stability and balance while limiting inversion/eversion movement, reducing downtime and recycled trainees as compared to traditional solutions like the walking boot. In many cases, trainees and service members can return to training, normal work/operations, or even combat almost immediately, enabling them to navigate wet, rough, and rocky terrain safely and effectively.

Kasper expressed the value of partnering with small businesses through AFWERX for developing or adapting products to meet the specific needs of Airmen, emphasizing it as a synergistic force multiplier and hoping for continued support for such relationships throughout the Air Force.

TayCo Brace has made the XAB commercially available for procurement and collaborated with the Defense Logistics Agency (DLA) to add the XAB to their medical Electronic Catalog (ECAT), facilitating easy procurement for the military. TayCo Brace is also involved in multiple SBIR R&D contracts through the AFWERX SBIR program, aimed at further reducing weight and profile while ruggedizing materials and design for military applications.

## 59MDW: Chief Scientist's Office Joins DARPA as a Program Manager

By 59th Medical Wing Public Affairs



Lt. Col. (Dr.) Adam Willis, formerly a Medical Director and Clinician Scientist of the 59th Medical Wing Chief Scientist's Office, now serves as the program manager at the Defense Advanced Research Projects Agency in the Biotechnologies Office. His role in the BTO is developing new programs to push technology development and generating new technologic solutions for the warfighter. He also oversees existing programs, creates training for faculty, and builds Small Business Initiative Research and Small Business Technology Transfer opportunities, with a focus on operational needs.

In 2022, Lt. Col. Willis was one of four officers in the Air Force selected for the DARPA Service Chiefs Fellows Program, which immerses military officers and government civilians in innovative, fast-paced science and technology research. This three-month fellowship provided Lt. Col. Willis with insight into cutting-edge technology while potentially facilitating the development of future DARPA technologies. This experience led to his recruitment as a DARPA program manager in 2023.

During his time at the 59th MDW Chief Scientist's Office, Lt. Col. Willis was highly productive. At Brooke Army Medical Center he worked as a staff neurointensivist and neurologist. He also executed clinical research in the biomechanics of brain injury and neuroergonomics of operational tasks to improve overall warfighter brain health for performance and readiness.

Additionally, Lt. Col. Willis is a trained flight surgeon and holds the Special Experience Identifier as a physician member of a Critical Care Air Transport Team.

In 2020, Lt. Col. Willis was accepted as a fellow to the Clinician Scientist Opportunity Network which trains and mentors clinicians in executing research within the Department of Defense. He quickly ramped up his research program into a nearly \$10 million dollar research portfolio while at the 59th MDW, with over 30 collaboration agreements between universities, Biotech companies and other DoD research laboratories. As his experience grew, he published over 20 peer-reviewed journal articles, several book chapters and gave numerous technical presentations. Always looking to the future of research, Willis has mentored numerous military offices, medical residents, and engineering graduate students to develop the next generation of biomedical researchers.

Lt. Col. Willis began his journey as an officer in the Air Force in 1999. His education includes a bachelor's degree in physics from the University of Notre Dame, a Master of Science, and a Doctor of Philosophy in theoretical and applied mechanics from the University of Illinois Urbana-Champaign. He also obtained his Doctor of Medicine degree from the University of Illinois Chicago. During his clinical residency, he specialized in neurology, and his fellowship training was for neurocritical care with an active board-certification in both. Throughout his career, Lt. Col. Willis received several notable awards including recognition for his achievements in operational and scientific research.

As the DARPA program manager, Lt. Col. Willis' focus remains on challenges of casualty care within the near-peer environment, biomechanics of brain injury, neuroergonomics of operational tasks, and more.

**59 MDW/ST RESEARCH HIGHLIGHTS:****Evaluation of a Chemical Therapeutic Strategy to Ameliorate Hemorrhagic Shock using *Rattus Norvegicus***

**PI:** Lt Col Thomas J Percival, Cardiothoracic Surgery, 959 MDG, Shauna Hill, Ph.D., 59 MDW/ST

**Summary:** Recently awarded by RESTORAL, an upcoming research project is set to break new ground in the management of hemorrhagic shock, a leading cause of preventable battlefield fatalities. Principal Investigator Lt Col Thomas J Percival and Lead Scientist Shauna Hill, in partnership with the Wyss Institute at Harvard, are leveraging the encouraging findings of the DARPA-sponsored Biostasis program to forge novel treatment strategies.

