

# COMBAT & CASUALTY CARE

AUGUST 2022  
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Deputy Division Chief  
Thermal and Mountain Medicine Division  
U.S. Army Research Institute of Environmental Medicine



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Thermal and Mountain Medicine Division  
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### DIRECTOR'S CORNER

#### LTG Ronald Place

Director  
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Defense Health Headquarters  
Falls Church, Virginia



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### LEADERSHIP PERSPECTIVE

#### COL Mike Tarpey

Commander  
U.S. Army Aeromedical Research Lab  
U.S. Army Medical Research and Development Command  
Ft. Detrick, Maryland

**Cover:** Soldiers use teamwork to drag an ahkio sled loaded with 300-plus pounds of gear during the U.S. Army Alaska (USARAK) Winter Games at Fort Wainwright last February. As America's Arctic Warriors, USARAK Soldiers train hard to cultivate the knowledge and experience necessary to survive, train, operate, fight and win in extreme cold weather and high altitude environments. The games are an annual opportunity for USARAK units to test their skills, validate their expertise and set a benchmark of excellence for all Arctic Warriors to strive for. Battalions from both Joint Base Elmendorf-Richardson and Fort Wainwright were represented by 10-man teams for a total of 210 competing Soldiers in this year's games. (Army photo/John Pennell)

# COMBAT & CASUALTY CARE

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## INSIGHTS

As changes in global weather continue to challenge climate predictability, what civil society must cope with so must military. Some of the biggest advances being made today by the U.S. Department of Defense involve improvements to capabilities designed to mitigate threats posed by environmental conditions. As they say in combat, making Mother Nature your ally is half the battle.

The August 2022 issue of Combat & Casualty Care pays special attention to efforts by the U.S. Army Research Institute of Environmental Medicine (USARIEM), Natick, MA, unit of the U.S. Army Medical Research and Development Command (USAMRDC), Ft. Detrick, MD, to provide Soldiers and Joint Warfighters with capabilities that provide an edge under any combat conditions. From extreme heat to mind-numbing cold, current-day defense against the tyranny of temperature goes beyond inner and outer wear. In an exclusive interview with professionals at the Thermal and Mountain Medicine Division, USARIEM, Drs. John Castellani and Billie Alba speak to ways that just the pre-conditioning of an individual's dexterity with their hands and fingers promotes better blood flow and can make a big difference in frigid operational environments. Dovetailing off this research is the introduction of a new mobile application capable of determining what type of clothing might be best for given locations and certain weather conditions to help personnel avoid hypothermia. Not to exclude the opposing extreme since it is August after all, USAMRDC is leading efforts to field a mobile application that trains personnel to optimize activities that prevent the likelihood of heat stroke.

From environmentally-driven health concerns to the advancement of health force-wide, an exclusive interview with the Defense Health Agency (DHA), LTG Ronald Place, Director, provides insight into ways the DHA is optimizing the effective implementation of DoD's Military Health System (MHS) GENESIS electronic health record and supporting a proven Joint Trauma System that continues to improve positivity in casualty outcomes through the promotion of evidence-driven performance. Of course, what drives positive outcomes can come in the form of effective mobile-based care, or care neither at the point-of-injury or the treatment facility level. In an exclusive interview with COL Mike Tarpey, Commander, U.S. Army Aeromedical Research Laboratory (USAARL), subordinate lab of USAMRDC, readers get an inside perspective on USAARL's Enroute Care Research Program encompassing ground evacuation and aviation solutions in casualty movement and care. Partnering with industry like the Lovelace Biomedical Research Institute, USAARL is advancing positivity in long-term outcomes for those suffering from injuries such as traumatic brain injury, spinal cord, and hemorrhagic shock.

On the industry front, the August issue offers a look at unique capabilities in versatile backpacking, vertical lift-compatible litter, and powered air purifying respirator technology to protect us all from any number of deadly airborne contagions.

As always, we welcome any comments and thank you for the continued readership!

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# QUANTIFYING THE HYPERTHERMIC THREAT

The U.S. Army Research Institute of Environmental Medicine (USARIEM), Natick, MA, unit of the U.S. Army Medical Research and Development Command (USAMRDC), is focused on developing technological solutions to prevent and diagnose injuries to the Warfighter in a variety of environments and situations, with susceptibility to hyperthermia being a primary one.

