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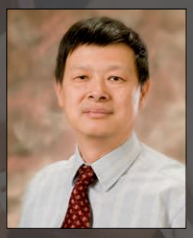
COMBAT & CASUALTY CARE

ADVANCING AUTONOMY IN FORWARD TRAUMA CARE



Dr. Xiaojiang Xu
Biophysical Mathematical Modeler
U.S. Army Research Institute of Environmental Medicine

COL Brianna Perata
Commander
Walter Reed Army Institute of Research
Silver Spring, MD

- Joint Operational Medicine Information Systems (JOMIS)
- Defense Healthcare Management Systems (DHMS)
- Operational Medicine Care Delivery Platform (OpMed CDP)
- Battlefield Assisted Trauma Distributed Observation Kit-Joint (BATDOK-J)
- Artificial Intelligence (AI)-Enabled Military Healthcare Training
- Computer Analytics-Enabled Medical Equipment Integration
- Algorithmic-Enabled, Thermoregulatory Models-Based Medicine

COMMANDER'S CORNER

COL Shaun Brown
Commander
U.S. Army Institute of Surgical Research
JBSA Fort Sam Houston, TX

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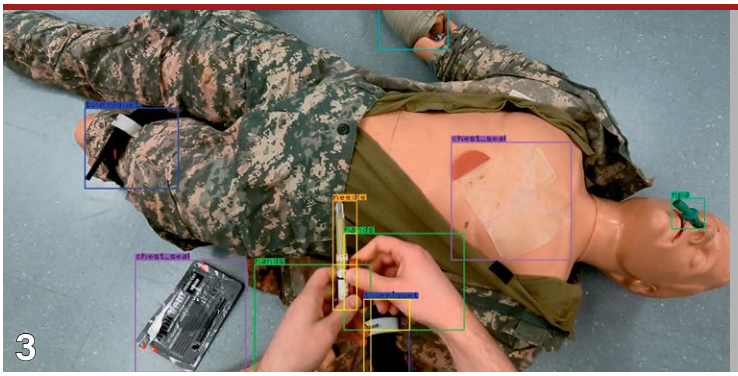

COMPUTER ANALYTICS REVOLUTIONIZING MEDICAL PREPAREDNESS

The U.S. Army and U.S. Defense Department are adopting incrementally greater fundamentals in artificial intelligence or AI as part of a growing computing domain in military healthcare.

By Dr. Matthew Hackett and Dr. Jack Norfleet

Featured Interviews

COMMANDER'S CORNER

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LEADERSHIP PERSPECTIVE

COL Brianna Perata
Commander
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Departments

Cover: An Army Reserve Medic places a nasopharyngeal tube into a casualty during a mass casualty exercise conducted by Medical Readiness and Training Command, June 6, Fort Hunter Liggett, Calif., as part of a training event at Global Medic and Mojave Falcon 25. While the injuries were simulated, the sense of urgency wasn't, as medics frantically sought to deliver essential first aid to patients before they were transported to the 801st Field Hospital, where they received further treatment and, in some cases, surgery.

MODERNIZING BATTLEFIELD MEDICINE

Program Executive Office for Defense Healthcare Management Systems (PEO DHMS) recently completed several pilot deployments of a cutting-edge advanced health IT ecosystem in real-world settings.

By Cori Hughes

INDUSTRY PARTNER

FROM STRUCTURED DATA TO FASTER DECISIONS: ENABLING CLINICAL DECISION SUPPORT ACROSS THE CONTINUUM OF COMBAT CARE

A platform designed to support how clinical encounters are documented and communicated across operational settings and echelons of care is here.

By T6 Health Systems

ADVANCING PRECISION WITHIN MODELS-BASED MEDICINE

The U.S. Army Research Institute of Environmental Medicine (USARIEM) is using algorithms with manikins and protective ensembles to boost warfighter readiness without increasing human risk.

By Maddi Langweil

EVOLUTION IN MILITARY AUTONOMOUS MEDICAL EVACUATION

A recent operational display of autonomous aerial capability demonstrated by Sikorsky's optionally-piloted vehicle (OPV) Black Hawk is extending mission reach with less risk.

By C&CC

COMBAT & CASUALTY CARE

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INSIGHTS

The Volume I 2026 edition of *Combat & Casualty Care (C&CC)* addresses the confluence of two types of medicine critical to the health of a nation's combat-ready force. Surgery-specific and general operational medical treatments can often overlap amidst the chaos of field trauma, resulting from myriad reasons relating to environmental hazards posed by enemy combatants, natural dangers, or a combination thereof. It is the job of those trained to deliver the most appropriate form of care to casualties in need which we dedicate this issue of *C&CC*.

As complexities in the health management of a modern military continue to grow, methods for meeting this challenge continue to evolve. From the Program Management Office of Joint Operational Medicine Information Systems (JOMIS). Program Executive Office for Defense Health Management Systems (PEO DHMS), comes an advanced health IT ecosystem which captures the oft elusive medical history of Servicemembers while on deployment. JOMIS combines civilian electronic health record (EHR) tools with government-developed applications to enable rapid innovation and adaptability in meeting the demands of operational treatment tracking. With the real-world health of those deployed to protect our freedoms only as sound as the standards in medical preparedness are high, the relatively-new use of computer analytics to improve healthcare training and performance assessment is enabling a level of proactivity in data access and condition diagnostics not seen before. Artificial intelligence (AI) is enabling reach in improving diagnostic time and accuracy, automating administrative tasks, and even accelerating drug discovery.

In a world where need drives the growth of capability and capability in turn drives increase in demand, the microcosm that is forward trauma care has fueled an evolution in mobile surgical application. The U.S. Army Institute of Surgical Research (USAISR) is leading the charge in focusing on what adaptability in surgical access can do to address the increasing reality that prolonged casualty sustainment is and will remain a challenge in future combat. COL Shaun Brown, Commander, USAISR, enlightens us as to how AI is pushing the survival window with the use of Compensatory Reserve Measurement (CRM) as a "fuel gauge" for identifying casualty vital signs degradation faster than previously thought possible. As a future involving readiness for ever-present large-scale combat operations (LSCO), anticipated delays in ground evacuation with contested air superiority is moving Role I medical care ahead in priority to ensure point-of-injury care is much more than merely stabilizing care.

From health care preparedness to vital signs prognostication, AI is seeing application immediacy in the defense medical space. One such application is in the development of models-based medicine where tools such as manikins and protective ensembles are bringing the environment to the facility. The U.S. Army Research Institute of Environmental Medicine (USARIEM) is employing mathematical algorithms to test tools such as anatomical training tools and clothing without the need for human interaction so that improvement is achieved without the need for user feedback. This proactive methodology bypasses the need for time-consuming user testing, making higher-precision products field-ready sooner.

As always, we appreciate any comments or suggestions! Thanks for your continued readership!

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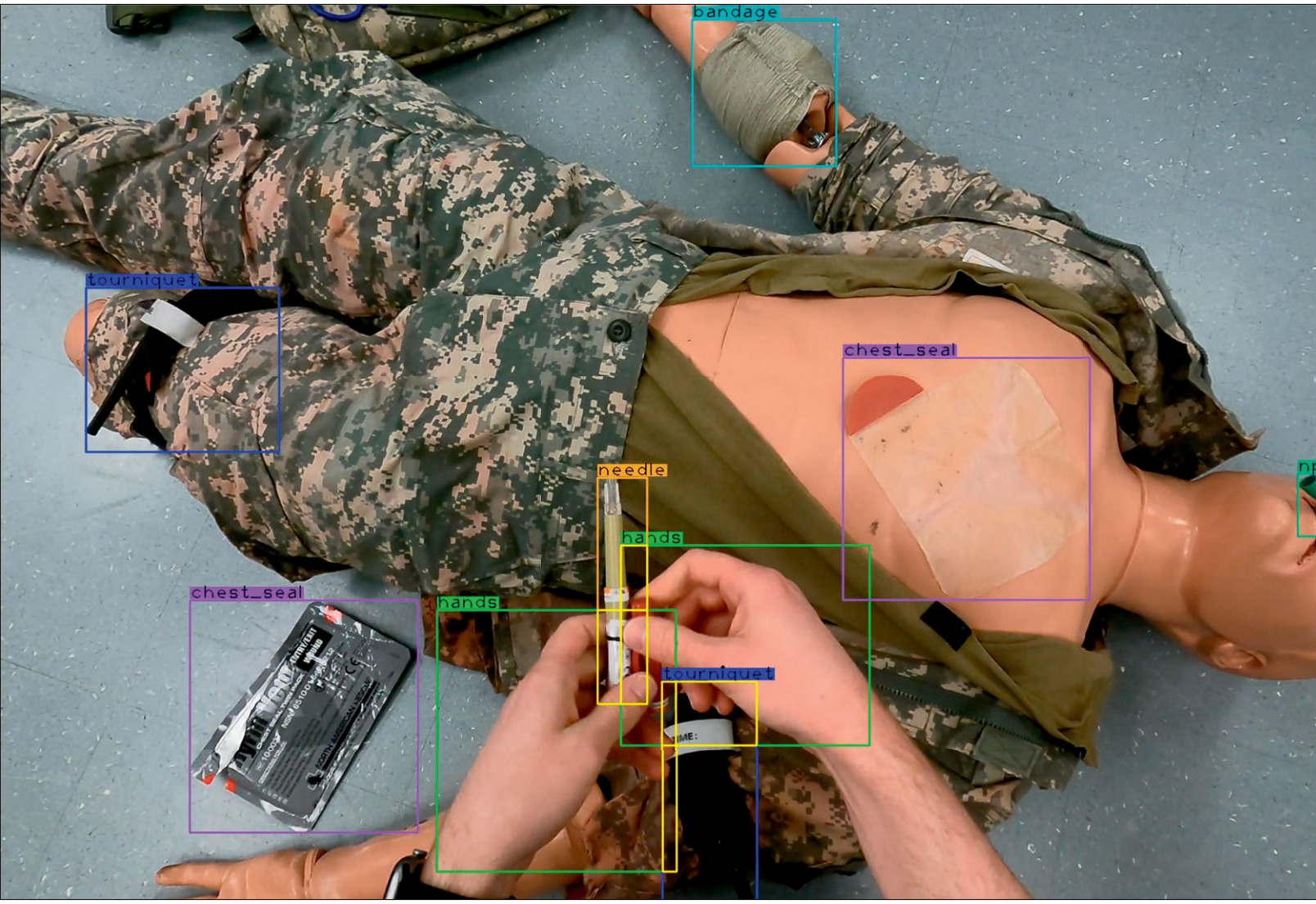
COMPUTER ANALYTICS REVOLUTIONIZING MEDICAL PREPAREDNESS

U.S. Army Combat Capabilities and Development Command (DEVCOM) Soldier Center, Natick, MA, is partnering with industry to develop advanced artificial intelligence (AI) and computer vision for improving healthcare training and performance assessment.

