COMBAT & CASUALTY CARE

VOL III 2025
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PROMOTING HEALTHCARE SYSTEM ACCESS EVOLUTION

COMMANDER'S CORNER

COL Sharon Rosser
Commander
U.S. Army Research Institute
of Environmental Medicine
Natick, MA

Chief Master Sgt. Tanya Johnson
Senior Enlisted Leader
Defense Health Agency
Falls Church, VA

COL Owen L. Roberts
Program Manager
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Ft. Detrick, MD

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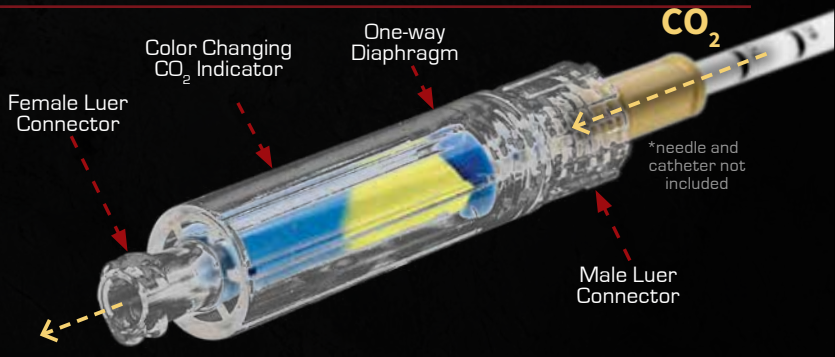

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SAFEGUARDING HOMELAND AGAINST THE SPREAD

Walter Reed Army Institute of Research (WRAIR) is leveraging its Multi-drug Resistant Organism Repository and Surveillance Network (MRSN) in response to the rise of multi-drug resistant organism (MDRO) infections reported in the Ukraine theater of conflict.

By Ramiro Chavez

Featured Interviews

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LEADERSHIP PERSPECTIVE

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FORCE HEALTH EVOLUTION

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Departments

Cover: Expeditionary Resuscitative Surgical System (ERSS) 7 prepares to put a splint on a simulated high-fidelity manikin during an ERSS course at Naval Expeditionary Medicine Warfighter Development Center last April. The scenario incorporates realistic moulage, role players, and battlefield effects to enhance trauma response and prepare medical personnel for operational deployment in austere environments. (U.S. Navy photo by Petty Officer 2nd Class Moira Francine Esquivel)

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INSIGHTS

As access to quality health care remains the perpetual goal of healthcare systems, the challenge remains no different for the men and women who support the U.S. Department of Defense Military Health System (MHS). From field combat medic to treatment facility nurse, targeted first response in maximizing patient recovery beyond combat or non-combat traumatic injury in building long-term health in the service of country and in life.

The Volume III 2025 edition of *Combat & Casualty Care* focuses on the need for continued optimization of critical connectivity between those who need care and those who can provide it. Often, that care is needed amidst environmental realities that face many servicemembers as they protect our national and coalition partner interests around the globe. In charge of DoD's largest body dedicated to the research of medical application based on environmental drivers, COL Sharon Rosser, Commander, U.S. Army Research Institute of Environmental Medicine (USARIEM) spoke with *C&CC* on current efforts to better understand stresses on human physical and mental performance brought about by the external elements of mission location. With threats to health from climate, temperature change, infectious disease, and myriad other sources, infrastructure such as the Walter Reed Army Institute of Research (WRAIR) Multi-drug Resistant Organism Repository and Surveillance Network (MRSN) exist to proactively combat the knack nature has for throwing unforeseen consequence at human vulnerabilities. One such stressor, extreme heat, is on USARIEM's radar for sensory-measured biomarker response of individual variability under differing conditions. Knowledge of likely triggers is essential to exhaustion or heat stroke prevention, critical to mission success dependent on the health of all participants, not some.

With more than 100, 000 personnel, military and civilian, supporting more than 700 military treatment facilities nationwide, the Military Health System (MHS), as Chief Master Sergeant Tanya Johnson, Defense Health Agency (DHA) Senior Enlisted Leader indicates, is the only U.S. health care system which literally "goes to war." From supporting, strengthening, and sustaining the health of those who defend the nation, modernization of the MHS as a lifeline for the backbone of country's military, its enlisted corps, is at the heart of DHA's organizational duty. From real world to simulated real world, the gap between actual and representative of actual is closing. The introduction of artificial intelligence, or AI, into military medical simulation capability is taking preparation for those learning to apply burn wound care where needed to a new level. The U.S. Army Institute of Surgical Research (USAISR) is using immersive computing to increase trainee knowledge in reducing cognitive workload, raising the likelihood that medics at point of injury will not be overwhelmed but have clarity in care application.

Be sure not to miss this edition's multiple industry perspectives and to round things out, we gain insight into why diet is so important to health, and even more so to the health of those who defend the nation.

As always, we welcome your comments and suggestions. Thank you for your continued readership!

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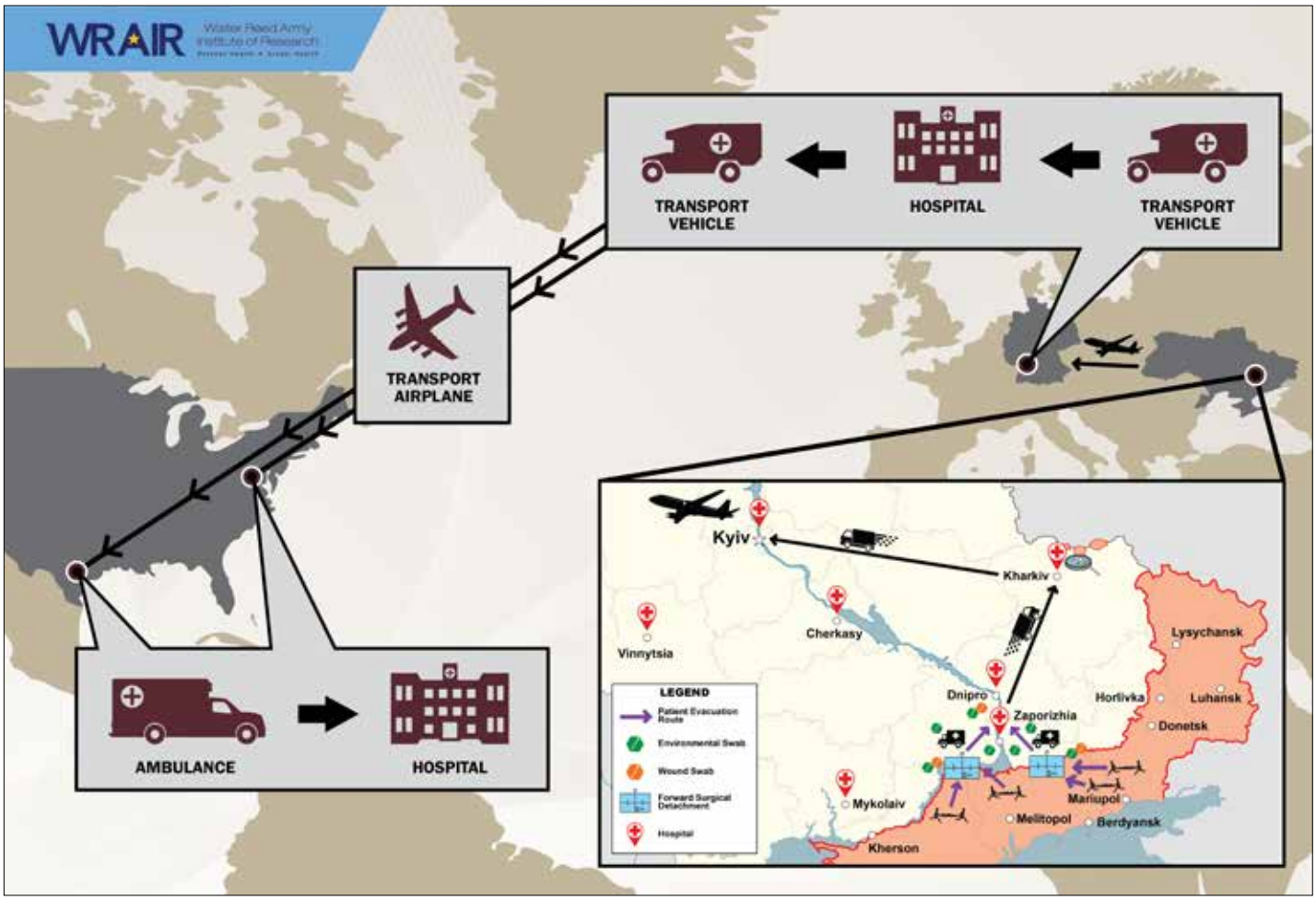
SAFEGUARDING THE HOMELAND AGAINST THE SPREAD

The current conflict in Ukraine has placed immense pressure on medical services and healthcare systems in the region. Reports from Ukraine have demonstrated a significant rise in infections caused by multidrug-resistant organisms (MDRO) further stressing a strained healthcare system.