By Ramin A. Khalili, USAMRDC



By combining physiologic monitoring with an algorithm designed to estimate core body temperature, USARIEM researchers are hopeful the iHOTT mobile application can determine how likely a person is to experience a heat stroke in the future. (Photo by Airman 1st Class Kathleen D. Bryant)

For Dr. Mark Buller, a USARIEM research physiologist, the work never ends because the possibilities are endless. As both the Army and the world at large become more reliant on technology to diagnose and mitigate potential environment-related injury, the efforts of Dr. Buller and his team have similarly become more integral to Service Member health, resilience, and overall mission success. That's what makes a new USARIEM mobile application, the Individual Heat Optimization Training Tool, or iHOTT, so important.

"You can train hard, sure – but whether or not you can train safely is the goal," says Buller, who is a principal investigator in the Thermal and Mountain Medicine Division (TMMD) at USARIEM. "The harder you train, you're taking on more-and-more risk – and that will mean heat illness, heat injury, and perhaps even a heat strokes; those are life-threatening situations for folks."

That's exactly why iHOTT was developed in the first place. It exists in many ways as the end result of a pair of different, though related, efforts. The first is a compilation of decades of research by USARIEM scientists to develop algorithms to assess the exertional heat illness risk of a given population of Soldiers; algorithms that, in simple terms, give a unit leader an assessment of how hot their Soldiers are getting via physiologic monitoring (which, among other data, analyzes a given Soldier's gait to spot signs of heat-related weakness). Combine that with an

algorithm designed to estimate core body temperature, and USARIEM is confident they've found a way to determine how likely a person is to experience a heat stroke in the future.

"When I was at a meeting at Fort Benning one time, I heard a two-star general say 'We can't remove the risk of heat stroke because we cannot stop training in the heat,'" says Dr. Nisha Charkoudian, chief of the TMMD, noting the realities of environmental risk. "So, we don't have an option to stop doing that training, and we cannot remove the risk – but we can minimize it with a tool such as this."

## ADDRESSING EVOLVING CHALLENGES

On the battlefield of the future, combat situations in a variety of urban environments will likely be unavoidable, and therefore are a variable which must be addressed to optimize the lethality of the force. With regards to hot or even tropical climates, a top concern for the military is exertional heat stroke (EHS): a life-threatening illness in which exercise, environment, clothing, and other factors combine to produce a large increase in body core temperature – often greater than 104 degrees Fahrenheit – as well as dysfunction in the central nervous system that may be identified as 'wobble' or, in scientific term, 'ataxia', as in a Soldier's movements. While advancements have been made in environmental monitoring and managing associated risk, EHS remains a problem for a slew of high-intensity activities, with heat strokes still occurring during some military training events.

As part of Buller's recent study on EHS, he collected more than 3,400 examples of high-intensity runs and timed ruck marches from more than 1,800 individuals – the vast majority of them from the Ranger Assessment and Selection Program, or RASP, as well as Marine recruits undergoing training at Parris Island, SC – using the Heat Illness Prevention System (HIPS), which is a suite of integrated tools that includes the iHOTT itself, as well as a chest belt (to monitor heart rate, skin temperature, and triple-axis accelerometry) and a real-time updating web page.

"We can use those tools in conjunction with each other to predict whether or not a given person is likely to experience a heat stroke," says Buller, noting the USAMRDC's Medical Materiel Development Activity (USAMMDA) was integral in developing portions of the HIPS system. "With runs and ruck marches, when we are using the estimated core temperature and the ataxic wobbly gate, we feel like we can predict accurately individuals who will experience heat strokes."

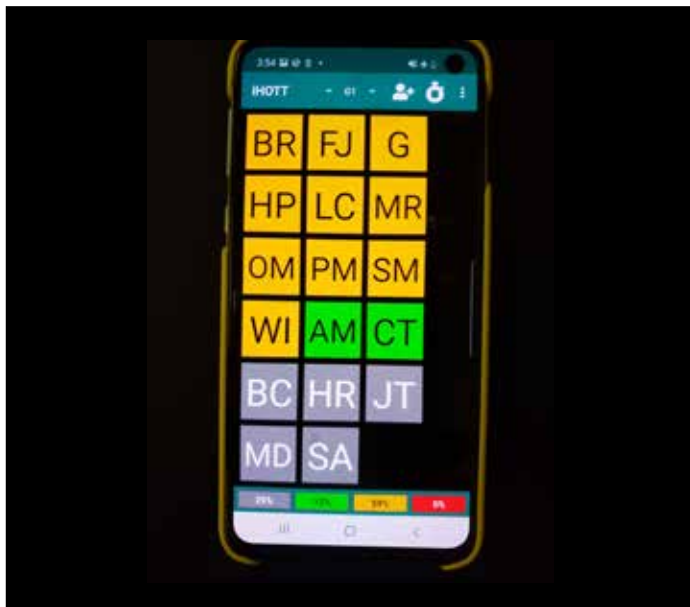
"We've heard previously from Commanders who would say, 'It's fine to say that 10 percent of people get heat stroke in these conditions – but how do I know which of my Soldiers is at risk?'" says Charkoudian, echoing the need to extract information at the individual level. "Mark's work is heading in that direction – perhaps to some extent it's still a work in progress, but we made a lot of progress. The people who have seen it have been really excited about it."