The project pioneers a new frontier in hemorrhagic shock management, investigating the potential of biostasis-inducing compounds to limit metabolic activity, thereby enhancing organ resilience and viability in a rat model of hemorrhagic shock. It hypothesizes that the early induction of biostasis, through the administration of these compounds, can be a lifesaver in combat scenarios where immediate blood loss replacement isn't feasible. The research will screen and identify the most effective biostasis-inducing compound that enhances tolerance to hemorrhagic shock and ascertain its efficacy in boosting organ viability post-hemorrhagic shock. Beyond advancing our understanding of hemorrhagic shock management, this project seeks to redefine battlefield casualty care. By slowing metabolic processes and mitigating the injury impact, this innovative method could potentially provide crucial extra time for lifesaving interventions, effectively transforming survivability and prognoses for personnel affected by such injuries. The successful outcome of this research promises significant advancements in casualty care management. It seeks to modernize the conventional approach to hemorrhagic shock, offering not just improved patient outcomes, but a potential game-changer in resource-limited, high-volume patient situations that are characteristic of combat scenarios.

**Publications****(August - October)**

- Paredes, R. Madelaine PhD; Castaneda, Maria MS; Mireles, Allyson A. PhD; Rodriguez, Dylan MS; Maddry, Joseph MD. Comparison of hydroxocobalamin with other resuscitative fluids in volume-controlled and uncontrolled hemorrhage models in swine (*Sus-scrofa*). *Journal of Trauma and Acute Care Surgery* 95(2S): p S120-S128, August 2023. DOI: 10.1097/TA.0000000000004049.
- Hegeman EM, Bates T, Lynch T, Schmitz MR. Osteomyelitis in Sickle Cell Anemia: Does Age Predict Risk of Salmonella Infection? *Pediatric Infectious Disease Journal*. 42(8):e262-e267, 2023 08 01. <https://pubmed.ncbi.nlm.nih.gov/37079601/>.
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- Daniel J Cybulski, Zachary Matthews, John W Kieffer, Theresa M Casey, Angela B Osuna, Korey Kasper, Dianne N Frankel, James Aden, Heather C Yun, Joseph E Marcus. Impact of SARS-CoV-2 Arrival Surveillance Screening by Nucleic Acid Amplification Versus Rapid Antigen Detection on Subsequent COVID-19 Infections in Military Trainees. *Clinical Infectious Diseases*, 10 August 2023; ciad466, <https://doi.org/10.1093/cid/ciad466>.
- Gardner CL, Raps SJ, Kasuske L. Cross-sectional Analysis of Health Behavior Tracking, Perceived Health, Fitness, and Health Literacy Among Active-Duty Air Force Personnel. *Comput Inform Nurs*. 2023 Aug 15. doi: 10.1097/CIN.0000000000001060. Epub ahead of print. PMID: 37580053.
- Zingg SW, Elterman J, Proctor M, Salvator A, Cheney M, Hare J, Davis WT, Rosenberry N, Brown DJ, Earnest R, Robinson FE, Pritts TA, Strilka R. Descriptive Analysis of Intratheater Critical Care Air Transport Team Patient Movements During Troop Drawdown: Afghanistan (2017-2019). *Mil Med*. 2023 Aug 29;188(9-10):3086-3094.