By Ramiro Chavez, Strategic Communications Fellow, Walter Reed Army Institute of Research



The depicted patient's journey from Ukraine to the U.S. demonstrates the complex challenge of containing the international spread of superbugs. (WRAIR graphic)

In a recent study, the Multidrug-Resistant Organism Repository and Surveillance Network (MRSN) at Walter Reed Army Institute of Research (WRAIR), Silver Spring, MD, isolated six extensively drug resistant (XDR) organisms from a single soldier injured in Ukraine. The soldier suffered multiple traumatic injuries after a vehicle fire, including full thickness burns covering 60% of his total body surface area. He was initially treated in a medical facility near Dnipro, then transferred to a hospital in Kyiv for burn wound debridement, and later transported to a U.S. military hospital in Germany for further care. Using state-of-the-art genomics, the MRSN identified 24 distinct genes in just one of the six bacteria that made it resistant to every available antibiotic. "There is a risk of similar pathogens being identified as U.S. citizens return home after volunteering to aide Ukraine in its war with Russia and one of our goals is to mitigate that risk" says COL Jason Bennett, director of the MRSN. MRSN's surveillance efforts in civilian, active-duty military, and veteran healthcare systems are essential in the fight to prevent further spread.

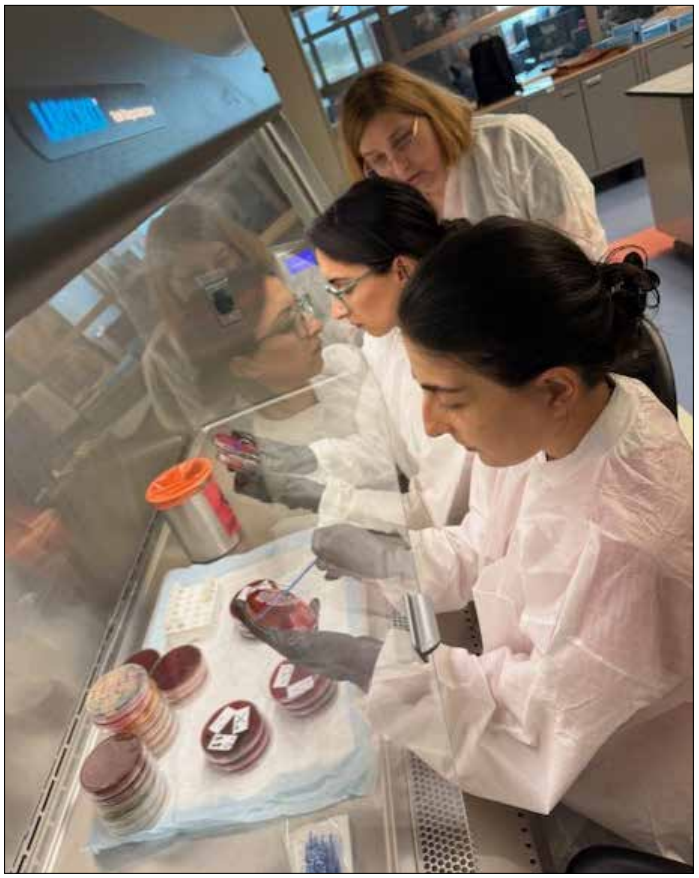
THE INVISIBLE THREAT

Antimicrobial resistance (AMR), the ability of microorganisms to resist the drugs that kill them, is a serious and growing international health security threat. These superbugs have evolved protective mechanisms that render multiple antibiotics ineffective, making infections increasingly difficult, and in some cases, impossible to treat.

Although AMR is a global concern, the U.S. military faces unique vulnerabilities. Deployments to regions with a high prevalence of AMR put servicemembers at increased risk of contracting and spreading these superbugs.

BATTLEFIELD ORIGINS

Conflict zones are a crucible for resistant infections. MDROs already present in the environment take advantage of the battlefield's high incidence of traumatic injuries and compromised health systems. Extremely resistant bacteria, like the six XDR organisms isolated from



Researchers from the Walter Reed Army Institute of Research-Europe-Middle East (WRAIR-EME) collaborate with Ukrainian scientists and the MRSN to conduct AMR surveillance and characterize bacterial isolates collected from active conflict zones in the Kharkiv and Zaporizhzhia regions. (WRAIR photo)

that Ukrainian soldier, are difficult to contain in Ukraine because of nosocomial transmission in hospitals resulting from disruptions in Infection Prevention and Control (IPC) efforts.

The lack of diagnostic capabilities coupled with a surge in patients has healthcare providers using broad-spectrum antibiotics, which inadvertently selects for resistant strains and allows them to flourish.

FROM THE FRONT LINES TO THE HOME FRONT

Servicemembers may become infected or colonized by these superbugs overseas and unknowingly introduce them into U.S. military and civilian healthcare facilities as they make their way through the healthcare system and back home.

Infections that no longer respond to conventional treatments become life-threatening when they are caused by MDROs. The complexity of treating these infections with expensive or more toxic antibiotics, combined with extended hospitalization and specialized care, all drive up healthcare costs significantly.

DEFENDING THE HOMELAND AGAINST MDROS

The MRSN collects, analyzes, and tracks MDROs to enhance infection control, guide treatment strategies, and support global health security efforts. MDRO surveillance integrated with IPC efforts within the Military Health System (MHS) enables targeted interventions to improve patient safety. The MRSN also collaborates with other federal agencies as part of the U.S. National Action Plan for Combating Antibiotic-Resistant Bacteria. The MRSN has curated collections of bacterial isolates designed to represent broad genetic and antibiotic susceptibility diversity from three different species. These panels, available for free to the scientific community, serve as critical tools enabling the study of resistance mechanisms, the evaluation of diagnostic methods, and the development of novel therapeutics.

Collaborations with GEIS, WRAIR and NMRC OCONUS labs, and medical facilities across more than 45 countries have been instrumental in establishing a robust global footprint. This extensive network has enabled the development of a comprehensive MDRO repository containing over 150,000 isolates. Such a global presence is critical for tracking MDROs worldwide, identifying emerging resistance patterns, and understanding their geographic distribution. By leveraging international partnerships, the MRSN ensures a proactive approach to combating antimicrobial resistance on a global scale.

Identifying and halting nosocomial spread in the hospital environment requires comprehensive surveillance using a reliable methodology such as genomics. "We've identified 41 possible transmission events and responded to 55 outbreak requests from MTFs in the last six months alone. The work we do is needed, relevant, and impactful," says COL Jason Bennett. Published models estimate that every $1 spent on prospective genomic surveillance saves ~$19 in the direct healthcare costs associated with hospital acquired infections, not to mention improved patient safety.

In 2022, a VA hospital reached out to the MRSN for assistance to characterize a highly antibiotic-resistant bacteria that was causing an infection that required long-term antibiotics. The organism's antibiotic susceptibility profile was highly unusual relative to typical patients the VA managed. Using next-generation sequencing and customized bioinformatic analysis, the MRSN was able to trace the origin of this bacteria back to Ukraine where the patient had previously been injured. In fact, the bacteria was genetically identical to those from other war-wounded patients in Ukraine, Germany, The Netherlands, and elsewhere in Europe. This information helped to identify the critical need for improved infection control practices during medical evacuations but also highlighted how these pathogens are able to navigate from conflict zones to stateside medical care centers.

AMR VIGILANCE

The problem of antimicrobial resistance poses a significant challenge to military readiness and operational effectiveness. Infections that are difficult or impossible to treat can incapacitate servicemembers limiting their ability to return to duty. Additionally, outbreaks of resistant infections can disrupt military operations, place a strain on healthcare resources, and compromise mission success.

The MRSN plays a vital role in safeguarding the health of servicemembers and their family members. Combating antibiotic-resistance demands unwavering vigilance and a unified approach, and the DOD remains at the forefront of this critical and challenging endeavor.

More information on the MRSN: https://wrair.health.mil

ENSURING THE FLOW FOR PROCEDURAL GO

The Morgan Lens, MorTan Inc., is a revolutionary medical device designed to assist in the treatment of ocular irrigation during emergencies, particularly for treating chemical burns or exposure to hazardous substances. The Morgan Lens can also assist in the removal of foreign bodies from the eye.

By Judy Devine, President, CEO

PERPETUAL AND PORTABLE

Developed by an ophthalmologist, the Morgan Lens is ideal for situations requiring ocular irrigation where constant supervision by medical personnel may be impractical. This makes it highly valuable in high-pressure environments such as field operations, emergency departments, and ambulance services. Its portability ensures continuity of care even during patient transport.

DEPLOYABLE AND FUNCTIONAL

The Morgan Lens can be set up in less than 30 seconds, crucial in emergency situations. The primary objective of the Morgan Lens is to improve patient outcomes and preserve vision.