By Dr. Matthew Hackett and Dr. Jack Norfleet, Army Futures Command, DEVCOM Soldier Center – STTC



Vision-Based Intelligence Developed for Educational Operations (VIDEO) computer vision system showing detection of tourniquet, chest seal, needle, bandage, nasal pharyngeal airway, and provider hands. (DEVCOM Soldier Center)

Artificial intelligence (AI) is transforming the Military Healthcare System (MHS) from the battlefield to the bedside. In clinical settings, AI is improving diagnostic time and accuracy, automating administrative tasks, accelerating drug discovery, and much more. At the same time, battlefield medicine and casualty care are being improved by optimizing logistics and implementing decision support tools using a variety of AI techniques. With the increasing use of AI across healthcare, it should be no surprise that AI is greatly impacting the training domain. Prior to any patient encounters, military providers undertake rigorous training to prepare for the challenge of rendering care during military operations. AI is improving the education and training process with advanced analytics and scenario generation. However, one facet of AI, computer vision, has tremendous potential to enable training capabilities heretofore unattainable.

Computer vision is a sophisticated domain of AI that trains computers to interpret and understand the visual world. Drawing heavily on deep learning models and neural networks, it enables machines to capture, process, and analyze images and videos in a way that mimics human vision. This process involves identifying and classifying objects, recognizing faces, and even comprehending the context and content of a scene. A prominent and widely understood example is found in autonomous vehicles. These vehicles rely on a stream of video data, which computer vision algorithms analyze in real-time to identify other cars, pedestrians, traffic lights, and road signs. This continuous scene understanding allows the vehicle to make critical decisions that enable safe and effective navigation. Ultimately, the goal of computer vision is to extract meaningful information from visual inputs to automate complex tasks and solve real-world problems. In military medical training, computer vision is being used to automate video after action reviews (AAR), improve performance assessment, and much more.

An instructor multi-tasking during a combat casualty care training exercise: assessing multiple trainees, operating training aids, and facilitating the exercise. (DEVCOM Soldier Center)

CHALLENGES IN MILITARY HEALTHCARE TRAINING

Military healthcare training must evolve to address new operational challenges, including preparing providers for large scale combat operations and prolonged care. That means upskilling the medical force, without requiring more time and resources. Computer vision has the potential to be a key component in achieving this goal, addressing long-standing challenges in the training space. To begin, most training events include at least 3 phases: a pre-brief detailing the objectives of the training; the actual exercise during which patient care is performed; and debriefing, or AAR, wherein performance of the trainees is reviewed. Instructors desire video debriefs, but the video is often cumbersome due to the volume of footage and syncing multiple camera feeds.

Additionally, performance assessment within medical training is often subjective, lacking any objective data from training aids or simulators. This results in non-standardized evaluations, as different instructors have different mental models of 'correct.' Beyond the issue of subjectivity, most evaluations use a simple 'go / no-go' checklist. The assessment results are typically not digitized, meaning the data associated with trainee performance is not stored or analyzed.

Finally, military training, like in the civilian sector, has a shortage of qualified instructors across the healthcare enterprise. Instructors are often asked to fulfill multiple roles, including site administration and personnel management on top of education and training. Within a training event, an instructor may have to juggle teaching content, operating training aids, integrating special effects for realism (smoke, sound, etc.), assessing trainees, and providing remediation. There is a huge need for capability that can unburden instructors, enabling them to focus on the learner, rather than filling out paperwork.

COMPUTER VISION – ENABLED HEALTHCARE TRAINING

Recent research from U.S. Army DEVCOM Soldier Center has advanced computer vision for use in medical training. The research team, led by Drs. Matthew Hackett and Jack Norfleet, has created a capability which uses man-worn or environment video cameras combined with computer vision algorithms to detect and assess medical procedures during training events. The system, known as Vision-Based Intelligence Developed for Educational Operations (VIDEO), is applicable for multiple use cases.

To begin, the system automatically bookmarks relevant medical or tactical events in a training exercise. During lane training, squads navigate through a series of obstacles, treating simulated casualties along the way. These events often take 30 minutes or more. Rotations at combat training centers and larger training exercises include events of multiple hours or days. To create meaningful video debriefs, the VIDEO system can ingest all video, process it, and automatically tag all medical procedures. In short, the system creates a highlight reel of teachable moments from the training event. The capability allows instructors to immediately pinpoint the key activities and provide remediation. This is a significant improvement over manually editing video and makes video highly useful for after action reviews.

Beyond video AARs, the system is also able to provide objective measures of performance of the trainees. Metrics include treatment times and location of treatments. For example, the system can assess the time from: (1) when a hemorrhage patient is first encountered to (2) when a tourniquet application begins, and finally (3) when tourniquet application is successfully completed. This provides measures of casualty response usable by trainees, instructors, and unit leadership on the readiness of the medical force. Currently, more advanced measures are being researched, including adherence to clinical practice guidelines and correctness of treatment.

PREDICTIVE LOGISTICS AND TASK GUIDANCE

Computer vision holds promise to advance more than training for the military healthcare. To begin, researchers at the U.S. Army Institute for Surgical Research (USAISR), including Dr. Ericka Stoor-Burning and Nathan Fisher, have conducted research to automate documentation using computer vision. Using similar computer vision algorithms, these systems would recognize medical treatments and automatically fill out patient documentations, primarily a tactical combat casualty care (TCCC) card. This unburdens the provider, allowing them to focus solely on the patient.

Outside direct patient care, computer vision can be used to provide predictive logistics. As a computer vision system detects medical procedures in a clinic or hospital setting, it can assess what medical equipment and supplies have been utilized, such as the number of bandages or specific fluids expended. Using this information, the system could inform logistics and supply systems on shortages, without the need for manual inventory or ordering.

Finally, the system can be used for task guidance or decision support. The Perceptively Enabled Task Guidance program, led by the Defense Advanced Research Projects Agency (DARPA) and collaborating with DEVCOM Soldier Center, created a system that watched the provider during military medical operations. The computer vision perceived what procedure the provider was performing, as well as the specific step of the procedure. The system used a head-mounted display to provide audio and augmented reality cues to the provider if they missed a step or had an error.

AI AND COMPUTER VISION LOOKING AHEAD

As these technologies mature, the capabilities will transition from the laboratories to the warfighter. Earliest capabilities are likely to be delivered in the training domain, as the maturity of technology is less stringent compared to patient care. The research efforts and capabilities developed utilizing AI and computer vision will be key in transforming the military healthcare system, ensuring readiness for the challenges of the future.

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.

PUSHING THE LIMITS OF PRECISION SURGICAL CARE FROM ANYWHERE

Colonel Shaun R. Brown hails from St. Louis, MO. He is a 2002 distinguished graduate from Logan University and completed medical school at A.T. Still University. COL Brown completed his General Surgery Residency at William Beaumont Army Medical Center, El Paso, TX.

After completing General Surgery Residency training, COL Brown was assigned to Carl R. Darnall Army Medical Center, Fort Cavazos, TX. He deployed with the 28th CSH to Afghanistan as a General Surgeon and served as the Chief Medical Officer of his surgical detachment.

In July 2015, COL Brown began his Colon and Rectal Surgery Fellowship at the Ochsner Clinic, New Orleans, LA. Following completion, he was assigned to William Beaumont Army Medical Center as teaching faculty. During this time, COL Brown deployed with the 160th FST to Afghanistan. Additionally, he was selected for the Joint Medical Augmentation Unit and successfully completed the assessment and selection process. Following graduation from Basic Airborne School, COL Brown was reassigned to Womack Army Medical Center, Fort Bragg (now Fort Liberty), North Carolina, with augmentation to Joint Special Operations Command. During his time at Womack Army Medical Center, COL Brown became the General Surgery Program Director and was responsible for establishing a new General Surgery Residency program, the first additional U.S. Army General Surgery Residency program in over 40 years. He completed Military Freefall School and deployed to Afghanistan in support of USSOCOM in 2019 and to Iraq in 2020 and 2022.

From 2022 to 2025, COL Brown served as the XVIII Airborne Corps Command Surgeon and as the General Surgery Consultant to The Surgeon General. In this role, he served as the senior medical advisor to the Corps Commanding General and oversaw medical readiness and health service support operations for globally deployed forces. During this time, he also served as the Chief of Surgery at Womack Army Medical Center.

COL Brown completed Senior Service College (SSC) as a Veterans Affairs Fellow for Academic Year 2023–2024. Following completion of SSC, COL Brown served as the Chief of Professional Services for the 44th Medical Brigade until May 2025. He is currently serving as the Commander of the United States Army Institute of Surgical Research (USAISR).

COL Brown holds a Bachelor of Science degree from Logan University in Human Biology and a Doctor of Osteopathic Medicine from A.T. Still University.

COL Shaun Brown
Commander
U.S. Army Institute of Surgical Research
Joint Base San Antonio- Ft. Sam Houston, TX

C&CC had the distinct pleasure of speaking with COL Shaun Brown, Commander, USAISR, regarding research and capability development level efforts to continue the evolution and fielding of surgical techniques critical to today's rapidly changing global combat landscape.