### Publications (August - October)

- Mancha F, Martinez MA, Sifuentes D, Mendez J, Arana AA, Maddry JK, Schauer SG. Comparative Analysis of Whole Blood Infusion Effects: Assessing LifeFlow Versus Pressure Bag in a Sus scrofa Model. *Mil Med.* 2023 Aug 25: usad324. doi: 10.1093/milmed/usad324. Epub ahead of print. PMID: 37625036.
- Schauer, SG, April, MD, Araña, AA, Long, BJ, Maddry, JK. Ketamine during resuscitation - Is it as hemodynamically perfect as we think? *American Journal of Emergency Medicine.* 2023 Aug 26;S0735-6757. <https://pubmed.ncbi.nlm.nih.gov/37690953/>.
- Mark R. Brown, Joshua M. Boster, Stephen M. Goertzen, Michael J. Morris, Erik S. Manninen. Enterococcus faecium Empyema Following Extracorporeal Membrane Oxygenation for COVID-19 Acute Respiratory Distress Syndrome. *Cureus.* 2023 Aug 1;15 (8):e42789. <https://pubmed.ncbi.nlm.nih.gov/37664261>
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- Joseph K. Maddry, Amber Mallory, Allyson A. Araña, Michael J. Morris, Melissa Ann R. Clemons, Alexander J. Burdette, Mark W. True, Debra Niemeyer, Erik K. Weitzel. Establishment of the Clinician-Scientist Investigator Opportunity Network to Develop Military Medical Research Leaders. *Military Medicine* 2023 Sep 6, Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/37702367/>.
- Darren Baldwin, Allyson A. Araña, Shelia C. Savell, Julie Cutright, Kim Medellin, Maria Castaneda, Vikhyat S. Bebarta, William T. Davis, Joseph K. Maddry, Patrick C. Ng. A Descriptive Study of Casualties Evacuated Out of Afghanistan by Critical Care Air Transport Teams During the Withdrawal of U.S. Troops. *Military Medicine* 2023 Sep 13. Online ahead of print. <https://pubmed.ncbi.nlm.nih.gov/37703066/>.

### Podium Presentations:

#### Military Health System Research Symposium (MHSRS), 14-17 August 2023

- Breakout Session: Health and Readiness Unique to the Female Active-Duty Service Woman. MHSRS-23-08356 Intended and Unintended Pregnancies: Social Determinants and Pregnancy Mental Health from a Decade of Military Research. Karen L. Weis, PhD, RNC-OB, Wenyaw Chan, PhD, Katherine C. Walker-Rodriguez, MSN, RN, Meagan Peterson, DNP, CNM, Tony T. Yuan, PhD, and Monica Lutgendorf, MD, CAPT, MC USN.
- Breakout Session: Surviving and Thriving in a Distributed Operations Environment: Military Health Challenges and Solutions. MHSRS-23-08714. High Fidelity Model for Perishable Skills Assessment in En Route Care- A Validation Study in Swine. Melissa Clemons, PhD, Maj Patrick Ng, MD, Madelaine Paredes, PhD, Jae-Hyek Choi, PhD, Steven Weeks, PhD; Kaysie Sachs, Stephanie Mdaki.
- Breakout Session: Responding to a Nuclear Event and CBRN Exposure with Resource Limitations. MHSRS-23-08765. Evaluation of Oral Dimethyl Trisulfide (DMTS) as a Prophylactic Counter Measure for Oral Cyanide Toxicity in a Swine (Sus scrofa) Model. R. Madelaine Paredes, PhD, Jae-Hyek Choi, PhD, DVSc, Heang Sundermann, MSc, Dylan Rodriguez, MSc, Kaysie Sachs, RLAT, Ryley Zapien, BS, Gary Rockwood, PhD, Vikhyat Bebarta, MD, Lt Col Joseph K. Maddry, MD, Patrick C. Ng, MD
- Breakout Session: Integrative Medicine Across Operational Environments: Acupuncture For Vasectomy Pre-procedural Anxiety and Pain Control in the Primary Care Setting: A Randomized Comparative Effectiveness Trial. MHSRS-23-08934. David Moss, M.D. Paul Crawford, M.D.