Moreover, the Morgan Lens was designed to be easy to use and requires minimal training. Here is what an active-duty registered nurse had to say:

"Three Army soldiers were on their way to us following an explosion of an improvised device. The driver had goggles on and suffered extensive facial trauma and all three had eye injuries from the debris that hit them. We got bilateral Morgan Lenses in all three soldiers and flushed each with several liters of LR. Followed with antibiotics, they were rebandaged and on an emergency air evacuation that evening. These men were grateful for the care they received. The technicians and physicians here are thankful that everyone knew what to do to get the lens system set up and running. I am grateful to you for the opportunity to access the class online and the ability to present it shortly after we arrived."

Ensure that your unit is equipped with the Morgan Lens—trusted by 90% of the emergency departments in the United States.

TUNING HEALTH OPTIMIZATION FOR MULTI-ENVIRONMENT MISSION SUCCESS

Colonel Sharon Rosser is the 25th Commander of the U.S. Army Research Institute of Environmental Medicine.

Colonel Rosser is from Colton, South Dakota. She began her military career with the South Dakota Army National Guard as a combat medic. Within a year, she transitioned to active-duty Army and continued her enlisted career as a Hospital Food Service Specialist and later a Respiratory Therapist reaching the rank of Staff Sergeant.

Colonel Rosser attended the Interservice Physician Assistant Program, graduating in 2001 as a Second Lieutenant with a Bachelor of Science Degree from University of Nebraska. She also holds a Master of Science in Physician Assistant Studies from University of Nebraska Medical Center and a Doctor of Science in PA Studies with a focus in Emergency Medicine from Baylor University in 2007. She is the first military physician assistant to complete a one-year fellowship in Emergency Medicine/Critical Care Point of Care Ultrasound from 2012 to 2013 at Brooke Army Medical Center. Colonel Rosser is a graduate of Command and General Staff College–Intermediate Level Education and graduated from the Army War College in July 2023 with a Master's degree in Strategic Studies.

Colonel Rosser has served in various positions to include Battalion/Brigade PA; Emergency Medicine PA; EMPA Residency Director; Primary Emergency Medicine and Ultrasound Faculty, IPAP; Executive Officer and Director of Hospital Based Programs for the Medical Center of Excellence; Director of Comprehensive Pain Management, Office of The Surgeon General, and Secretary of the General Staff, Office of the Surgeon General. In her last assignment, she served as the Deputy Commander for the U.S. Army Telemedicine and Advanced Technology Research Center, in Fort Detrick, MD.

Combat & Casualty Care spoke recently with COL Sharon Rosser, Commander, USARIEM, regarding current and ongoing command efforts to better understand environmental stressors on human performance critical to the global U.S. combat mission.

C&CC: Why is the U.S. Army Research Institute of Environmental Medicine's mission important to warfighter health and the military mission as a whole?

COL Rosser: Human physiology and performance is the core of USARIEM's research. The human or warfighter is the number one force multiplier because it is the human who fights the war. So, our research focuses on making sure that the human is ready and at optimal performance in any extreme environment—our work directly translates to increased lethality and readiness.

COL Sharon Rosser
Commander
U.S. Army Research Institute
of Environmental Medicine
Natick, MA

USARIEM's mission is to research and deliver solutions to enhance warfighter health, performance and lethality in all environments.

There are academic, industry and defense entities that examine human performance. But what sets USARIEM apart is our deep history and close connection to the operational force. We are an S&T unit that interacts with the warfighter in their environment during our field studies. We partner with all branches of the military as well as international partners. We are fortunate to be co-located at the Natick Systems Soldier Center (NSSC) with the U.S. Army Combat Capabilities Development Command (DEVCOM) Soldier Center who make equipment. DEVCOM Soldier Center develops equipment and we're able to take the product and assess the impact on human performance during field studies. For example, a combat vest, might fit good or a combat ration might taste good—but how do these products impact human performance? We assess the impact of the products on the human/human physiology and do this assessment in the warfighter's environment. Does the new vest create slowed performance, injury? If so, this information is valuable to the developers as they refine products.

C&CC: What are USARIEM's focus areas in addressing warfighter health needs as relates to environmental factors which influence health directly?

COL Rosser: USARIEM remains focused on what we have always done best, but we are also refining our focus to stay relevant in today's world. We are still deep-diving into how warfighters perform in extreme environments—heat, cold, altitude, subterranean—and developing strategies for warfighters to keep them effective while operating in extreme conditions.

Studying nutrition is one of our focus areas because we need to continue to fuel our warfighters appropriately and without consequences. That's why we team up with DEVCOM Soldier Center. We figure out the ideal ingredients for their food, and then they bring it to life.

Another area is our performance work, specifically in our musculoskeletal injury and prevention research, which is a leading cause of disease non-battle injury (DNBI). So, whether warfighters are training or deployed, we're working to minimize injuries and speed up recovery so they can get back to their mission; directly impacting readiness.

By bringing together our environmental, nutrition and musculoskeletal expertise, we can nest these key components of performance and study the warfighter in their real-world environment. We are very efficient and effective at field studies.

This is why we do a lot of our research directly with the soldiers. It's the best way to get real answers! We learn firsthand what they need, and that shapes everything we do. Plus, we figure out what works in the field and what we can scale up. Then, we bring those insights back and zero in on those critical needs to inform doctrine, training and policy.

C&CC: What is optimizing human performance and soldier lethality all about?

COL Rosser: That is a huge question! Optimizing lethality or optimizing human performance is the idea that everyone can bring their A-game, every day whether in the office or in the field. It is easy to achieve this off the battlefield, but now you take the warfighter, and you put them, let us say, in large scale combat operations where we know that they're going to be in extreme environments, have limited resources, and operating for hours to days on end. That's where we come in. We figure out what changes we can make to their food, sleep, or gear to help them perform at their best. Our work is all about understanding how the human body reacts to the strenuous exercise and conditions, whether that be cold, heat, altitude, subterranean. If we can build algorithms and other tools to predict/detect the physiological response, then leaders can make informed decisions about who's ready to go or who needs to recover. We want our warfighters to be at their peak and stay there.

Big Picture: We are focused on the whole human aspect, pinpointing the physical needs of the warfighter, matching that to Army strategy to influence keeping soldiers ready or in the fight and if they are injured or ill or wounded, returning them to duty as quickly as possible. We directly impact both prevention and return to duty, that's how we drive optimized performance and lethality.

C&CC: What are some challenges that you see our troops facing and how USARIEM will overcome those?

The U.S. Army Research Institute of Environmental Medicine's Military Performance Division provides a Soldier with a specimen collection container during a field study analyzing the physiological and psychological responses to U.S. Army Ranger training. (Photo, Matt Bartlett, USARIEM)

As one of the five capabilities evaluated within required medical challenges at U.S. Northern Command's Arctic Edge 2024 in Joint Base Elmendorf-Richardson, the U.S. Army Research Institute of Environmental Medicine and the Naval Health Research Center carried out a joint physiological monitoring experiment. (Photo by Maddi Langweil, USARIEM)

COL Rosser: The world is changing fast. Technology is making things tougher, faster, and more complex. We're great at musculoskeletal injury research – fractures, strains, that kind of thing. But we need to figure out if there are quicker, easier solutions. Are we fueling our troops correctly to prevent those injuries when we know we might be outnumbered and need to conserve every ounce of strength?

Another thing: Cognitive performance is a crucial issue for future battles. Think about it: overburdened soldiers, long hours, limited resources, and a constantly observed battlefield. No quiet time, no space to breathe. How does that impact their ability to think, move, and communicate effectively? We have not conducted a field study under these conditions, but we will need to in order to understand the impact on performance and identify techniques to preserve cognitive performance.

Recently, I was at a conference where they talked about gratitude, and we talk about gratitude all the time in human performance optimization. Currently, we don't necessarily integrate gratitude into our programs of instruction. But what if we did? Could practicing gratitude once or twice a day offset some of the cognitive burden of a constantly observed battlefield? It might sound far-fetched, but it's worth exploring. We're also looking at algorithms to help leaders make data informed decisions. We don't want to overload the system with sensors, but if we can have tools that allow leaders to see their soldiers and enable real-time decisions about readiness, that is a game-changer. We already have products like the HIPS [Heat Illness Prevention System]. But I think that's an area where we can move a little faster.

C&CC: For the past 64 years, USARIEM has been a leader in environmental and human performance research, what tools are we using to continue as a leader in this field?

COL Rosser: One of our most powerful tools is the Soldier Performance, Health, and Readiness Database or SPHERE. It is not just a static collection of data; it's a living database that's fueling data-driven decisions. and is much more than just a data repository.

We have the unique data sharing capability and staff to be able to aggregate data from 20 or more systems of record across the Army and joint force. So, we can truly provide real time statistics to questions related to impact and return-on-investment related to program or policy changes. With that, most of those systems of record, if you have access, are written over every 30 days. For instance, our training, if I update my training in DTMS [Digital Training Management System] and I go in and enter a new date, that last date that I did it isn't there. Well, our team archives data monthly. This longitudinal information is incredibly valuable for helping Army make data-informed decisions. SPHERE is a unique capability, and we pride ourselves on our data-sharing agreements and ability to respond to Army senior leaders.