Dr. Mark Buller



Dr. Nisha Charkoudian



Screen image from the Individual Heat Optimization Training Tool (iHOTT), the new mobile application from USARIEM. The colors denote exertion levels for select Soldiers. (Photo by USARIEM Public Affairs)

Armed with these data, leaders – along with trainers and medics – can in turn assess those individuals in a variety of capacities using HIPS. In addition to identifying those Soldiers that are at risk for heat illness, leaders can also manage Soldiers at the individual level and in real time – the latter feature being the key to the entire system. From there, unit commanders can determine whether or not they need to change the tempo of a given activity or even insert a pause in activity altogether in order to more effectively manage training sessions.

### LOOKING AHEAD, PREPARING NOW

The challenge in the coming year, according to both Buller and Charkoudian, is to fine-tune their work with additional data. Already, massive data collection efforts are planned in cooperation with the 75th Ranger Regiment and the 198th Infantry Brigade (both from Fort Benning, GA), as well as the Marine Corps Recruiting Depot, Parris Island (Port Royal, SC). A key goal of the effort is to introduce participating Soldiers to the concept of monitoring the app and providing situational awareness. An additional goal of the study is to try and capture heat illness as it occurs to provide baseline data so that the team at USARIEM can learn how to apply those specific models to the collected data. The USARIEM team hopes to have enough data collected by the end of this year to move forward.

There are many other organizations outside of USARIEM that are invested in such progress. Buller notes that in addition to USAMMDA, he and his team have worked closely with the United Kingdom's Institute of Naval Medicine (where researchers are addressing a similar problem), along with the Massachusetts Institute of Technology Lincoln Laboratory, the Georgia Tech Research Institute, and a number of other federal and local government entities on the HIPS effort. Indeed, the iHOTT itself was developed in conjunction with USAMMDA's Health Readiness and Performance System tool, another recent sensor-driven health initiative. For Buller, such diverse collaboration is key to not only developing a tool with palpable impact for the individual Warfighter, but one that provides benefits across the Army and – possibly – beyond.

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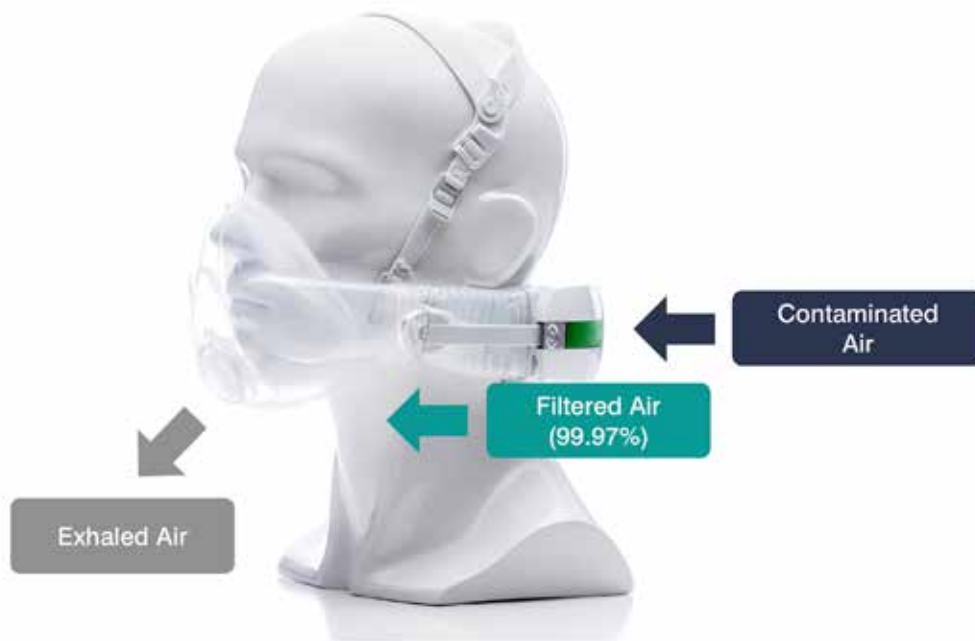
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# RESPIRATORY PROTECTION TO A NEW LEVEL