**Podium Presentations:****Military Health System Research Symposium (MHSRS), 14-17 August 2023**

- Breakout Session: Integrative Medicine Across Operational Environments: Getting Warriors Back to the Fight without Drugs. Exploration of Patient and Physician Experiences and Beliefs Involving Integrative Medicine: A Qualitative Study MHSRS-23-08940 Paul Crawford, M.D.
- Breakout Session: Clinical Studies to Advance Combat Casualty Care, MHSRS-23-08958 Mortality Benefit of Tranexamic Acid in Trauma Patients with Hemorrhage in a Resource-Limited, High-Trauma Setting. Nee-Kofi Mould-Millman, MD PhD; Smitha Bhaumik, MD; Adane Wogu, PhD; Brenda Beaty, MSPH; Bailey Fosdick, PhD; Julia Dixon, MD, MPH; Hendrick J. Lategan, MBChB, MMed; LTC Steve Schauer, DO, MS; Shaheem de Vries, MBChB, MPhil; Elmin Steyn, MBChB, MMed; Anne Ritter, DrPH, MPH; COL (ret) Sean Keenan, MD; Chelsie Fleischer, MA; Julia Finn, MPH; Christopher Collora, MS; Lesley Hodsdon, MBChB, MMed, Suzan Mukonkole, MBChB, MMed; Janette Verster, MBChB, MMed; Karlien Doubell, MBChB; Willem Stassen, PhD; COL (ret) Cord Cunningham, MD, MPH; COL Tyson E Becker, MD, MPH; Ernest E. Moore, MD; Adit A. Ginde, MD, MPH; Col. Vikhyat Bebartha, MD.
- Breakout Session: Enabling Medical Mobility and CASEVAC During Future Large Scale Combat Operations. Development of an Accelerated Extracorporeal Membrane Oxygenation (ECMO) Training Course - Evaluation of Training Modalities. MHSRS-23-09123 Lt. Col. Joseph Maddry, USAF.
- Breakout Session: Precision Medicine Research: Optimizing Warfighter Healthcare, Readiness, and Return to Duty. MHSRS-23-09687. Implementing a novel study enrollment mechanism using REDCapCloud.com within the US Air Force. Lauren Cornell, PhD, M.S., Dianna Herrera, CCRC, Katharine K. McMillan, PhD, Jennifer McDaniel PhD, LTC Luis Rohena MD, PhD, Clifton Dalgard PhD, August Blackburn PhD.
- Breakout Session: Interrupting Behavioral Health Trajectories to Sustain the Force. Comparing a Cohort of Military Psychiatric Aeromedical Evacuees to Three Large Military Comparison Groups: Opportunities and Challenges in Tackling Big Military Data. MHSRS-23-10603 Lt Col Stephanie Raps, USAF.

**Military Health System Research Symposium (MHSRS), 14-17 August 2023**

- MHSRS-23-09867 - Session 3 - #129. Evaluation of a combination antimicrobial wound cleanser and del to treat infections in a porcine combined hemorrhage/full thickness wound model. Presentation author: Dr. Kameel Zuniga.
- MHSRS-23-09204 - SESSION 1 - #467. Fitness Training and Performance at U.S. Air Force Basic Military Training in 2021. Presentation Author: Dr. Corey Kasper
- MHSRS-23-09157 – SESSION 1 - #78. A Prospective Trial of Low-Dose, High Frequency, On-Site Training to Improve En Route Combat Casualty Care Education of Emergency Physicians. Arianna Moreno, MD, Joseph K. Maddry, MD, Priscilla Garza-Quintero, Darren Hyams, MD, Sarah Goss, MD, Allyson A. Mireles, PhD.
- MHSRS-23-09163 - SESSION 3 - #7. Neutralizing Antibody Responses Are Significantly Altered Between SARS-CoV-2 Variants of Concern in COVID-19 Convalescents. Presentation Author: Dr. Alexander Burdette
- MHSRS-23-09291 - SESSION 3 - #383. Establishment of the Clinician-Scientist Investigator Opportunity Network (CSION) to Develop Military Medical Research Leaders. Presentation Author: Lt Col Joseph Maddry.