C&CC: With emphasis on methods to advance pre-hospital trauma care and improve long-term patient outcomes, what are the primary focus areas for ISR in continuing to adapt forward surgical care as much as possible?

COL Brown: We must be honest about the fight in front of us. The luxury of the "Golden Hour" is gone; Large Scale Combat Operations (LSCO) will demand we think in terms of days, not minutes. The USAISR is pivoting toward a framework of prolonged casualty sustainment. In LSCO, the primary responsibility for care will likely shift to Role 1 facilities and medics due to anticipated delays in ground evacuation and contested air superiority. To support this, we are prioritizing technologies that extend the window of survival, such as the Compensatory Reserve Measurement (CRM). This artificial intelligence (AI) algorithm provides an objective "fuel gauge" for casualties' hemodynamic status, identifying decompensating casualties significantly earlier than standard vital

signs alone. Additionally, we are working to develop an advanced antimicrobial wound care foam that requires only a single change every seven days. This reduces the logistical burden of Class VIII supplies and may decrease sepsis-related mortality from evacuation delays.

C&CC: As the Army and Joint Services continue a transition to a multi-domain operations future, the criticality of a convergence of mere casualty evac with more tactically oriented evac will likely require greater modularity in forward surgical care. How do you see ISR addressing the need for this convergence?

COL Brown: To meet future battlefield requirements, we are prioritizing the development of autonomous patient monitoring and organ-support systems. Our goal is to provide world-class enroute care that maximizes our ability to clear the battlefield without compromising our servicemembers' physiological stability.

USAISR is specifically developing these autonomous systems to provide care when a human provider cannot be physically present at the litter. In contested environments

MAJ Mieke Carifee and MAJ Ian Jones, members of the USAISR Burn Flight Team, transport a simulated casualty from an austere environment to an Airfield for rapid aeromedical evacuation via a KC-46 Pegasus. The Burn flight team regularly conducts training to maintain readiness for real-world response in support of South Texas and the global burn care mission. (USAISR)

Military nurse, CPT Adrianna Garner, conducts an augmented reality-assisted fasciotomy using HoloLens technology at the USAISR Burn Center. This training scenario simulates treatment of trauma associated compartment syndrome on a high-fidelity mannequin, enhancing surgical readiness through immersive medical simulation. (USAISR)

Members of the USAISR Burn Center's patient care team demonstrate proper extremity burn-dressing techniques during a quarterly symposium. As the Department of Defense's only dedicated Burn Center, USAISR ensures critical burn care expertise is shared across the Defense Health Organization. (USAISR)

where casualty evacuation (CASEVAC) platforms may be unmanned or medical personnel are overwhelmed by mass-casualty volume, these systems serve as a "digital wingman." By automating the management of ventilators, IV pumps, and sedation, we ensure high-quality care remains consistent during long-range evacuations.

C&CC: From a mobile surgical support perspective, what are some advances in communications and operational automation that ISR is helping to create a foundation for evolution?

COL Brown: To lay the foundation for operational automation, we are leveraging AI and predictive analytics to modernize healthcare at the point of injury. CRM is a cornerstone of this evolution, analyzing pulse oximeter waveforms to predict a casualty's "true status" before they crash. We are moving toward autonomous patient monitoring systems that do more than just alert a medic; they provide the data foundation for automated organ support, such as closed-loop fluid resuscitation. Furthermore, our

Mixed Reality Triage tool automates triage categorization using a novel algorithm and pairs with the Battlefield Assisted Trauma Distributed Observation Kit-Joint (BATDOK) system to stream vitals directly to a virtual command-and-control center. This ensures that, even in high-volume mass-casualty events, no patient is left unmonitored.

C&CC: In terms of robotic-based surgical telementoring and procedural automation, what do see as key research support driving tomorrow's capability?

COL Brown: As a surgeon who performs robotic surgery within our Military Health System (MHS), I believe that fully robotic damage-control surgery is still a long way off. However, technology can be utilized today to significantly increase the skills of our medics and Role 1 providers. We are advancing Medical Extended Reality (MXR) to deliver life-saving guidance in challenging surgical environments. We have developed mature systems that use holographic overlays to guide medics through complex procedures, such as chest tube insertions and cricothyrotomies, without requiring network connectivity. Our MXR Burn application similarly automates critical calculations for burn size and fluid resuscitation, tasks that are traditionally difficult for non-specialists to perform accurately under pressure. These advances in procedural automation and decision support are precursors to fully autonomous surgical and organ-support interventions required for long-range enroute care.

C&CC: Feel free to address any current/on-going challenges and goals/achievements moving forward.

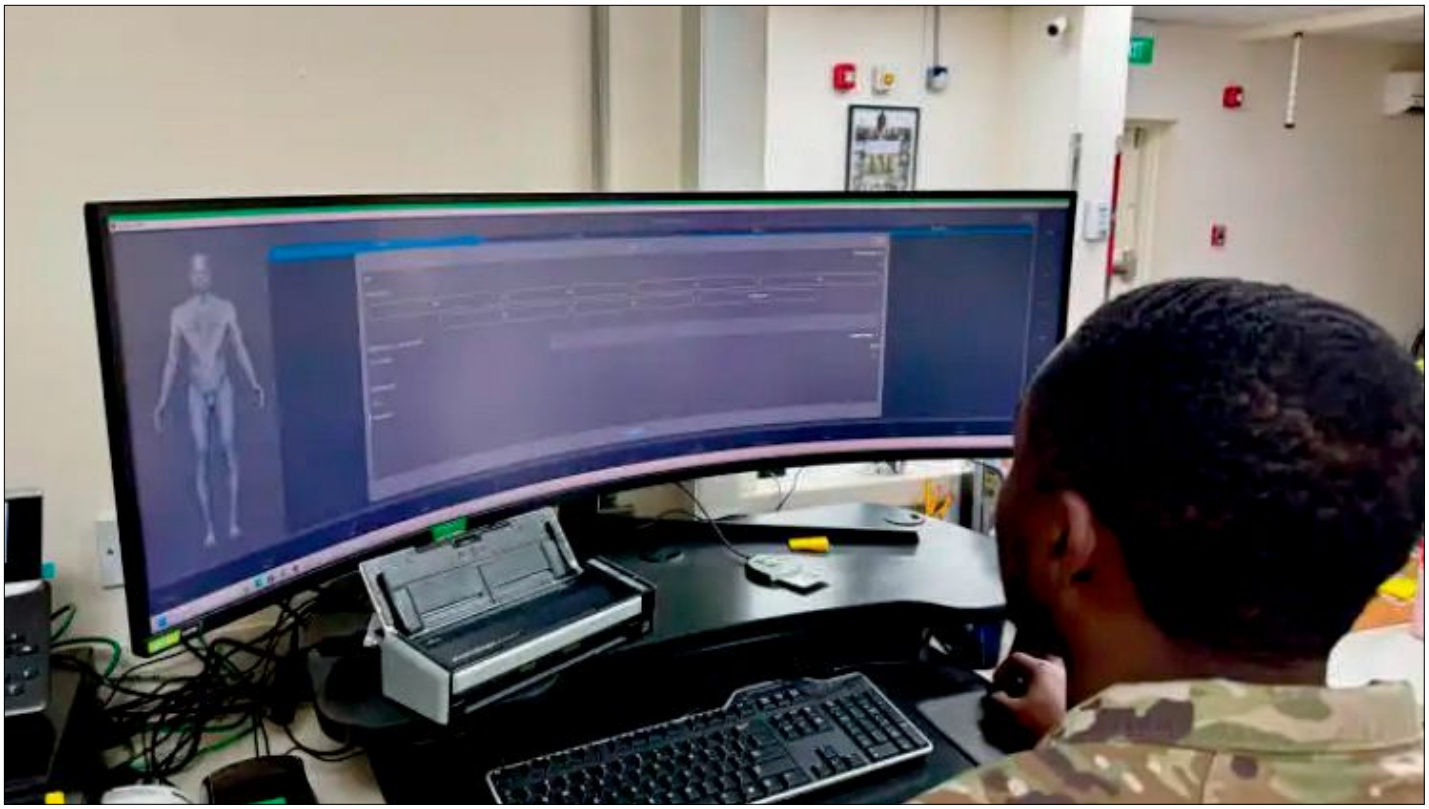
COL Brown: Our team is working hard to transition these capabilities from the lab to the operational environment, but we recognize that time is our most valuable resource. We operate with a deep sense of urgency because we do not know when the next conflict will occur or when our technology will be needed to save lives on the battlefield.

The primary challenge we face is navigating the "Valley of Death", the precarious gap between successful laboratory experimentation and formal acquisition and fielding. The clock is ticking, and we must streamline how we transition these "lab-proven" successes to our warfighters. Our goal is for USAISR to remain the premier institution for solving adaptive combat casualty care problems and delivering solutions to Warfighters.

MODERNIZING BATTLEFIELD MEDICINE

The Joint Operational Medicine Information Systems (JOMIS) Program Management Office, under the Program Executive Office for Defense Healthcare Management Systems (PEO DHMS), recently completed several pilot deployments of a cutting-edge advanced health IT ecosystem in real world settings as they prepare to launch full scale deployments.

By PEO Defense Healthcare Management Systems



OpMed Care Delivery Platform in use during recent pilot deployments at Al Dhafra Air Base in Abu Dhabi Emirates (PEO DHMS)

For years, the U.S. Department of Defense (DoD) and Department of Veterans Affairs (VA) prioritized creating an integrated longitudinal electronic health record (EHR) that captures a servicemember's complete medical history, from beginning of service through post-retirement care. However, capturing medical encounters, treatments, and exposures during deployment remains a challenge. Legacy systems provide partial solutions but lack the adaptability and user-friendliness required for the diverse and often disconnected environments where servicemembers operate. As a result, medics capture many of these encounters, treatments, and exposures on paper (not electronically), leading to incomplete, inaccessible, and unreadable data.