USARIEM has a great history and we're well known for our quality research, but now we are using our knowledge to transform more of our research.

While we are going to go through change, we are going to have to reshape a little bit to be compliant and prioritize the work that needs to be done protects the warfighter and to be sure that the warfighter's ready for future battles. We do have to change, but we are still making disciplined decisions, disciplined investments to make sure we can focus on the science that needs to be done.

It is an honor to be a part of and lead USARIEM especially during these challenging times and to make sure that we can continue to deliver impactful information and solutions that protect the warfighter and make them ready for tomorrow's challenges.

LITTER MODERNIZATION FOR MULTI-ENVIRONMENT MEDICAL EVACUATIONS

On behalf of Bud Calkin, CEO, Skedco, and Jim Meadows, CEO, Panakeia

In 2016, the U.S. Army Medical Research and Development Command identified a capability gap in field evacuation and pursued a new modernized design of the current Patient Rescue and Transport System and invested funding for a new concept "next generation" rescue litter. The new design would allow the litter to be compatible with existing medical evacuation (MEDEVAC) platforms, lighter than current system, improved patient security, improved patient access, fit the rucksack for Jungle Warfighters, hoist capable and be able to perform difficult evacuation procedures.

After several years of testing and evaluation, certification, (two years delay from Covid) Skedco, in coordination with the PM, USAMMDA's Rescue Litter Modernization initiative has finalized development of the "next generation" Sked litters. The litters are smaller and lighter, and straps are certified at 5000 lb. break strength. A key feature is the integrated harness that secures the patient from potential injury during high angle rescue and hoisting operations. The Rapid Extraction and Rapid Extraction (Low Profile) litters are 28 and 22. 5 inches wide verses the 36-inch-wide standard Sked. They are designed for all terrain operations, provide easier casualty access, and AWR 980 certified to be hoisted both horizontal and vertical positions.

Skedco has provided over 500,000+ Skeds to the U.S. Military and our allies for thousands of medical evacuations since 1987. The Rapid Extraction Skeds continue in line with other Skedco products that consist of the same high-quality materials. Skedco has been a key player in the Rescue Litter Modernization program.

BOOSTING THE REAL IN BURN CARE VIRTUAL REALITY

The U.S. Army Institute of Surgical Research is exploring the use of immersive computer simulations to enhance knowledge gain and reduce cognitive workload in burn care education.

by Paul Lagasse, DHA R&D-MRDC

A USAISR clinician uses a virtual reality headset and hand controllers to work through the interactive introductory burn care curriculum developed by the CRT Virtual Health team. (USAISR Public Affairs)

Future large-scale combat operations (LSCO) will likely see an increase in the number of severe burn cases that medical providers must be prepared to address. Severe burn cases are difficult to manage due to the complex pathophysiological effects they can trigger, requiring care givers to have specialized training and knowledge. However, current burn care education is not well suited to being scaled up to train large numbers of specialists who would be able to care for large numbers of burn casualties.

Burn care education is highly resource intensive and specialized. It requires educators with deep subject-matter expertise, the availability of sufficient numbers of burn patients or simulators on which to train, and enough time to gain hands-on experience in the management of these types of injuries. Military medical specialists seeking to brush up on their burn care proficiency prior to deployment may find themselves out of luck if there are no patients with appropriate wounds for them to observe, or if educators are unavailable to offer a refresher course.

Researchers at the U.S. Army Institute of Surgical Research (USAISR) Organ Support and Automation Technologies Combat Casualty Research Team, known as CRT3, are evaluating ways to use virtual reality (VR) to provide an alternative approach to burn care training that addresses these challenges. Not only that, but by allowing trainees to proceed at their own pace and repeat curriculum scenarios as needed, the VR-based training also promises to improve trainee retention of the specialized knowledge required to provide effective and timely care for severe burn casualties.

Jose Salinas

Sena Mike

FILLING THE TRAINING GAP WITH A VIRTUAL REALITY CURRICULUM

"I believe mixed reality technology, including VR, is the future of DOD medical care," says Dr. Jose Salinas, CRT3's science lead. "Right now, the focus has been on developing this technology for tactical operational environments. Our philosophy is that there is no reason why we can't also use it to optimize the care of combat casualties on the future battlefield."

CRT3's Virtual Health team is uniquely positioned to undertake the development of a training curriculum that uses VR technologies to assist military medical care providers in learning how to deliver lifesaving aid to burn patients. Collocated with USAISR's Burn Center – the only critical care, surgery, and rehabilitation burn facility of its kind in the DOD – the team can call on experienced burn surgeons, nurses, and critical care providers at every stage of the development and testing process. In addition to clinicians, the multidisciplinary CRT3 Virtual Health team includes education specialists, engineers, and researchers with experience in software development.

For the initial proof-of-concept pilot, the team opted to use Arch Virtual's Acadicus VR medical training platform because it allowed them to develop various training scenarios quickly from a "sandbox" of patient models, interactive medical equipment, environments, and even sound effects. For the VR headset and hand controllers, the team selected the HP Reverb G2 system. While the simulations are best performed using VR headsets and controllers, they can also be run on ordinary desktop and laptop computers.

"The open sandbox platform was the best way for us to do this in a timely manner and also inject our creativity for crafting a really good experience for the end user to actually learn something," says Sena Mike, a data scientist and principal investigator who leads the Virtual Health team. "We were able to inject certain capabilities that we really like, for example 'ghost' video recordings of actual clinicians who you can click on, and they will talk to you about a specific concept."

The pilot of the interactive introductory burn care curriculum uses learning objectives and content derived from the Advanced Burn Life Support (ABLS) educational program developed by the American Burn Association, with input from Burn Center subject matter experts. The curriculum consists of four standalone scenarios set in unique virtual locales:

- An introductory tutorial, in which participants are guided through basic VR functionality such as movement and how to interact with buttons, objects, and patients.
- A classroom scenario, in which participants learn about skin function and structure, differentiate between the various measures of burn depth, and describe burn wound pathophysiology, accompanied by multiple choice learning checkpoints and burn categorization exercises.
- An outdoor environment representing a field care scenario, in which participants are tasked with completing a wound mapping chart to determine the severity, extent, and total body surface area of burn wounds.
- A triage bay in a clinical setting, in which participants learn how to categorize burn severity while accounting for limiting factors such as patient load, and understand the unique characteristics of burn mass casualty scenarios.

At various points throughout each scenario, study participants were asked to complete multiple choice questions to assess their knowledge acquisition and retention. Participants also completed pre- and post-tests after each scenario and a ten-question System Usability Scale (SUS) survey to assess the usability of the software and hardware. The team also performed a NASA Task Load Index (NASA-TLX) test to assess the cognitive workload of the participants.

Jacob Rivera

Maria Serio-Melvin

Maj. Angela Samosorn

PILOT STUDY SHOWS PROMISING RESULTS

Supported by funding from the Combat Casualty Care Research Program, Mike's team developed the curriculum in a little over a year. USAISR's Burn Education team provided expertise as well as instructional content.

For the initial pilot, the team enrolled seven participants; though all were clinicians, they had little to no prior experience treating burn patients. This allowed the test team to more clearly assess their knowledge gain after completing the curriculum. Because the designers knew that participants' prior experience with using VR technology would vary, the tutorial was designed to start with the simplest interactions and progress through more complex activities to minimize the effects of such disparity. Completion time for the tutorial plus three scenarios averaged between two to three hours per participant.

When the Virtual Health team analyzed the results of the pilot study, they found that the average increase in scores between the pre- and post-tests was approximately 28% (pre-test average 45.2% ± 24.9, post-test average 73.81% ± 10.12, with a p-value of 0.012). The average SUS score across all three scenarios was 82, which is generally considered "excellent." The weighted NASA-TLX scores averaged 20.8 ± 10.1 (considered a "low" workload) for the classroom scenario, 42.5 ± 14.3 (considered a "medium" workload) for the outdoor scenario, and 23.1 ± 8.93 (considered a "low" workload) for the triage bay scenario. Overall, the VR application was found to have high generalized usability and a low cognitive burden.

The qualitative feedback was also very positive. "Participants reported that they found the experience quite useful," says Jacob Rivera, a USAISR research fellow who led the design of the training scenarios, and gave a presentation on the pilot study and outcomes at the 2025 Military Health System Research Symposium in Kissimmee, Florida. "Once they were able to get their 'VR legs,' things actually went pretty well from there. Several of them mentioned wanting to have some more procedural content, suggesting we build out the simulation from what we started with, which was really encouraging."

VIRTUAL HEALTH TEAM LOOKS TO FUTURE DEVELOPMENT POTENTIAL

Having successfully demonstrated that an interactive, VR-based introductory burn care curriculum can increase knowledge gain and reduce cognitive workload, while also permitting care givers to engage in the training at any time or location and repeat it as often as desired, the CRT Virtual Health team is turning their attention to opportunities for continued improvement. Ultimately, they would like to incorporate participant feedback into the curriculum and develop additional scenarios for other essential burn competencies. The team also believes that the curriculum could help care givers who have never seen burn injuries to prepare themselves better for the reality of seeing and working with burn casualties in the real world.