**Poster Presentations:****Military Health System Research Symposium (MHSRS), 14-17 August 2023**

- MHSRS-23-09463 – SESSION 2 - #105. Assessing polygenic risk scores for explaining variability between individuals in psychological response to traumatic events. Donna J. Millington, PhD, Dianna Herrera, CCRC, Clifton L. Dalgard PhD, August N. Blackburn PhD, Adam M. Willis, Maj, USAF, MC.
- MHSRS-23-09504 – SESSION 2 - #400. The Impact of Sleep-Focused Therapy on Sleep, Fatigue, Resilience and Psychological Health in Military Women and Men with Insomnia, OSA and COMISA. Vincent Mysliwiec, MD, Lt Col Matthew S. Brock, MD, Kristi Pruiksma, PhD, Casey Straud, PsyD, Sarah Zwetzig, PhD, Kelsi Gerwell PhD, Stacey Young-McCaughan, RN, PhD, MAJ Tyler Powell, MD, Xueying Li, MS, Alan Peterson, PhD.
- MHSRS-23-09589 - SESSION 3 - #417. Human B-Lymphoblast Mechanisms of Resistance to Shiga Toxins  
Presentation Author: Dr. Ghulam Chaudry.
- MHSRS-23-10216 - SESSION 1 - #100. Perceived Efficacy of In-Flight CCATT Training Exercises.  
Presentation: Author: Steven Weeks
- MHSRS-23-10459 \_ SESSION 2 - #356. Identifying the Neurobiology of Performance and Training Retention in Pilots via Task-based Functional Magnetic Resonance Imaging. Bianca Cerqueira, PhD; Jeremy Beer, PhD; Goldie Boone, MS; Elijah Miranda; Vincent Ho, MD; Lt Col Giovanni Lorenz, DO; Paul Sherman, MD; Tony Yuan, PhD; Lt Col Adam Willis, MD, PhD.
- MHSRS-23-10471 - SESSION 3 - #390. Cognitive and Physiologic Responses to Normobaric Hypoxia versus Hypobaric Hypoxia. Presentation Author: Dr. Bianca Cerqueira
- MHSRS-23-10581 - SESSION 1 - #453. Experiences of Clinicians Caring for Patients Receiving Continuous Physiological Monitoring in a Remote Location. Presentation Author: Lt Col Stephanie Raps
- MHSRS-23-10598 - SESSION 2 - #259. Combating the Nursing Shortage through Technological Engagement.  
Presentation Author: MAJ Enesha Hicks
- MHSRS-23-10690 - SESSION 1 - #58. Development of Absorbable Hemostatic and Antibacterial Coating for Single-Use, Sterile, Pre-Packaged, Self-Illuminating Surgical Retractor for the Forward Surgical Environment.  
Presentation Author: Mr. Vincent Proffitt.
- MHSRS-23-08081 - SESSION 1 - #466. In-Person Female Performance Multivitamin Briefing Improves Compliance and Reduces Injuries at USAF Basic Military Training. Presentation Author: Dr. Korey Kasper
- MHSRS-23-08105 - SESSION 1 - #159. Hemolysate Mixed with Crystalloid Resuscitation Reduces Fluid Requirements but May Increase Acute Decompensation After Severe Hemorrhage Unless Also Combined with Colloid. Presentation Author: Dr. Alexander Penn
- MHSRS-23-08126 - SESSION 2 - #250. Qualitative Study of Barriers USAF Pilots Face When Seeking Medical Care. Presentation Author: Capt William Hoffman
- MHSRS-23-08274 – SESSION 1 - #164. Feasibility of Endovascular Localization of Non-Compressible Torso Hemorrhage Using Swine (*Sus scrofa*): A Pilot Study. Capt Micaela Cuneo, Ashley Flinn, MD, Theodore Hart, MD, Jason M. Rall, PhD, Nola Shepard, David S Kauvar, MD, Marlin W. Causey, MD.
- MHSRS-23-08437 - SESSION 3 - #172. Evaluation of Bone Healing of Calvarial Defect Utilizing a Novel Carbon Scaffold with Bone Morphogenetic Protein-2 and Mesenchymal Stem Cells. Presentation Author: Dr. Arezoo Mohammadipoor, AJ Burdette, PhD.