Recognizing these challenges, JOMIS and PEO DHMS developed a modernized health IT ecosystem that integrates tools and applications into a connected, unified experience, creating a cohesive ecosystem where tools interact seamlessly.

"JOMIS combines cutting-edge civilian EHR tools with government-developed applications to enable rapid innovation, adaptability, and the delivery of high-quality solutions that meet the unique demands of operational medicine," said Max Ramirez, JOMIS' Assistant Program Manager for Health Care Delivery.

Max Ramirez

ADVANCED POINT-OF-INJURY DOCUMENTATION AND PROLONGED FIELD CARE

JOMIS' new product suite includes Battlefield Assisted Trauma Distributed Observation Kit-Joint (BATDOK-J), Operational Medicine Care Delivery Platform (OpMed CDP), MHS GENESIS-Theater (MHSG-T), Theater Blood-Mobile (TBLD-M), Medical Hub (MEDHUB), Joint Medical Planning Tool/ Medical Planner's Toolkit (JMPT/k), Transportation Command Regulating and Command & Control Evacuation System (TRAC2ES), and Operational Medicine Data Service (OMDS). Together, they provide medical personnel in operational environments with a unified user experience.

BATDOK-J is a cutting-edge mobile application for point-of-injury care and patient monitoring. Developed by the Air Force Research Laboratory and managed by JOMIS, BATDOK-J enables medics and first responders to document care in real-time while simultaneously monitoring multiple patients' vital signs wirelessly. The application integrates seamlessly with wearable sensors, allowing medics to track critical metrics such as heart rate, oxygen saturation, and blood pressure, even in high-stress and austere conditions. BATDOK-J works on Android devices (and iOS in future build) and features an intuitive interface to allow rapid user adoption with minimal training.

One of BATDOK-J's standout features is its functionality in disconnected environments, utilizing encrypted QR codes to securely transfer patient data between devices. This ensures vital medical information moves with the patient during handoffs, even in scenarios without network connectivity. BATDOK-J supports mass casualty scenarios by enabling medics to triage and manage multiple patients simultaneously, prioritizing care based on real-time data. Soldiers, Sailors, Airmen, and Marines extensively field-tested it to prove its reliability and effectiveness. BATDOK-J represents a significant leap forward in battlefield medicine, empowering medics to capture and deliver life-saving care with greater precision and efficiency.

OPERATIONAL CARE DELIVERY

OpMed CDP is a fit for purpose and scalable EHR solution designed to meet the unique demands of operational medicine across deployed environments. It's configured from a commercial product widely used in civilian trauma centers.

OpMed CDP allows medical personnel to document care, manage patient records, and order ancillary services such as pharmacy, laboratory, and radiology without requiring network connectivity. Data stores locally and automatically transmits to MHS GENESIS (the Federal EHR) once connectivity is enabled. It provides a secure, scalable, and resilient infrastructure for operational medicine, enabling seamless integration with the full product ecosystem.

OpMed CDP supports a wide range of capabilities, including mass casualty, triaging, disease and non-battle injury documentation, damage control resuscitation, damage control surgery, patient administration, tracking, and hold capabilities. It enhances medical readiness, standardizes documentation, and ensures critical medical data is available for decision-making during emergencies.

John de Geus

MHS GENESIS-THEATER: ROLE 3 AND BEYOND

Sandy McIntyre

MHSG-T is a theater-specific configuration of MHS GENESIS, the DoD EHR already deployed across all 3,600+ garrison hospitals and clinics. Designed for Role 3 facilities like theater hospitals and hospital ships, MHSG-T provides definitive care, including surgery and intensive care, for patients evacuated from forward-deployed locations. It supports OCONUS (Outside the Continental United States) "fight tonight" environments, ensuring medical teams can access critical EHR capabilities even in austere and rapidly changing operational conditions.

MHSG-T also functions in disconnected environments like BATDOK-J and OpMed CDP, an essential function for maintaining comprehensive medical records in dynamic and resource-constrained environments. JOMIS completed MHSG-T installation onboard the USNS Mercy last summer with upcoming deployment planned to the USNS Comfort and other sites.

DATA INTEROPERABILITY AS A LIFELINE

OMDS acts as the data broker for theater medical encounters, ensuring medical information flows seamlessly across systems to support informed decision-making and continuity of care. OMDS securely stores data from operational environments and forwards DoD beneficiary information to MHS GENESIS and other data consumers across the Federal EHR ecosystem. This capability ensures medical records are accessible to providers at military treatment facilities, within the VA, and civilian healthcare partners, enabling a smooth transition of care for servicemembers.

By adopting industry-standard code sets and data standards to capture structured data, JOMIS enables consistent, accurate, and actionable medical documentation, leading to better-informed decisions as patients transition from theater environments to definitive care settings. Structured data enhances readiness by providing commanders and medical planners with reliable information to assess health trends, allocate resources, and improve outcomes.

JOMIS also collaborates with NATO and allied partners to ensure secure health information sharing during combined and joint operations, maintaining interoperability and coordination in multinational environments where shared medical data can improve patient care and operational effectiveness.

"By prioritizing secure and standardized data exchange, JOMIS is strengthening global partnerships and enhancing the ability to deliver high-quality care in coalition settings," said Ramirez.

LOOKING AHEAD

JOMIS conducted several successful pilot deployments of OpMed CDP and other tools within the ecosystem, gathering experiential data to refine the systems for full-scale fielding.

"Feedback from end users has been overwhelmingly positive," said Ramirez. "It highlights the intuitive design and enhanced functionality of these solutions compared to legacy systems." Full product deployments will begin in 2026, with plans to expand the ecosystem across all Services.

JOMIS continues to modernize deployed products such as MEDHUB, JMPT/k, TRAC2ES, and OMDS with a focus on seamless integration into the broader ecosystem. JOMIS is also preparing to field TBLD-M in 2026. TBLD-M provides blood management and Class VIII B medical supplies, ensuring full visibility and management of donor information, inventory, and transfusion data, ensuring the availability of life-saving blood products in theater.

"We've developed this agile software for three plus years to provide better decision support at the point of care for medical providers, and also to provide data to operational commanders in dynamic real-time environments" explained CDR John de Geus, former chief health informatics officer for the Navy.

"The modernization of operational medicine through the JOMIS ecosystem represents a transformative leap forward in battlefield care," said Sandy McIntyre, JOMIS Program Manager. "We're focused on making sure servicemembers receive the care they need and deserve, wherever they are deployed."

FROM STRUCTURED DATA TO FASTER DECISIONS: ENABLING CLINICAL DECISION SUPPORT ACROSS THE CONTINUUM OF COMBAT CARE

Modern combat casualty care depends on more than clinical expertise alone. Across the continuum of care - from initial treatment through evacuation and onward to Role 3 facilities - medical teams operate under time pressure, constrained resources, and rapidly shifting operational conditions. Clinicians must assess, intervene, document, and communicate simultaneously. In these environments, the structure and usability of clinical information directly influence decision speed and care continuity.

Whether operating in a high-volume military treatment facility, aboard maritime platforms, or in distributed settings with limited connectivity, fragmented workflows and unstructured documentation delay access to critical information.

T6 Health Systems is addressing this challenge by enabling care teams to capture and use structured, actionable clinical data - not as an administrative exercise, but to support real-time clinical decision-making. The approach is grounded in a practical principle: documentation should reinforce care delivery across the continuum, not compete with it.

A PLATFORM BUILT FOR CONTINUITY OF CARE

T6 Health Systems delivers a platform designed to support how clinical encounters are documented and communicated across operational settings and echelons of care. For clinicians, this means less time navigating complex templates or re-entering information, and more time focused on assessment, treatment, and coordination.

When documentation is structured and encounter-centric, clinical information becomes easier to access across teams, units and platforms – supporting continuity as patients move through evacuation chains and extended treatment pathways.

WHY STRUCTURED DATA MATTERS ACROSS ROLES OF CARE

Operational clinicians are expected to deliver timely, accurate, and fully documented care despite variability in staffing, bandwidth, and operational tempo. Structured documentation helps keep critical clinical information usable as care evolves across locations and roles.

This approach enables several operational advantages:

- Faster clinical decision support by surfacing relevant information in context
- Improved efficiency and streamlined workflows
- Reduced cognitive burden by organizing documentation around the encounter
- Clearer handoffs by preserving key details across transitions

The objective is earlier clarity – without slowing providers.

OPERATIONAL USE ACROSS DIVERSE CARE ENVIRONMENTS

Across the military health ecosystem, T6's recent initial-phase operational deployments reflect growing demand for systems that perform in real-world conditions and scale across mission sets. Early use environments, including USS Carney, Brooke Army Medical Center, the White House Medical Unit, Al Dhafra Air Base, and USS Kearsarge, share a common requirement: the ability to document care rapidly, maintain continuity, and support clinical decision-making under operational constraints.

When documentation is intuitive, structured, and aligned to clinical workflow, providers spend less effort managing information and more effort managing patient care. Across these settings, structured clinical capture reduces friction for clinicians while improving the reliability of medical information, an essential foundation for sustaining care across the continuum.

SUPPORTING JOINT READINESS THROUGH JOMIS ALIGNMENT

Momentum behind these efforts is supported by alignment with the Joint Operational Medicine Information Systems (JOMIS) framework, an evolving initiative focused on modernizing operational medical capabilities across the Joint Force. As combatant commands and Services pursue interoperable, mission-ready systems across joint and coalition environments, the ability to capture and transmit structured clinical data in real time has become an operational necessity.

This alignment enables clinical information to move with the patient across roles of care, supporting continuity during evacuation, extended care, and definitive treatment.

SUSTAINING CARE WITH SMARTER CLINICAL SUPPORT

Operational medical teams require tools that keep pace with real-world demands without adding unnecessary complexity. By improving how clinical encounters are captured and translated into structured, usable insight, T6 is helping reduce documentation burden, strengthen transitions of care, and support faster decision-making across the continuum of combat care.