"We have a lack of exposure to seeing burn patients in the Military Health System, so for someone to be seeing a burn patient for the first time in a deployed environment is very stressful," explains Maria Serio-Melvin, the deputy chief of USAISR's Clinical Research Support Department. "What VR does is give clinicians of all different backgrounds a safe space in which to gain some exposure to what a burn patient might look like and what they would be expected to do to try to save their life or limb, or both."

Maj. Angela Samosorn, USAISR's nurse scientist, says that as the use of virtual, mixed, and augmented reality technologies become more widespread, and as the technologies themselves improve, the different systems will begin to sort themselves into categories based on the types of activities for which they are most optimized.

"These technologies are not all created equal, in that they're not all meant for the same type of learning outcome or learning pathway," says Samosorn. "When you look at what VR is best used for right now, it's decision-making and getting you to think through content and develop an understanding of what goes into taking care of a burn patient. For more task-based skills, it's just not there yet. As the technology continues to develop, knowing when to use which technology for a particular intended outcome is what is important."

That knowledge is something that the CRT3 Virtual Reality team is well positioned to help military health care providers develop and refine, as demonstrated by the results of the burn care curriculum pilot study.

"Our group is not simply deploying new technologies just for the sake of doing it, we're doing research that answers questions like, Does this actually make a difference? Are people actually learning from this? How does augmented reality affect clinical performance?" Mike questioned. "We don't want to just give Warfighters a piece of technology if it really doesn't make much of a difference. We do the research to back up our data-driven results to make sure the technology will actually help people do their jobs better."

REDEFINING ADVANCED WOUND THERAPY

Smith+Nephew, a medical technology company focused on the repair, regeneration, and replacement of soft and hard tissue, has secured a single award Electronic Catalog contract (ECAT #SPE2D1-25-D-0005) to provide Negative Pressure Wound Therapy (NPWT) systems in support of the Department of Defense's mission to protect and preserve the lives of all warfighters and beneficiaries.

By Vincent Fath, SVP/GM, US AWM Commercial Smith+Nephew

The RENASYS TOUCH tNPWT System has demonstrated clinical efficacy (Smith+Nephew 2018; Forlee et al. 2018; Wounds International 2020; Frear et al. 2020) and operational fitness, including portability (Forlee et al. 2018), an intuitive interface (Forlee et al. 2016; Smith+Nephew 2016a; Smith+Nephew 2016b), and the ability to provide a range of therapy modes, set points, and cycle times that allow individualized patient care.

RENASYS TOUCH NPWT with the use of RENASYS Soft Port technology is simpler and quicker to use than hard port alternatives, the RENASYS Soft Port can be applied and removed with minimal pain in even the most difficult-to-treat contours of the body for an improved patient experience (Smith+Nephew 2012, Carnali M etall 2016). Soft Port saves time and resources when applied to awkward areas of the body, and may help reduce the need for complex bridging (Carnali M etall 2016, Hudson D etall, 2013).

RENASYS TOUCH NPWT can support military medical providers in administering therapy through prolonged casualty care, first surgical intervention, aeromedical transport, and definitive care in military treatment facilities.

"Future conflicts will be more difficult and complex. This implies medical devices and treatments will need to be simplified and more intuitive to be used further forward by a wide range of providers. RENASYS TOUCH NPWT will provide that simplified negative pressure wound therapy solution to the military care continuum for warfighters who need it most," said Dennis Lyons, MSG (ret.), SO-ATP and Sr. Director Military & Federal Health for Smith+Nephew.

FURTHERING ON PROVEN METHODOLOGY

Smith+Nephew has a longstanding history of supporting military medical needs, beginning with the First Field Dressing dating back to World War I. This legacy continues to evolve, meeting the growing needs of both civilian and military healthcare providers and patients. Today, our commitment to innovation in wound care continues through an extensive Advanced Wound Management portfolio designed to meet complex clinical needs and help healthcare providers reduce the human and economic consequences of wounds (Forlee et al. 2018).

RENASYS TOUCH System is part of our full negative pressure wound therapy portfolio designed to meet your patients needs where they are. Including our post-acute RENASYS EDGE Traditional Negative Pressure Wound Therapy System and PICO Single Use Negative Pressure Wound Therapy System.

Smith+Nephew

RENASYS◊ TOUCH
Negative Pressure Wound Therapy System

Shaping what's possible in military woundcare since 1914

Smith+Nephew has secured a single award Electronic Catalog contract (ECAT) # SPE2D1-25-D-0005 to provide Negative Pressure Wound Therapy (NPWT) systems in support of the Department of Defense's mission to protect and preserve the lives of all warfighters and beneficiaries.

Stop by **booth #500** during the 2025 Military Health System Research Symposium (MHSRS) to to learn more.

EMPOWERING MEDICAL PROFESSIONALS TO SUPPORT A GLOBAL HEALTH MISSION

Chief Master Sgt. Tanya Y. Johnson is the Senior Enlisted Leader for the Defense Health Agency in Falls Church, Virginia. Prior to her current position, Johnson was the Senior Enlisted Leader for the Director of Staff at the DHA. Johnson entered the Air Force as an Airman Basic in October 1993. She graduated Medical Laboratory Apprentice Technical Training Course in December 1994. Her background includes various positions as a Clinical Laboratory Technician, Protocol Assistant for the 375th Airlift Wing Commander, and the Executive Assistant to both the Aeronautical System Center and Air Education and Training Command, Command Chief Master Sergeant. Johnson has deployed in support of Operation United Assistance, Operation Inherent Resolve, and Operation Deliberate Resolve. Her awards include the Meritorious Service Medal with seven oak leaf clusters, the Air Force Commendation Medal with three oak leaf clusters, Meritorious Unit Award, Air Force Outstanding Unit Award with two oak leaf clusters, Air Force Organizational Excellence Award, Armed Forces Service Medal, and the Military Outstanding Volunteer Service Medal. She is an honorary member of the Army Medical Department Order of Military Medical Merit.

Chief Master Sgt. Tanya Y. Johnson
Senior Enlisted Leader
Defense Health Agency
Falls Church, VA

Combat & Casualty Care had the pleasure of speaking with Chief Master Sgt. Tanya Johnson, Defense Health Agency Senior Enlisted Leader, regarding the role of enlisted medical servicemembers in support of the Military Health System and the future global fight.

C&CC: Can you give our readers a brief overview of the Defense Health Agency?

CMSgt Johnson: The Defense Health Agency is an integrated combat support agency striving to make people's lives better by improving health and building readiness in support of our warfighters and delivering health care to our 9.5 million beneficiaries.

Our global team of more than 100,000 civilians and military personnel support more than 700 military hospitals and clinics in the Military Health System (MHS), one of the nation's largest health care institutions. The MHS is the only U.S. health care system that goes to war. That means readiness is imperative, as is supporting our warfighters, sustaining their skills, and strengthening our chain by evolving and modernizing the health care system to improve access, quality, and safety.

We're also one of eight combat support agencies in the Department of Defense tasked with supporting the military departments in their combat operations. We run a complex mission delivering health, dental, and veterinary care, health surveillance, medical research, and medical education and training, along with managing the Armed Services Blood Program, the Joint Trauma System, and the Armed Forces Medical Examiner System. Through the TRICARE Health Plan, we provide health and dental plans, special programs, and prescriptions to uniformed service members, military retirees, and their family members at our military hospitals and clinics as well as civilian health care facilities.

C&CC: Can you explain the role of the Defense Health Agency Senior Enlisted Leader and how it supports the DHA mission?

CMSgt Johnson: The DHA Senior Enlisted Leader (SEL) provides enlisted oversight, leadership, and strategic guidance to general officers, flag officers, and senior executive service leaders on everything from executing our combat support activities to policy development, regulations, and healthcare delivery across the MHS.

The DHA SEL also coordinates with other SELs in the military departments, combatant commands, and military services' surgeons general to ensure everyone is aligned in support of the Department of Defense priorities. It's an important advisory role—all SELs are the link between enlisted service members and commanders; or, in my case, the DHA Director. It's up to me, with the support of other

Air Force Airman 1st Class Tyler Devlin demonstrates patient treatment at the Medical Education and Training Campus at Joint Base San Antonio, Texas, June 8, 2015. (DoD News photo by EJ Hersom)

U.S. Air Force medics take part in a mass casualty training scenario during the 16th Annual Medic Rodeo exercise at Cannon Air Force Base, New Mexico, May 15, 2025. Second sentence (U.S. Air Force photo by Airman 1st Class Gracelyn Hess)

Agency SELs, to ensure the DHA Director's vision is understood and implemented.

As far as how we support enlisted personnel, it's my job to be a staunch advocate for every enlisted service member assigned to DHA. One of the most important things any senior leader can do for their team is listen with an open mind to the challenges they're facing, then do everything possible to remove barriers.