By Dr Alex Birrell, CEO and Steve Carlson, Director Government Solutions, National – CleanSpace Technology



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level PAPR protection where staff are trained, familiar and comfortable with using their respiratory protective equipment (RPE) in routine care across the hospital.

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# MITIGATING THE HYPOTHERMIC THREAT



*Dr. John Castellani is a Research Physiologist and the Deputy Division Chief, Thermal and Mountain Medicine Division, U.S. Army Research Institute of Environmental Medicine, Natick, MA. His research interests are in environmental and exercise physiology, including human thermoregulation and performance sustainment in cold weather environments, developing methodologies and techniques to*

*increase peripheral blood flow in the hands and feet during cold-weather operations, and improving hand and foot function. He is also involved in developing preventative guidance to decrease the risk of frostbite, non-freezing cold injuries, and hypothermia.*



*Dr. Billie Alba is a Research Physiologist, Thermal and Mountain Medicine Division, U.S. Army Research Institute of Environmental Medicine, Natick, MA. Her research is focused on the regulation of peripheral blood flow during environmental stress and examines the effects of physiological, pharmacological, and nutritional interventions on cold injury risk and manual performance in cold weather*

*environments. She has secured grant funding through the American Heart Association and U.S. Army Medical Research and Development Command Military Operational Medical Research Program.*

*Combat & Casualty Care spoke recently with Dr. John Castellani, Research Physiologist and Deputy Division Chief, Thermal and Mountain Medicine Division, U.S. Army Research Institute of Environmental Medicine (USARIEM), Natick, MA, and Dr. Billie Alba, a fellow Research Physiologist, Thermal and Mountain Medicine Division. The discussion focused on their current cold-weather research efforts, the concepts of vasodilation and vasoconstriction, and the impact of ischemic pre-conditioning on hand and finger blood flow in low-temperature environments.*

**C&CC: Can you explain a few current, modern-day challenges relating to cold weather (and cold injury) casualty care in both combat and non-combat scenarios?**

**Dr. Castellani and Dr. Alba:** There are many challenges for casualty care in cold weather. These include keeping patients warm in the field environment, administering intravenous fluids (fluids can and do freeze), setting up casualty collection points, moving patients across terrain, slower response times for medical evacuation and maintaining the level of warmth in medical tents required for treatment. For the medic and health care provider, one of the biggest issues is the loss of manual dexterity which affects their ability to treat casualties. They also need to keep fluids and medications warm so they remain efficacious, and further need to keep any metal surgical tools warm so the instrument doesn't cause contact frostbite because they are very cold. Another issue is that medical gloves can become brittle in very cold temperatures and can break, exposing the provider to biologics.

**C&CC: Please explain your work with the concept and practice of vasodilation. How does this method work, exactly – and what are challenges to its effectiveness?**

**Dr. Castellani and Dr. Alba:** The body's primary response upon entering a cold environment is to reduce blood flow in order to conserve heat.

This is known as vasoconstriction; blood vessels get smaller causing less flow. This protects us against hypothermia, but it also leads to low skin temperatures. With regard to the peripheral regions of our body, such as the feet and hands, this reduced blood flow can lead to functional changes such as impaired manual dexterity. Most people understand that in cold weather, they have a harder time using their hands. Vasodilation is the opposite of vasoconstriction; the blood vessels open up and blood flow increases. Our current work trying to improve manual dexterity is predicated on the concept that we can overcome cold-induced vasoconstriction and increase blood flow to the periphery.