Systems that preserve clinical intent over time are not administrative conveniences; they are essential enablers of effective care wherever the mission demands.

T6 HEALTH SYSTEMS

T6 HEALTH SYSTEMS

CLINICAL DATA AT THE SPEED OF COMBAT

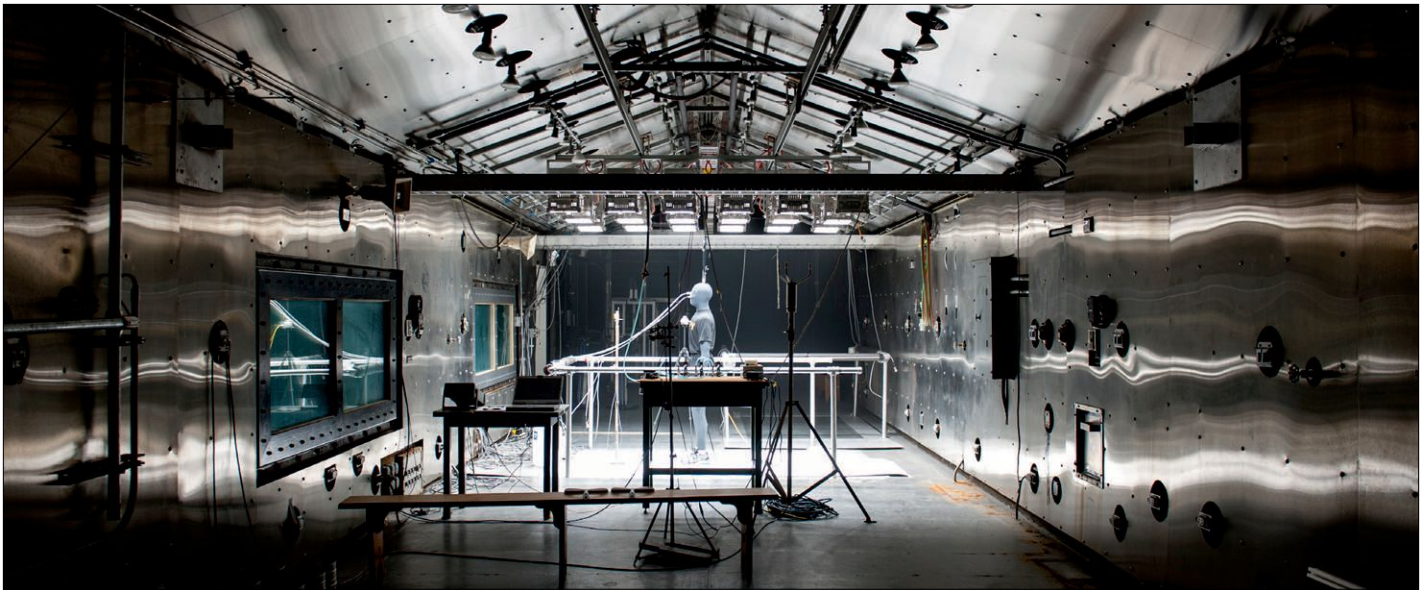
T6 Health Systems is built for the realities of operational medicine—capturing, moving, and activating clinical data across roles of care in connected and DDIL combat environments. MASCAL, trauma, surgery, and sick call data entered at the encounter move efficiently across echelons—often ahead of the patient—so receiving teams have immediate context. Embedded decision support turns documentation into better informed care, helping providers assess, prioritize, and intervene faster.

Fully interoperable with MHS GENESIS, T6 is the modernized joint care delivery system that lets providers focus on care, not reconstructing events or chasing records. T6 Health Systems is the direct recipient of a multiyear commercial software award by the U.S. Government to capture, move, and activate clinical data across the operational landscape.

ADVANCING PRECISION WITHIN MODELS-BASED MEDICINE

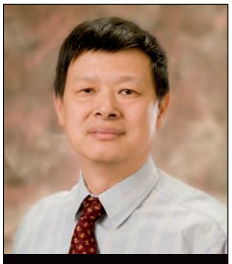
The U.S. Army Research Institute of Environmental Medicine (USARIEM) is focusing on the development of models and algorithms for applications, such as manikins and protective ensembles, to boost warfighter readiness without putting them at risk.

By Maddi Langweil, USARIEM



The Newton thermal manikin was positioned inside the environmental chamber where the solar tests were conducted. Throughout the experiment, 30 independent zones on the manikin were measured to demonstrate the extent and distribution of heat gain, providing a detailed understanding of how each body part was affected. (USARIEM)

Warfighter uniforms might seem simple in appearance, but there is more behind the scenes that does not always meet the eye. From boot insulation to sweat-resistant jackets — every detail has mathematical reasoning backing it to support the warfighter's ability to adapt to and overcome extreme environmental conditions in the Arctic, tropics or on mountains and below ground. But, testing warfighters in military protective clothing and equipment in extreme environments is not always effective, safe, or cost effective.



Dr. Xiaojiang Xu

To research military clothing safety and efficiency without risking lives or enduring high expenses, the U.S. Army Research Institute of Environmental Medicine (USARIEM) introduced the thermal manikin, a research instrument used to measure thermal and evaporative resistances of military clothing and individual equipment. The thermal manikin measurements provide the necessary inputs for mathematical models that simulate physiological responses to shifts in environmental conditions. The manikin and modeling approach allows USARIEM Biophysical Mathematical Modeler Xiaojiang Xu, Ph.D., and his team to quantify risks and benefits associated with a wide array of clothing and equipment in temperatures as high as 88 and as low as -50 degrees Celsius.

From as early as the 1940s when the Institute first introduced manikin and modeling research, the manikins had an electroplated copper shell from 3 to 6 mm in thickness with a single electrical circuit that uniformly heated the copper shell. Since then, this research has come a long way, has been continuously advancing and leading progress in the field. Today, five advanced thermal manikins and the state-of-the-art human thermoregulatory models developed in-house are used to evaluate clothing. Even though thermal manikins and thermoregulatory models simplify the complex regulatory mechanisms of the human, Xu says it is one of the best human-centric approaches to making a difference for our warfighters.

Dr. Xu spoke with Combat & Casualty Care regarding his recent and ongoing efforts in mannikin research to help advance modeling as a tool to enable users to gain greater and more precise data relating to environmental impacts on injury trauma.

C&CC: Why should people know about the manikin research at USARIEM?

Dr. Xu: The manikin and modeling research at USARIEM has the capability to translate the manikin results into predictions of physiological responses under various operational scenarios, e.g., heat, cold and water immersion. The information produced is essential for materiel developers and warfighters to make informed decisions. This capability relies on physiology, clothing biophysics, advanced model tools, manikin fundamentals, modeling skills and decades of expertise. This capability is critical in making manikin data physiologically and operationally meaningful. While data from thermal manikins is becoming accessible and popular, some labs may be limited to one area of study, but USARIEM is uniquely positioned to study heat, cold and immersion.

Recently, USARIEM began evaluating the heat strain associated with personal protective equipment worn by F-35 pilots. This effort is being conducted for the F-35 Lightning II Joint Program Office through the U.S. Army Combat Capabilities Development Command Soldier Center. The personal protective equipment under evaluation includes a flight helmet, chemical protective mask, chemical protective clothing, anti-immersion suit, anti-G suit, and flight gloves. Engineers from the F-35 JPO and DEVCOM SC visited USARIEM to finalize the test procedures and ensure proper donning of the PPE on the manikin. By the end of 2025, the resulting heat strain data will help the F-35 JPO understand how the equipment affects pilots' comfort and physical performance.

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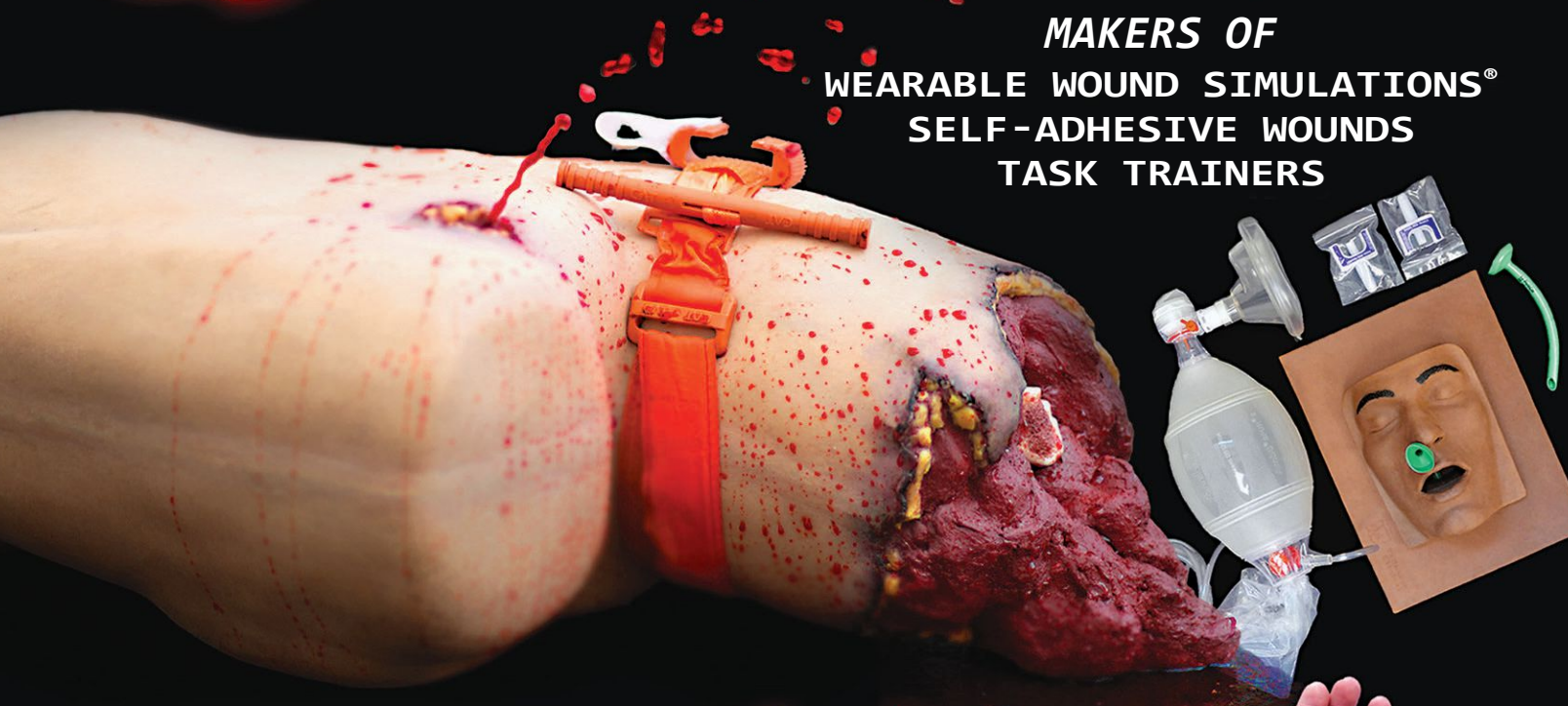

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C&CC: How has the use of manikin modeling accelerated research and improved warfighter performance and lethality?