It's also imperative the DHA SEL ensure everyone has the tools they need to get after our military medical mission. That means providing opportunities for joint medical training, encouraging professional development, working with military hospitals and clinics to ensure all medical enlisted are operating at their full scope of practice, and maintaining open communication at every level of the organization.

One aspect of the SEL role I enjoy the most is fostering camaraderie and working to improve staff morale and wellbeing. When I came into this role almost three years ago, I promised to build a culture of trust, mutual respect, and cooperation. That's why my leadership philosophy is TEAM: T for transparency; E for empowering people to be their best selves; A, a promise to hold people accountable and be held accountable; and M for making a difference. My time as the DHA SEL has been one of the most rewarding experiences of my career.

C&CC: In what way do Enlisted medical personnel support MHS mission goals?

CMSgt Johnson: Enlisted personnel are the backbone of our military. They're responsible for day-to-day operations, executing orders and carrying out mission-related tasks necessary for our success. At DHA, medical enlisted personnel are a critical part of how we deliver care to almost 10 million people while providing medical support to the military departments comprising the greater MHS. The depth and breadth of their knowledge, skills, and expertise cannot be overstated. Basically, medical enlisted are adept at being adaptable.

In our military hospitals and clinics, our enlisted personnel perform hands-on patient care, assist health care professionals in a wide variety of scenarios, manage healthcare administration, and oversee resourcing and logistics. They perform emergency dental treatments, construct dental crowns and bridges, process dental X-rays and operate X-ray equipment. They serve as operating room technicians for general and specialized surgeries, handle preventive care and administer medications and immunizations, conduct physical exams, treat diseases and injuries, maintain patient

U.S. Air Force Chief Master Sgt. Tanya Y. Johnson speaks during a 2024 event recognizing the 11th anniversary of the establishment of the DHA. Johnson thanked the DHA workforce for their dedication to the mission of caring for patients in the Military Health System. (DHA)

records, and perform research. They specialize in radiology, rehabilitation, phlebotomy, dental, surgery, family medicine, pathology, women's health and more.

On the battlefield, enlisted medics are first responders, quickly assessing, treating, and stabilizing casualties at the point of injury. That includes things like controlling bleeding and managing airways, as well as identifying life-threatening issues that require immediate attention, communicating with medical personnel at higher levels of care, documenting treatment, and prepping for evacuation. Each step is crucial for survival, and enlisted personnel are involved at all levels of care. In the operational environment, a corpsman or medic is often called "doc" because they may be the only medical professional around, sometimes for hundreds of miles. In our world, that can mean the difference between life and death.

C&CC: What are some of the challenges facing enlisted medical servicemembers in the current environment and what is DHA doing to address those challenges?

CMSgt Johnson: I know we say this a lot, but health care is at an inflection point. The pace of change in medicine is astonishing, between staffing shortages, the intersection of data and technology, artificial intelligence, and a strong push toward patient-centered care. Change can be difficult to navigate, and medical enlisted personnel must balance their medical duties with their operational requirements, training, and readiness. Enlisted personnel are under a tremendous amount of pressure, and the demands on their time can make it difficult to practice self-care, not to mention the stress of adapting to the evolving nature of warfare. Burnout is real and there's still a certain amount of stigma around asking for help. This makes it difficult to take care of their own health and well-being while caring for others. Both DHA and the Joint Services recognize the need to address these challenges.

Our medical enlisted also tell us they need more hands-on training at our military treatment facilities where they sometimes feel relegated to non-medical roles or roles they feel do not help prepare them for a future fight. This is exacerbated by disparities in civilian healthcare training opportunities for the enlisted force compared to officers. Obviously, this is a valid concern, especially when we rely on combat medics and corpsman at the point of injury. It's imperative we strike a balance, ensuring our medical enlisted not only receive the necessary training but have an opportunity to put that training into practice. There's simply no other way to ensure full medical readiness in support of a Military Health System that relies on our enlisted professionals.

MAXIMIZING METHOD TO CHEAT THE HEAT

Across the U.S. military, servicemembers train every day to prepare for battle, knowing the possible risks. One of the major non-combat threats to the military is exertional heat-related illness and injury. The U.S. Army Institute of Environmental Medicine works on solutions to this potentially deadly reality every day.

By Maddi Langweil, USARIEM

Heat-related illnesses and injuries such as heat stroke and heat exhaustion can take a servicemember out of operations during both training and in real-world military activities. During the 2021 Best Squad competition in Schofield Barracks, HI, servicemembers in the 25th Infantry Division participate in strenuous exercises in the tropic conditions. (Photo by Spc. Jessica Scott)

U.S. Army Research Institute of Environmental Medicine (USARIEM) researchers dedicate themselves to understanding human physiological responses to working in the heat, including the importance of both physiology and biophysics to these responses.

"Soldiers or other warfighters out in training or deployed are in a lot of situations where they can be exposed to extreme heat, but they still need to perform at a high level," says Nisha Charkoudian, Ph.D., Chief of the Thermal and Mountain Medicine Division at the USARIEM.

The occurrence and intensity of heat waves is increasing—leaving a more frequent and lasting impact on our susceptibility to heat-related injuries and illnesses, Charkoudian continues.

Heat-related injuries can threaten the success of a mission regardless of the severity. Exertional heat stroke, the most severe, requires immediate response and hospitalization. Heat exhaustion, while a milder heat injury, requires training cessation and medical attention.

"Over 400 U.S. military personnel have an exertional heat stroke every year, which is the most severe form of heat illness and can be fatal. Over 2,500 experience mild or moderate illness in the form of heat exhaustion and heat injury," says Gabrielle Giersch, Ph.D., Research Physiologist at USARIEM.

"To help servicemembers prepare to avoid heat illness and continue the mission, Charkoudian says, "we need to know what is going on within the human body with regard to how best we can prepare our soldiers or really any human exerting themselves in extreme environments."

LEVERAGING KEY BIOMARKERS AND ALGORITHMS

When experiencing an exertional heat injury, body temperature and heart rate increases, and a person can feel increased fatigue or dizziness. If the person does not stop for treatment, the illness can progress to increased feelings of confusion, muscle cramps, fainting and/or vomiting. The speed of medical intervention determines the life-threatening potential of such cases.

"I've seen people go down first-hand," says LTC David DeGroot, Ph.D., Director of the Army Heat Center at Fort Benning, Georgia, and USARIEM heat research partner. "I remember observing the event First 100 yards, which is the very first event of basic training, when a soldier was struggling to continue. He took a knee, vomited and had the typical signs and symptoms of a possible heat illness casualty."

"In general, heat casualties tend to go back to training after a couple of days or, in the case of a heat stroke, several weeks of recovery," DeGroot added.

With over 70 academic, government and private industry collaborations, one of the Institute's more recent collaborations with the Army Heat Center involves understanding the influence of

individual variability in biomarker response to exertional heat strokes. The use of biomarkers to measure the human's current condition is not new, but unlike other facility capabilities, the research was done directly with the military personnel in Fort Moore, GA, and enabled the team to study the population on an individualized level. This, in turn, helps to identify what makes heat illness casualties unique and may eventually support the development of possible algorithms for wearables and technological deliverables to optimize the whole force from an individualized level.

ENTER THE HEAT ILLNESS PREVENTION SYSTEM

The Heat Illness Prevention System (HIPS) is a next-generation technology that provides unit leaders real-time visibility into a service member's heat illness risk while in the field. The heat injury risk monitoring wearable sensor system employs three government-owned algorithms for estimated body temperature, gait instability and heat strain (adaptive physiological strain index). Researchers developed the HIPS to address the inability to predict and avoid heat injuries; as of 2024, over 14,000 servicemembers have used it during high-risk training events, saving at least two warfighters' lives.

Each heat-related injury or illness affects the health and readiness of the soldier and unit. An investment in heat illness prevention research not only saves lives and optimizes health but can also reduce healthcare costs. Because, when a soldier suffers a heat stroke, for example, it can cost between hundreds to thousands of dollars depending on recovery and loss of duty time.

"Since deploying HIPS in the field, we have found a more than 50% decrease of exertional heat illnesses and an average 39% increase of such illnesses when the system was not used," says Mark Buller, Ph.D., Principal Investigator of the study and Research Physiologist at USARIEM.

The tool continues its testing and is being used this year during events such as the Best Ranger Competition in Fort Benning, the Best Sapper Competition at Fort Leonard Wood and the Recon Challenge with the Marine Recon Training Company at Camp Pendleton.

"It's about the troops, but on an individualized technological-advanced level," Buller says.

DETERMINING RISK AND MINIMIZING THE DANGER

In continuing to advance heat research, USARIEM scientists are studying individualized risk factors for exertional heat illness to help identify situations or characteristics that put people at increased risk.

A 2024 award-winning study looks at the ratio of body surface area to body mass can dictate how well humans dissipate heat to the environment during physical activity. In individuals with a smaller ratio of body surface area to body mass, this ratio is higher, meaning they have more surface area to dissipate heat relative to the amount of muscle that generates heat and may have a lower risk of developing heat illness, in certain environmental conditions, when they are exercising in their physical training uniform.