**Poster Presentations:****Military Health System Research Symposium (MHSRS), 14-17 August 2023**

- MHSRS-23-08444 - SESSION 2 - #249. A Critical Gap in Addressing the Impact of U.S. Pilot Healthcare Avoidance on Medical Readiness: A Study of U.S. Aircraft Pilot Health Literacy. Presentation Author: Capt William Hoffman
- MHSRS-23-08600 - SESSION 2 - #269. Traumatic Brain Injury Increases the Subsequent Risk of Brain Cancer. Presentation Author: Lt Col Ian Stewart
- MHSRS-23-08617 - SESSION 1 - #10. Cerebral Hemodynamics Monitoring of Military Aircrew at High G: Towards In-Flight Event Detection. Presentation Author: Dr. Thibault Roumengous
- MHSRS-23-08697 - SESSION 2 - #48. Prophylactic Administration of Metformin to Evaluate Its Potential Neuroprotective Effects on Moderate Traumatic Brain Injury in a Swine (*Sus scrofa*) Model. Presentation Author: Dr. Madelaine Paredes
- MHSRS-23-08742 – SESSION 1 - #423. The Effects of Intramuscular Dimethyl Trisulfide on Improving Survival from Oral Cyanide Poisoning. Jae-Hyek Choi, PhD, DVSc, R. Madelaine Paredes, PhD, Dylan Rodriguez, MSc, Heang Sundermann, MSc, Kaysie Sachs, RLAT, Ryley Zapien, BS, Gary Rockwood, PhD, Vikhyat
- Bebarta, MD, Lt Col Joseph K. Maddry, MD, Patrick C. Ng, MD.
- MHSRS-23-08904 – SESSION 3 - #4. Pre-Pandemic Comorbidities Enhance COVID-19 Prevalence in Male Black Military Populations- A Retrospective Study. Pramod Sukumaran Pillai, Donna Millington, August Blackburn and Susana Asin.
- MHSRS-23-08907 - SESSION 3 - #179. Evaluation of Acute and Delayed Effects of the Novel Stromal-Cell Based Therapeutic, Thera-101, in Craniomaxillofacial Regenerative Healing and Angiogenesis in Rattus Norvegicus Critical Size Bone Defects. Presentation Author: Dr. Annette Rodriguez, AJ Burdette, PhD.
- MHSRS-23-08924 - SESSION 3 - #380. Comparison of Two Field Deployable PCR Platforms for Respiratory Pathogen Detection. Presentation Author: Ms. Susana Asin
- MHSRS-23-08931 - SESSION 1 - #59. Evaluation of a Ruggedized, Wearable, Regional, Oxygen Monitoring Sensor for Continuous Hemodynamic Monitoring in Swine (*Sus scrofa*) Models of Hemorrhage Shock and Moderate Traumatic Brain Injury. Presentation Author: MAJ William Davis
- MHSRS-23-08936 - SESSION 1 - #197. Delayed Administration of Bone Marrow Derived Mesenchymal Stem Cells for Bone Healing in a Rat (*Rattus norvegicus*) Calvarial Critical Defect Model. Presentation Author: Dr. Meghan Wally, AJ Burdette, PhD.
- MHSRS-23-08949 - SESSION 1 - #219. Reliability of Continuous Noninvasive Hemoglobin Monitoring in Healthy Participants During En Route Care Training. Presentation Author: Maj William Davis. Name a top 5 poster presentation out of >300 posters.
- MHSRS-23-08962 - SESSION 1 - #61. Impact of En Route Critical Care Provider Experience on Lung Protective Ventilation Compliance During Air Transport of Combat Wounded. Presentation Author: Maj William Davis

## Science and Technology Contact Information



### **Our Vision**

Grow Medical Leaders, Drive Innovations in Patient Centered Care and Readiness

### **Our Mission**

Conduct clinical studies and translational research and apply knowledge gained to enhance performance, protect the force, and advance medical care and capabilities

### **Points of Contact**

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