Dr. Xu: Manikin research (manikin and modeling) is a timesaving (effective and efficient) approach for PPE research and development in comparison with human subject tests. Human tests usually involve protocol development, ethical approval, subject recruiting, experimental system setup and data analysis, etc. However, manikin research skips all these processes and can start testing and modeling directly. For example, when a materiel developer has developed a PPE prototype, we can test the protype on a thermal manikin to measure thermal and evaporative resistances, then we predict human thermal responses while wearing this prototype to assess the prototype's performance and provide feedback to the developers. All this can be done within weeks. In addition, manikin research is able to assess PPE performance in any extreme environmental conditions while human subject evaluations in extreme conditions are often difficult to conduct due to challenge to recruit volunteers, safety or ethical concerns.

Thermal manikins have been used at USARIEM to study a wide range of PPE which include clothing, chemical protective clothing, anti-immersion suit, handwear, footwear, cooling garment, heated garments and sleeping bags, etc. Almost of all the PPE items utilized by U.S. Army Warfighters have been evaluated and studied at USARIEM.

In addition to this comprehensive evaluation of clothing and PPE, modeling research at USARIEM has contributed mission critical knowledge products such as exposure guidance and mission planning decision aids. For example, the Cold Weather Ensemble Decision Aid, known as is for prevention and management of cold weather injuries (e.g., hypothermia, frostbite), Heat Strain Decision Aid is for prevention and management of heat stress and illness, and Probability of Survival Decision Aid is for survivability prediction during water immersion (i.e., hypothermia). PSDA has been used by USCG for optimal mission planning since June 2010.

USARIEM manikin research has made noteworthy contributions to the scientific world in general. One of significant work produced by manikin research at USARIEM was the introduction of the moisture permeability index in 1962. This index characterized the resistance by protective clothing to the transport of water vapor. At that time, one area of new research was focused on the resistance by protective clothing to the transport of water vapor and its impact on soldier performance. This index made it possible to study the "breathability" of PPE, such as chemical and biological protective clothing, body armor. As sweating manikins have been becoming available and popular, this index has been gradually evolved into the evaporative resistance which is one of the two clothing biophysical parameters in use today: thermal resistance and evaporative resistance.

In addition, manikin research at USARIEM has been actively involved in development and update of all American Society of Testing and Materials International manikin related standards. Some of these standards were primary based on the works from USARIEM. ASTM manikin standards are widely used globally to ensure accuracy, repeatability, and quality of manikin evaluation. ASTM International is a globally recognized leader in the development and delivery of voluntary consensus standards.

C&CC: What's fascinating about the manikin research that people might not know?

Dr. Xu: My favorite part is the opportunity to bring physiology knowledge to the hands of materiel developers to enhance their research and development for better PPE and to bring the physiology knowledge to the hands of Warfighters to support mission planning. The manikin and modeling research at USARIEM is a natural "bridge" between physiologists (at USARIEM and elsewhere) who study the biological mechanisms of how the human responds to exercise and environmental stressors – and the scientists, engineers and technicians who develop the materiel products for the Warfighter.

The U.S. Army Research Institute of Environmental Medicine researcher, Timothy Rioux, demonstrates the principle of evaporative resistance in textiles using the Newton manikin. Rioux explains how the specific type of clothing worn by a warfighter affects the heat exchange between the human body and the environment they are in. (USARIEM)

For example, the Cold Weather Ensemble Decision Aid is for cold stress/injury prevention and management, while the Heat Strain Decision Aid is for heat stress/illness prevention and management are outcomes of the manikin research. These decision aids are knowledge-based tools that support Warfighters mission planning to optimize performance and ensure mission success.

My favorite memory is that we have successfully found solutions to questions that no answer existed. For example, when materiel developers asked me if their ensembles were good for warfighters exposed to -50°C about 15 years ago, I realized that no method was available to provide sensible answers. Since then, we conducted research and developed a human-centric approach to evaluate the performance of the cold weather ensemble. The thermal performances of cold ensembles were defined as endurance times instead of insulation values to represent the protection level an ensemble provides. Thus, the performance is easily understood by materiel developer or warfighters and directly related to cold injury risks during operations in extreme cold. This approach has been progressively adopted by DOD PPE community as the method to evaluate newly developed cold weather PPE items and to verify cold weather PPE thermal performance in support of procurement decision-making.

C&CC: How could this be more effective than using soldiers as subjects?

Dr. Xu: Consequence: cost to purchase manikins and maintenance, power usages, etc. Although manikin and modeling technologies have been advancing, it is still relatively simple in comparison with the complicated system it attempts to present (i.e., human). Using human subjects (representative of the soldier population) is the standard approach to evaluate PPE performance. But this approach is often restricted by many factors, such as challenges to recruit volunteers, safety, ethical considerations, and facility costs. Thus, manikin research (manikin and modeling) is essential to continue to answer important questions and optimize Warfighter lethality in our current era of constrained resources.

EVOLUTION IN MILITARY IMPLEMENTATION OF AUTONOMOUS MEDICAL EVACUATION

In partnership with the Joint Personnel Recovery Agency and the Defense Advanced Research Projects Agency (DARPA), Sikorsky fielded its optionally-piloted vehicle (OPV) Black Hawk aircraft at Northern Strike 25-2 this past August 2025 to demonstrate, in an operational environment, how an autonomous Black Hawk can expand mission reach and reduce risk to soldiers.

Army National Guardsmen assigned to the Tennessee ARNG's Forward Medical Support Element Platoon (MEDEVAC) General Support Aviation Battalion, headquarted in Knoxville, Tennessee, conduct MEDEVAC operations with a UH-60L Black Hawk helicopter with flight paramedics on board during a culminating training exercise at Fort Hood, Texas, Jan. 13, 2026. The exercise demonstrated total force integration and interoperability between both ground and air assets from units across the country to achieve mission success. (U.S. Army National Guard photo by Staff Sgt. Seth LaCount)

Sikorsky's MATRIX™ technology is the enabling technology for optionally piloted flight, which includes the option for no pilots on board. MATRIX™ forms the core of DARPA's Aircrew Labor In-cockpit Automation System (ALIAS) project, an ongoing collaboration between Sikorsky and DARPA since 2015.

EVOLVING CAPABILITY THROUGH TESTING

Sikorsky, a Lockheed Martin company, and the Defense Advanced Research Projects Agency (DARPA) first successfully demonstrated these autonomous mission scenarios to the U.S. Army in mid-October 2022.

Three demonstration flights totaling 2.4 hours were performed at Yuma Proving Ground in Arizona as part of the U.S. Army's Project Convergence 2022 (PC22) Technology Gateway exercise.

"During PC22 Technology Gateway, we showed how the optionally piloted Black Hawk helicopter can be flown by human pilots, who then land the aircraft and simply flip a switch to activate flight with zero pilots," said Igor Cherepinsky, Sikorsky Innovations director.

"With no humans on board, the aircraft flew at 100 knots, to deliver a large quantity of blood product, an external cargo load, and rescue a casualty."

At Northern Strike, OPV Black Hawk demonstrated three types of cargo delivery, including internal carry, external sling load and precision parachute drop, as well as a MEDEVAC exercise. In a third exercise, HIMARS External Sling Load and MEDEVAC Recovery involved a test where an OPV Black Hawk completed six autonomous hovering hookups to transport High Mobility Artillery Rocket System or HIMARS launch tubes to an alternate landing zone. A soldier then used OPV Black Hawk to conduct a simulated personnel recovery, including a tail-to-tail patient transfer to a piloted Black Hawk at an unimproved landing site. This was the first time an untrained soldier commanded an autonomous MEDEVAC recovery from inside the OPV Black Hawk aircraft.

"With lives on the line, Sikorsky's MATRIX™ flight autonomy system can transform how military operators perform their missions," said Rich Benton, vice president and general manager of Sikorsky, a Lockheed Martin company. "An optionally piloted Black Hawk aircraft can reduce pilot workload in a challenging environment or complete a resupply mission without humans on board. In contested logistics situations,

A flight crew assigned to Charlie Company "DUSTOFF", 3rd Battalion, 25th Aviation Regiment, 25th Combat Aviation Brigade assisted in simulated Medical Evacuation (MEDEVAC) requests during a 25th Infantry Division Jungle Medicine training exercise at Schofield Barracks, Hawaii on January 13, 2025. DUSTOFF operated an external hoist system on a HH-60M Black Hawk helicopter to MEDEVAC a rescue randy, a medical training mannequin. Jungle Medicine is the premiere jungle-oriented medical training course offered in Oahu, it includes students from all branches of the U.S. Military who train in realistic and austere environments. (U.S. Army Photo by Sgt. Olivia Cowart).

a Black Hawk operating as a large drone offers commanders greater resilience and flexibility to get resources to the point of need."