With studies like this, leader decision-making and policy guidelines are more strategic with the health of the service member in mind.

Besides general body size, another individual risk factor that contributes to being vulnerable to a heat-related illness is extreme motivation.

"Soldiers are incredibly motivated, which in some conditions, that motivation can be considered a risk factor for heat-related illness," Giersch says. "When servicemembers complete operational exercises such as ruck marches, many find themselves pushing to exceed expectations but also exceeding what their body can reasonably maintain."

Researchers at USARIEM have shaped useful life-saving deliverables like the Heat Illness Prevention System (HIPS) through years of research heavily focused on unexplored areas of concern. USARIEM began validating new efforts to help the servicemember and inform policy for more than half a century to help servicemembers. (Photo by Maddi Langweil, USARIEM)

Providing our servicemembers with knowledge and best practices to accomplish their mission safely is a must, Giersch says. Pushing beyond the limits of health and safety is a factor that leads to dangerous levels of heat illness in training.

Giersch and Charkoudian explain that one of the best preventive tools is heat acclimation, which is the physiological process by which the body adapts to heat exposure after repeated exposures to the heat. Within 10-14 days, the thermoregulatory mechanisms will become more responsive and efficient, decreasing the risk associated with exercise in the heat.

"It's actually incredible to see these adaptations with systematic exposure to the heat," Giersch says. "However, being adapted does not mean that you won't succumb to a heat illness. You can still have a heat illness, being completely and fully adapted to heat stress, so that's a really important distinction because we still see cases happen despite being in those hot regions for months."

REACHING TOWARDS A FUTURE OF PROTECTION

USARIEM continues to push forward, utilizing current knowledge and tools, as we find answers to protect servicemembers and get them back on their feet quickly and safely, as well as improving knowledge of how environmental conditions impact human performance and lethality.

"By continuing this work, we can potentially prevent heat illnesses and make more enhanced treatments so that individuals can return to duty more successfully and faster with fewer long-term ramifications," Giersch says.

Heat research isn't just about the science—there are also social, economical and health consequences that could create wider existing inequities. USARIEM is taking preexisting, essential data and making it into timeless revolutionary work through the power of today's emerging tools as previously outlined.

"We need to continue our research to figure out how to mitigate risk of illness and speed up return to duty after illness from extreme environments. Our current training and future operational environments will occur in more extremes of heat and cold," Charkoudian says.

A NEW PARADIGM IN WOUND CLOSURE

DermaClip US, LLC manufactures DermaClip® Skin Closure Devices, an innovative technology with National Stock Numbers (NSN) and carried on the Distribution and Pricing Agreement (DAPA), Electronic Catalog (ECAT), and Federal Supply Schedule (FSS).

By Charles Darling, CEO, DermaClip® US, LLC

Sutures are ancient, having been used to close wounds for thousands of years. It is time to give the modern warfighter modern wound closure – DermaClip® Skin Closure Devices.

Compared to sutures, needle-free DermaClip devices allow any provider to deliver high-quality, long-duration closures quickly and consistently. And no percutaneous wounds mean fewer infection pathways and no lidocaine.

The secret lies in the devices' technology. They are designed to maintain wound approximation and evert the skin edges on every closure – all textbook elements of good closure – without forceps or needle drivers. All the provider does is apply the devices to the approximated edges of the wound and pull the devices closed. The devices do the rest.

As a result, providers can be taught to use DermaClip devices proficiently in minutes, and wounds can be closed in seconds, facts compellingly demonstrated in an approved cadaver study at Ft. Hood. After only 15 minutes of training, providers closed 6 cm wounds with DermaClip devices in an average of 77 seconds—600% faster than sutures (456 seconds).

MULTI-MODULAR FOR ADVANCED SURVIVABILITY

DermaClip devices integrate across all Roles, providing triage, interim or permanent closure, all with no skin damage. This vertical integration empowers units with internal resupply, fewer medical consumables, and lighter medical loads.

The devices are weight saving: a package delivering three inches of closure weighs only 0.15 oz. and is the size of an index card; a waterproof kit with 12 packages delivering 3 feet of closure weighs just 2.5 oz. This means the devices can be included in any kit, reducing weight without sacrificing capability, and are air droppable.

With no need for lidocaine, needle-drivers or forceps, additional weight savings can be realized.

By reducing closure time, the devices enhance the capabilities of the medical provider, improve warfighter survivability, and return non-disabled warfighters to service faster, aligning with the goals of Prolonged Field Care.

DermaClip® devices are not just closure devices. They are a force multiplier, making any unit lighter, faster, more lethal – and more survivable.

SPURRING INNOVATION TO DELIVER JOINT FORCE MEDICAL SOLUTIONS

U.S. Army Col. Owen L. Roberts assumed leadership of the newly established Operational Medical Systems Program Management Office in early 2025. As part of the Defense Health Agency, OPMED acts as the DoD's leading force in medical development and acquisition, working to enhance Warfighter lethality and readiness. The project managers on his team develop and deliver next-generation, world-class medical capabilities that empower combatant commanders for Large-Scale Combat Operations, especially in austere environments. Their mission focuses on two key objectives: saving lives on the battlefield and quickly returning injured service members to duty.

Combat & Casualty Care recently spoke with COL Owen Roberts, PM of the newly created OPMED PMO, to gain insight into the dynamic capabilities OPMED brings to the table, how the team's mission is evolving, and what his team is doing to support the U.S. Joint Force.

C&CC: Changes are rapidly occurring across the DoD. How is the OPMED team managing these changes while continuing its mission to support Warfighters?

COL Roberts: We operate in a very dynamic environment, and we continue to evolve to better meet the needs of leadership within the Department of Defense and our partners in the Joint Force. That said, our focus and our mission haven't changed: we remain the DoD's premier medical development and acquisition experts, laser-focused on supporting the medics, corpsmen, and medical officers in the Army, Navy, Air Force, and special forces.

Whether we're managing a product, device, treatment, or project, each begins at a different point in the development process. However, our ultimate aim remains constant: to provide our military end users with the vital tools they need to save lives during Large-Scale Combat Operations and return injured service members to duty.

These priorities are what we focus on, as individuals and as a team, because it is what the American people expect from military medical providers. We will continue to innovate, improve our processes, and refine our approach to deliver the best medical capabilities available to the Joint Force. In the end, it's all about improving Warfighter readiness and honing Warfighter lethality for tomorrow's wars.

C&CC: What are some of the core focus areas for OPMED as we head toward 2026 and beyond?

COL Roberts: First, we are working to streamline and improve the processes that directly support the medics and medical officers at the front lines. For OPMED, that means making some tough choices to better apply our resources toward projects that address a current capability gap and are most beneficial to end users in a time- and resource-constrained environment.

COL Owen L. Roberts
Program Manager
Operational Medical Systems
Program Management Office
Defense Health Agency

Second, we continue to focus on Warfighter readiness and lethality. Our project management portfolios – blood products, brain health, expeditionary medicine, rapid diagnostics, and force health protection, to name a few – are all tailored to meet the needs of medical providers at and near the front lines. Our goal is to develop, acquire, and field the tools that improve readiness at the operational level and increase lethality at the tactical level – as rapidly and cost-effectively as possible.

We are mindful that 2026 (and, for that matter, the years to come) is not a finish line, but a benchmark. The key to our success is to continuously develop the devices, treatments, and capabilities that will meet the needs of the DoD and the military medical community.

C&CC: How is OPMED expanding its scope to meet the needs of that broader DoD medical community?

COL Roberts: That's a great question, and the answer is twofold.

One, we have a much wider aperture now that we have realigned to the Defense Health Agency. Our stakeholders are no longer primarily within one service, as was the case when we existed as part of the

Department of the Army. OPMED's projects and portfolios must be necessarily broad to meet the needs of the individual services, but also tailored to meet the specific needs of medical providers at the front lines, regardless of the color of their uniforms. It is a new challenge, but one that we are particularly well-suited for, given the reach we have within the DoD.

Two, we are very proactive in our outreach, while remaining flexible and responsive to urgent needs. For example, just this Spring, we participated in two Joint Force, international, U.S.-led exercises in the Philippines and Lithuania. We met with and supported key stakeholders in the Indo-PACOM and European combatant commands during Balikatan 25 and DEFENDER 25, respectively. These were premier events that both raised awareness of our mission and gave us a much better understanding of the challenges end users face in tactical, austere environments. Moreover, we can and do routinely support the urgent needs of the Joint Force, up to and including the White House medical staff.

C&CC: Why is it important to have a medical development organization like OPMED, especially given the DoD's focus on Large-Scale Combat Operations in austere environments?

COL Roberts: I ask myself that question frequently, and the answer drives my mission mindset: OPMED is the avenue for generational advancement within the U.S. military medical community – and we cannot, and will not, fail in that mission.

The projects we manage for the DoD are designed for worldwide use tomorrow, and for at least a few generations to come. From beachheads in the Indo-Pacific to military treatment facilities in the United States, the capabilities we are developing now will someday be in the hands of medics who haven't even been born yet in 2025.