MATRIX™ technology, leveraged to support DARPA's Aircrew Labor In-cockpit Automation System (ALIAS), gives operators control of advanced aviation, a capability once reserved for trained pilots, enabling resupply, personnel recovery and contested logistics missions in dangerous or low-visibility areas without putting human life at risk.

STREAMLINING AUTONOMOUS CONTROL

The Black Hawk aircraft flown for the autonomous demonstrations is optionally piloted — meaning the same aircraft can be flown by two pilots, one pilot, or no pilots, depending on the mission requirements.

Unlike other uninhabited aircraft that rely on a ground-based pilot to fly the aircraft, the MATRIX™ system gives full control to the aircraft's flight computer, which compiles a flight plan based on high level goal inputs, such as destination location, distance, and topography. Autonomous flight demonstrations with the optionally piloted Black Hawk helicopter will inform U.S. Army leadership how its existing and future fleet of piloted utility helicopters could one day also fly uncrewed to resupply forward forces in contested battlespace or limited visibility environments.

"We believe MATRIX™ Technology is ready now for transition to the Army as they look to modernize the enduring helicopter fleet, and acquire Future Vertical Lift aircraft," said Cherepinsky.

"In addition to increasing flight safety and reliability, MATRIX™ enables survivability in high tempo, high threat 21st Century Security environments where Black Hawks operate today, and next generation aircraft could operate in the future."

ARTIFICIAL NEURAL CONNECTIVITY

Colorado University (CU) Boulder biomedical engineer Jacob Segil is working to bring back that sense of touch for amputees, including veterans of the wars in Iraq and Afghanistan. Through an effort led by Case Western Reserve University and the Department of Veterans Affairs, Segil and his colleagues have used a unique "neural interface" to give a small number of amputees back the sense of touch in their missing fingers. In a recent study, the team demonstrated just how effective this sensory restoration technology can be—helping one amputee to feel his hand adopt a series of postures, such as a gesture resembling the thumbs-up sign.

MIMICKING LIMB TO BRAIN INTEGRATION

In the 2000s, Tyler invented a way to, essentially, hotwire the human nervous system. His interface, called a nerve cuff electrode, surrounds the nerves and zaps them with electronic pulses. Adjust those signals just right, and they will travel to the brain, tricking it into thinking that it can feel fingers, even if there are no fingers to feel.

"We're tapping into that wire before it gets to the brain, and then the brain can't tell whether it's coming from the finger or from our artificial system," said Tyler, a professor at Case Western and a VA researcher. Segil explained that while artificial hands have grown more high-tech in recent years, many amputees still choose not to use them—in large part, because these devices are numb. "All prosthetic devices that have ever been used are 'disembodied. They are tools, external to the body. They are the equivalent of a tennis player and their racket."

In the recently published case study, Segil and his colleagues began to probe whether sensing prosthetics could do more—becoming a meaningful part of a person's body. The researchers worked with one volunteer, a man in his 40s who had lost his arm below his elbow six years before. They fed his neural interface varying patterns of sensory information—say, cues that he was picking up a penny. The group then asked the man to, while his prosthetic was hidden from view, decide what position his hand was in from a menu of seven postures. The interface did the trick. With enough practice, the man was able to identify the seven postures with up to 95% accuracy.

"When you have five points of information, the user is able to synthesize those to get a broader view of what the state of the hand is," Tyler said.

More info: aptcenter.research.va.gov

ADVANCED IMAGING, DETAILED DIAGNOSTICS

Two cutting-edge imaging technologies being developed by the Telemedicine and Advanced Technology Research Center (TATRC) will be tested at the Army's flagship persistent experimentation activity in Spring 2026. The two technologies, which comprise TATRC's Vision and Intelligence Systems for Medical Teaming Applications (VISTA) system, use advanced machine-learning algorithms to extract detailed diagnostic information from visual images obtained by off-the-shelf digital cameras. One of the systems operates at the point of injury, while the other functions at the point of care. Both technologies are the result of a long-term collaboration with industry partner Areté Associates.

The Vision and Intelligence Systems for Medical Teaming Applications Point of Injury system, developed by the Telemedicine and Advanced Technology Research Center, is a sensor and software payload that can be installed on unmanned aerial systems to provide medics with a standoff casualty detection and monitoring capability. VISTA POI transmits an image of a detected casualty and their estimated vital signs to a handheld pilot display screen. Researchers from TATRC and industry partner Areté Associates conducted technology training and exercises with the 437th Medical Company Ground Ambulance at the Northern Strike Army National Guard Exercise at Camp Grayling, Michigan in August 2024.

Army Futures Command selected the two VISTA technologies for inclusion in Project Convergence Capstone 5, a joint multinational exercise to be conducted in the western United States and the U.S. Indo-Pacific Command theater this Spring. The U.S. Army Medical Research and Development Command (USAMRDC) Experimentation Integration Cell facilitated TATRC's participation in the event.

"The broad problem we're trying to solve with VISTA is how to provide forward care providers with the most accurate and timely information they need to provide appropriate care," says Nathan Fisher, chief of TATRC's Medical Robotics and Autonomous Systems division. "We're also looking to offload some of their cognitive burden by automating some of the documenting and monitoring tasks so that they can focus on their patients."

VISTA Point of Interest (POI) sensor and software payload can be installed on unmanned aerial systems to provide medics with a standoff casualty detection and monitoring capability. VISTA Patient Handling Automated Recording and Observation (POC) System, provides medical personnel with a contactless patient monitoring capability during field care or evacuation.

Fisher says the VISTA technologies are intended to address a crucial capability gap that has been a focus of research throughout USAMRDC: how to augment the capabilities of the limited number of medical providers that will be available to respond to future large-scale combat operations (LSCO) and mass casualty events.

More info: TATRC.org

STREAMLINING EVOLUTION OF CRITICAL MEDICINE FROM RESEARCH TO APPLICATION

COL Brianna Perata took command of the Walter Reed Army Institute of Research on 1 August 2025. She is an accomplished U.S. Army Nurse and California native. COL Perata earned her B.A. and M.A. in Nursing from the University of San Francisco and holds an M.S. in National Security Strategy from the National War College. COL Perata has 25 years of military leadership and nursing experience, most recently as the Assistant Deputy for Health Affairs, Assistant Secretary of the Army (Manpower and Reserve Affairs).

COL Perata's military education includes courses focusing on nursing, leadership and medical professional development, strategic thinking and planning, military operations and readiness, healthcare administration, ethics and legal compliance, and interagency and joint collaboration as demonstrated in her assignments.

COL Brianna Perata
Commander
Walter Reed Army Institute of Research
Silver Spring, MD

Combat & Casualty Care spoke recently with COL Brianna Perata, WRAIR Commander, regarding command efforts to help further modernize the Military Health System (MHS) while serving as a key player in safeguarding the health and readiness of the nation's globally-positioned military force.

C&CC: As the commander of WRAIR, what are your primary focus points and command priorities as you support the military services' needs?

COL Perata: As the Commander of the Walter Reed Army Institute of Research (WRAIR), my primary focus points and command priorities are nested under MG Paula Lodi's, the Commanding General of the U.S. Army Medical Research and Development Command (USAMRDC), strategic lines of effort. To achieve this mission, one of my top priorities is fostering a culture of continuous learning and professional development for both our military and civilian workforce. At WRAIR, we are committed to providing and maintaining opportunities that enhance the skills, knowledge, and well-being of our team members. This includes initiatives focused on Soldier development, such as health and wellness programs, leadership professional development training, and our civilian council to ensure that all members of our organization have access to resources that support their growth and resilience. Fellowship programs at WRAIR and its forward directorates provide hands-on experience and advanced training in critical areas of research and health security. Additionally, regular command touchpoints, and town halls are integral to maintaining alignment across the organization. These forums allow us to share updates, address concerns, and ensure that our team remains unified in its mission.

Another key priority is remaining true to our mission while embracing organizational transformation. As the operational environment evolves, we are ensuring research efforts remain relevant and address the emerging requirements of the Department of War, particularly in the context of maximizing force health protection, survivability and return to duty. WRAIR does this through its research and partnerships. WRAIR's elite team of U.S. and foreign civilians, contractors and military healthcare providers, medical researchers, and scientific leaders engage in over 900 partnerships with academia, U.S.G., DHA R&D, DHA Public Health, U.S.G. Foreign Service led by the DoS, DoW Geographic Combatant Commands, industry, and non-profit organizations to discover, design, develop, and deliver evidence-based, field-tested force health protection advancements.

C&CC: The MHS's strategic goals outline how it will become the world's role model of an integrated military system of health and medical readiness. The four goals: Take Care of Our People, Stabilize the MHS, Modernize the MHS, and Integrate MHS Capabilities provide a roadmap to effectively deliver required MHS capabilities. Can you explain how current WRAIR research contributes to achieving these goals?

COL Perata: WRAIR plays a vital role in safeguarding the health and readiness of our forces through its global presence and activities. During Operations Enduring Freedom and Iraqi Freedom, golden hour evacuations were a cornerstone of casualty care. However, on the LSCO battlefield, the most lethal Service members will be the ones durably protected against infectious diseases by countermeasures delivered prior to entry into theater that are not dependent upon a battlefield medical logistics system, which is highly vulnerable to enemy interdiction

A significant portion of WRAIR's work is conducted in the pre-deployment and preventive space; however, WRAIR's body of work spans all Roles of Care with research efforts aimed at developing material solutions, knowledge products, surveillance, global health engagements, and health security cooperation that can be implemented on the battlefield.