We take that responsibility seriously, because we don't know what the future holds – but we will work tirelessly to make sure our partners in the Joint Force are as prepared as possible for the next war, wherever and whenever it happens.

C&CC: How do you and the OPMED team measure success?

COL Roberts: This comes down to our priorities: Driving innovation in the medical development space; rapidly developing medical solutions for service members; enabling Warfighter readiness and increasing lethality; and managing proactive partnerships inside the DoD and with industry to deliver functional and fieldable technologies and treatments as quickly as possible.

We measure our success by meeting those objectives on a daily, monthly, and quarterly basis, because that is what our Warfighters need and what the American people deserve: medical solutions that not only save lives but also enhance the DoD's ability to fight and win anywhere in the world.

C&CC: What are some of the challenges on the horizon, and how is OPMED working to mitigate them?

COL Roberts: This is indeed a challenging world – we see it every day and at every turn. The U.S. is center stage in addressing regional conflicts across several combatant command areas of responsibility in real time. The challenge that OPMED faces, as the DoD's premier medical development organization, is to increase the speed of delivery while outpacing the technological innovations of our adversaries. We do not have the luxury of embarking on projects that take a decade – the threat environment is evolving far too rapidly for old paradigms.

We address these challenges every day in very deliberate ways. First, we are conducting an expedited and thorough review and assessment of the high-impact programs that meet the immediate needs of Warfighters: blood replacement, oxygen delivery, and combat trauma treatment, to name a few. These lifesaving capabilities are the highest priority for frontline medics and medical organizations at Role 1 (field treatment) and Role 2 (forward support) levels of care.

Second, we are developing stronger ties with end users across the Joint Force to focus on efforts that will yield the greatest return on investment in the shortest time possible. Our project managers routinely meet and engage with the stakeholders who rely on our development expertise. They, in turn, provide invaluable feedback to help our teams refine their processes and quicken the pace of development. It's all about reaching milestones, securing FDA approvals, and transitioning new products for fielding to make the biggest impact.

Third, we remain acutely aware of conflicts happening across the globe. The DoD has worldwide reach and influence, and at literally any moment, American Soldiers, Sailors, Airmen, and Marines can be called to action, anywhere around the world. At OPMED, our core mission is to develop medical solutions that are functional and fieldable today, in support of our Warfighters. And the team we have in place is ready to deliver.

BALANCING THE MOST CRITICAL COMBAT FUEL

The U.S. Army Research Institute of Environmental Medicine is implementing a tool which deepens an understanding of how diet can affect the behavior of military personnel on the battlefield.

By Maddi Langweil, USARIEM

Servicemembers train and deploy in unique environments which affect food availability and timing of meals, as well as health and readiness. (Photo by Spc. Benjamin Tomlinson)

There is a new tool for the U.S. Armed Forces to conduct nutrition research and accelerate interventions—the Military Eating Behavior Survey, known as MEBS, is an assessment developed by the U.S. Army Research Institute of Environmental Medicine that measures eating behaviors and factors influencing those behaviors in military populations.

"The MEBS is tailored to our military population to help researchers and clinicians better understand factors contributing to how and what servicemembers eat," said Phil Karl Ph.D, a Nutrition Physiologist and Registered Dietitian in the Military Nutrition Division at USARIEM.

Dr. Phil Karl

CAPTURING FACTORS NEVER HOLISTICALLY CONSIDERED

According to Karl, the research, which was led by previous USARIEM research dietitians, COL (ret.) Renee Cole and LTC Julianna Jayne, alongside a broader multidisciplinary team, was motivated by a critical gap: "no existing survey sufficiently captured the complex psychological, environmental and behavioral factors influencing eating behaviors in military personnel. Servicemembers often face unique environments and requirements that affect food access, eating patterns, and ultimately, health and readiness. These conditions can be distinct from civilian populations, necessitating development of a military-specific tool," Karl said.

Previously, military researchers and clinicians had been reliant on civilian-centric nutrition and behavior surveys that do not always account for the unique influences of military environments and culture on eating behaviors and dietary intake.

Nutrition influences physical performance, mental function, weight status and overall health and military readiness. To improve diet, health and performance, it is important to answer questions about eating behaviors and the factors influencing those behaviors.

Eating behaviors, or how and what one eats, can be affected by many factors, such as stressful operational environments, poor sleep, unpredictable future requirements, pressures related to body composition and physical fitness standards, and high physical demands. The circumstances and combinations in which these factors are experienced can be unique to military servicemembers. Therefore, tools aiming to identify how those factors interact to influence behavior and food choice need to be developed with a military focus.

For example, do military training environments promote development of desirable eating behaviors that lead to improved diet quality or undesirable behaviors that contribute to overeating? What environmental factors or military requirements are associated with healthy or unhealthy dietary patterns? Answering questions like these can give researchers and practitioners insight into devising new strategies to improve the eating habits and diets of military personnel.

MEASURING INDIVIDUAL BEHAVIOR FOR FORCE-WIDE RECOMMENDATION

An important component of the MEBS is a brief 7-question screener called the Healthy Eating Score (HES). The HES provides a field-expedient measure of diet quality that can be used by soldiers, leaders and healthcare providers to quickly assess overall quality of the diet. Monitoring changes in diet quality over time may provide these groups with insights regarding needs for dietary intervention and with a tool to look at the effectiveness of those interventions. Given the integral role of nutrition in warfighter health, such simple tools may ultimately prove useful on the battlefield by helping to improve readiness and resilience.

"High quality diets provide a foundation for optimal health and performance," Karl said. "However, we don't always realize that our diets are suboptimal. Having tools that can provide quick, immediate feedback can help soldiers realize and maintain healthy eating goals." After combing through dozens of questionnaires and piloting 250 test questions on over 1,500 soldiers, the Military Nutrition Division team settled on 133 questions for the MEBS, which can be completed in 30-40 minutes.

"The MEBS includes multiple sub-scales, which allows users to select only part of the questionnaire to use if needed," noted

LTC Bridget Owens, Research Dietitian at USARIEM. "If researchers wanted to measure only nutrition knowledge, emotional or situational eating, they could use the scoring criteria and guidelines within those subscales and not have to use the whole questionnaire." This feature allows the MEBS to be somewhat customizable, based on the information desired by the user.

COL Bridget Owens

Using data from the MEBS, the Military Nutrition Division team discovered links between stress and unhealthy eating behaviors such as emotional eating and meal skipping, with lower physical fitness scores, higher body weight and/or greater body fatness. The team also found that body weight management behaviors like frequently losing and gaining weight, known as weight cycling, are associated with poorer diet quality, greater body weight, and negative body image in soldiers.

Broadly, research conducted using the MEBS is helping to paint the picture that eating behaviors among Soldiers are shaped by a complex interplay of stress, access, emotions, physical standards, and nutrition knowledge and are related to Soldiers' ability to meet military standards such as body weight and physical performance thresholds.

CREATING DIETARY HEALTH BENEFIT THROUGH DATA TRANSPARENCY

The survey, now accessible on the USARIEM website with a government issued Common Access Card, has already been distributed to collaborators from across the services, including researchers in the Air Force and Navy who are looking at eating behaviors of pilots and Marine Corps Drill Instructors, respectively. MEBS data is also being used extensively by students in the U.S. Army Baylor University Master's Nutrition program to examine eating behaviors in military personnel.

"Having the MEBS more easily available for people to use is amazing, especially for researchers. It is exciting to be able to share the MEBS, especially because there are dietitians and physical therapists within Holistic Health and Fitness who are using this to get a better idea of how and what their personnel are eating, which can impact how the program aims to strengthen health and readiness across the Army," said Owens.

From H2F program interest to the Air Force, Space Force and international militaries, Karl said the team already has about 15 different people or organizations that have inquired or are actively using MEBS in some way.

"With so much interest from the community, it really validates our efforts and the overdue need," Karl said. "Hopefully, the MEBS can ultimately play a role in informing the design of programs that support healthy eating in military personnel, and by extension military readiness and performance optimization."

CALENDAR OF EVENTS

SEP 10 – 11
Military Tactical Communications Summit
National Harbor, MD
Taccom.dsigroup.org

OCT 13 – 15
AUSA Annual Meeting
Washington, DC
Ausa.org/meet

OCT 22 – 23
DOD/VA & GOV Health IT Summit
Washington, DC
Healthit.dsigroup.org

DEC 10 – 11
SOF & Irregular Warfare
Tampa, FL
Sof.dsigroup.org

JAN 10 – 14, 2026
IMSH
San Antonio, TX
Imsh2026.0rg

MAR 2 – 5
AMSUS
National Harbor, MD
Amsus.org

MAR 17 – 18
OPMED
San Antonio, TX
Operationalmed.com

APR 27 – MAY 1
SOMA
Raleigh, NC
Specialoperationsmedicine.org

APR 28 – 30
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MAY 18 – 22
SOF WEEK
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