With a substantial global footprint, WRAIR conducts critical research and health engagements in regions that align with U.S. national security interests. Our work is conducted under established agreements with host nations and supports Geographic Combatant Commands through activities such as routine disease surveillance and health engagements. WRAIR researchers recently collected performance data at Bold Quest as well as conducted vector and disease surveillance efforts during exercises such as Cobra Gold 2025 and Justified Accord, providing critical situational awareness and informing preventative measures.

WRAIR's Center for Infectious Disease Research (CIDR) combines scientific expertise with product development capabilities to address the full range of diseases of national security importance to the U.S. Military. CIDR scientists, along with their collaborators, surveil the incidence and evolution of existing and emerging pathogens around the world to inform military leaders of endemic threats to their service members. These data are then used to inform and direct product discovery and development efforts.

WRAIR's Center for Military Psychiatry and Neuroscience (CMPN) is a translational and expeditionary effort to identify and eliminate brain health threats to service members. CMPN investigates methods to enhance psychological endurance and works closely with units to understand their mental health needs and deliver solutions. On a parallel track, CMPN works to identify the best solutions to understand, diagnose and treat Traumatic Brain Injuries (TBI) sustained from head impact or blast exposure.

WRAIR's Center for Enabling Capabilities (CEC) advances our medical capability and countermeasure development through provision of world class, cost efficient, and professional research support. CEC encompasses hundreds of military, civilian, and contractor personnel, and manages a multi-million-dollar research infrastructure and operating budget, consolidating the major research "enabling" assets of WRAIR, including the DoW's only Pilot Bioproduction Facility, as well as Veterinary Services, Clinical Trials Center, research library, and other activities. CEC also hosts the Medical Standards Analytics and Research (MSAR) program, which recently celebrated its 30th anniversary. MSAR provides policymakers with actionable data to shape evidence-based medical standards and has produced over 60 peer-reviewed journal publications and countless reports that offer valuable insights into medical readiness, adverse attrition, and disability evaluation.

WRAIR Commander, COL Perata, is seen here at the WRAIR-AFRIMS team in Yokohama, Japan for the Indo-Pacific Military Health Exchange 2025. Themed "The Future of Military Medical Interoperability: Building Resilience in a Changing World," the symposium provided team WRAIR with an opportunity to engage with over 1,100 military medical leaders from 22 nations to strengthen ongoing partnerships and develop new connections. These alliances are critical to building a future-ready, resilient military medical enterprise that promotes interoperability, safeguards our forces, and advances health security operations. (U.S. Army)

MG Paula C. Lodi, a United States Army major general who has served as commanding general of the United States Army Medical Research and Development Command (USAMRDC), salutes COL Brianna Perata as the 50th incoming Commander of the Walter Reed Army Institute of Research (WRAIR) during a change of command ceremony held at WRAIR in August 2025. (U.S. Army photo by Tyra Breaux)

Our ability to operate with varying levels of presence ensures that we remain agile and responsive to the needs of our military services. I am particularly proud of how these presences and efforts directly contribute to the integration of the MHS into DoW plans at the furthest possible points forward, and advance DHA's mission as a combat support agency.

C&CC: How has being part of the nurse corps influenced or informed your leadership style?

COL Perata: Being part of the Army Nurse Corps has profoundly shaped my leadership style, intertwining the values of care, service, and teamwork into every aspect of how I lead. As nurses, we answer the call to care for people in their most vulnerable moments. As Soldiers, we answer the call to serve and protect this great nation. For me, these two roles are inseparable. I am an Army Nurse, and you don't get one without the other. It's a dual identity that I embrace wholeheartedly, and it has deeply influenced how I approach leadership.

People often ask why I joined the Army, but I believe the more important question is why I've stayed. For me, the answer is simple: it's the people. The number one reason I've remained in the United States Army for over two decades is the incredible individuals I've had the privilege to serve alongside. The Army has a remarkable ability to shape and grow phenomenal teams, and I've witnessed firsthand how these teams come together to accomplish extraordinary things.

What I love most about the Army Nurse Corps is its ability to bring together people from all walks of life and meld them into a cohesive and dominant force. The Army Nurse Corps exemplifies the idea that when people unite under a shared mission and purpose, they can achieve greatness. This principle has deeply influenced my leadership style, teaching me to value and leverage the unique perspectives and talents of every team member.

As a leader, I strive to embody the principles of care and service that are at the heart of the Army Nurse Corps. I aim to create an environment where people feel supported, valued, and empowered to succeed. I believe that leadership is about building strong teams, fostering trust, and inspiring others to rise to their full potential. The Army Nurse Corps has taught me that leadership is not just about achieving results, it's about the people who make those results possible. It's about caring for them, serving them, and helping them grow.

C&CC: What is your leadership philosophy?

COL Perata: Leadership, to me, is about impact. It is not defined by rank, title, or position, but rather by the difference you make in the lives of others. True leadership is often forged in unexpected places, whether it's in a delivery room, on a battlefield, or in a boardroom. Over the past 25 years, I've come to understand that leadership is a journey shaped by three key principles: Grit, Growth, and Grace.

Grit is the foundation of courageous leadership. To have difficult conversations, the strength to make hard decisions, and the discipline to uphold high standards, even when it's challenging. Leaders have the responsibility to address issues head-on, even when it's uncomfortable. To be a courageous leader, we must take bold and calculated risks, even in the face of fear. Fear is a natural part of leadership, but by preparing thoroughly and taking deliberate action, we can transform fear into fuel for bold and decisive leadership.

Growth is another cornerstone of my leadership philosophy. It's about challenging not only your team but also yourself to rise to the occasion. Growth requires owning your mistakes, learning from them, and fostering an environment where others feel safe to do the same. Early in my career, as a young second lieutenant, I had the privilege of working under COL (ret) Kathleen Ford. She taught me a valuable lesson: great leaders don't stay confined to their offices. Instead, they work alongside their teams, learning and growing together. This hands-on approach fosters trust, collaboration, and mutual respect. Growth is also about seeking and giving feedback. I believe in asking for feedback from everyone, regardless of rank or position, and welcoming it with an open mind. Similarly, I make it a point to provide constructive feedback to my team, as it is a vital tool for personal and professional development.

Grace is about leading with humility, showing genuine care for others, and always expressing gratitude. Leadership is a collective effort that relies on a network of mentors, allies, and constructive critics. These individuals provide support, resources, and feedback, enabling us to lead more effectively. One of the most rewarding aspects of my career has been mentoring others. Watching someone I've guided step into their own leadership role is a powerful reminder that grace is about service. It's about empowering others to succeed and inspiring them to act courageously together.

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MAR 10 – 22
Joint CBRN Symposium
Washington, DC
Cbrn.dsigroup.org

MAR 24 – 26
Global Force Symposium
Huntsville, AL
Meetings.ausa.org/globalforce/2026/Reserve_booth.cfm

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

MAR 24 – 25
DMHD
London, UK
Defenceiq.com/events-deployedmedicalforum

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

APR 28 – 29
DoW/VA & Gov Health IT Summit
Washington, DC
Healthit.dsigroup.org

APR 28 – 30
Modern Day Marine
Washington, DC
Marinemilitaryexpos.com

MAY 11 – 14
MHS Conference
Minneapolis, MN
Mhsconference.com/event

MAY 17 – 20
Aerospace Medical Association
Denver, CO
Asma-uhms-asm.org

MAY 18 – 22
SOF WEEK
Tampa, FL
Sofweek.org

AUG 17 – 21
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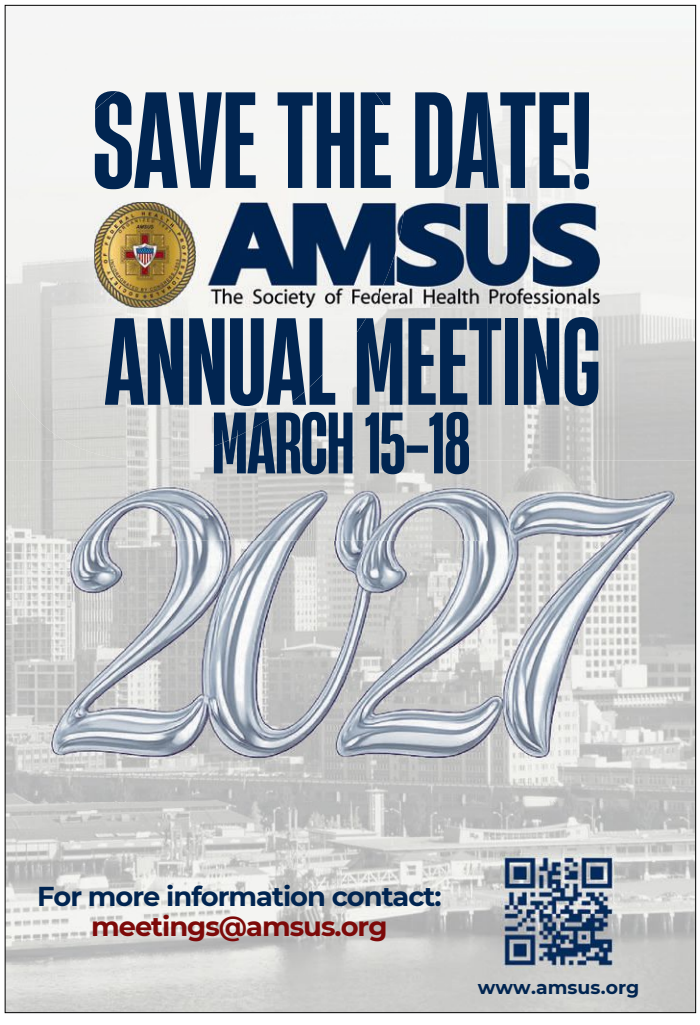

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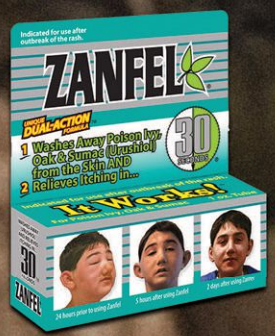

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