**C&CC: From a nutraceutical perspective, speak to the variation from pharmaceutical-based treatment(s) and how this specific application addresses issues related to cold weather performance for Soldiers.**

**Dr. Castellani and Dr. Alba:** Pharmaceutical agents are primarily used to treat cold injuries, such as frostbite. They are not routinely used to prevent vasoconstriction and improve hand function in the cold. Pharmacologics are, however, sometimes prescribed in individuals who suffer from Raynaud's Phenomenon, a clinical condition that is characterized by excessive reductions in blood flow to the hands and feet when exposed to cold temperatures. While drug therapies can be effective in improving symptoms of Raynaud's Phenomenon and can inform us on molecules to target for lessening cold-induced vasoconstriction; current drug therapies often include oral vasodilators that are associated with adverse side effects – for example, hypotension and headache – and require careful dosing. Therefore, we are interested in exploring more targeted countermeasures and nutraceutical approaches that improve blood flow in the hands and feet but do not have significant systemic side effects. For Soldiers, nutraceuticals have the potential to provide a safe and effective solution and, moreover, can be incorporated into cold-weather rations without adding to Soldier load and burden.

**C&CC:** In terms of enhancing dexterity to avoid injury (and presumably to improve function) in cold weather environments, what are your current areas of research – and how, exactly, will you apply those to real-world environments?

**Dr. Castellani and Dr. Alba:** Our current areas of research to improve dexterity are tackling the problem from both a technological and physiological solution. For the technological approach, we are working on methods to deliver exogenous heat to relatively small body areas that will lead to an increase in hand and finger temperature and manual dexterity. We have completed proof-of-concept work showing that applying heat to the forearm increases hand and finger temperatures by about three degrees Celsius; efforts which led to a 20-50% improvement in gross and fine motor dexterity and a 90% improvement in finger strength. We recently built a prototype at USARIEM to bring to Operation Arctic Eagle/Patriot in Alaska in February so that we could receive user feedback to help with further design. We hope this effort will transition to advanced development soon.

For the physiological approach, we have multiple efforts currently taking place. In fact, we recently completed one such effort using cocoa-based bioflavanols to improve finger temperatures. Other research showed these compounds impact peripheral blood flow, but this was not tested in cold conditions. We studied the effects of the bioflavanols on the cold-induced vasodilation response, but we found that it not improve Cold-Induced Vasodilation (CIVD) or finger temperatures. We are also examining the effects of multiple days of cold exposure on the peripheral blood flow responses to cold and the physiological mechanisms that change due to multiple cold exposures. Once we have a better understanding of how repeated cold exposures impact blood flow response to the hands and fingers, we can develop specific countermeasures and training protocols to help Soldiers improve dexterity and hand comfort. Finally, we are going to examine the effect of ischemic pre-conditioning on hand and finger blood flow. Intermittent Pneumatic Compression (IPC) is a protocol where blood flow is occluded for five minutes using an applied cuff which is then released. This pattern of occlusion-and-release is repeated for a total of 30 minutes. This ischemia-reperfusion causes profound vascular changes that we believe will improve vasodilation in cold conditions, leading to higher hand and finger temperatures and better manual dexterity.





**C&CC:** What are some other similar or related projects USARIEM is focusing on going forward?

**Dr. Castellani and Dr. Alba:** USARIEM has a comprehensive program across all of our research divisions to reduce cold-weather injuries and improve human performance in cold-weather/Arctic environments. We have developed applications to enable Warfighters to choose the right cold-weather clothing based on environmental temperatures and mission set (the Cold-Weather Ensemble Decision Aid), as well as have developed the Probability of Survival Decision Aid to help search and rescue efforts determine the probability of hypothermia. We have several research projects examining the physiological responses to cold-wet environments (e.g., raining, emerging onto land after being immersed) as well as during cold-water immersion. We will develop guidance from these studies to lower the risk of hypothermia. Other efforts will develop novel work-rest cycles to improve operational performance and reduce susceptibility to injury, develop countermeasures in fatigued Soldiers during cold-weather operations and examine genetic markers

to understand which Soldiers are most at risk of a cold-weather injury. USARIEM is also working on using multiple cold-water exposures to improve health and performance when exposed to high-altitude environments. USARIEM is also teaming with various industry partners to develop nanofibers to measure peripheral temperatures in gloves and other equipment. Finally, USARIEM is the lead agency on the revision of Technical Bulletin MED 508, "Prevention and Treatment of Cold-Weather Injuries". This is the official Army guidance for preventing and treating all cold-weather injuries. This revision is comprised of a 25-member team consisting of Army, Air Force, and Special Operations Command medical providers, as well as clothing developers and training/operational personnel – all of whom provide input.

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# RESPECTING COLD THROUGH PREPARATION

With more than ten years of research and advanced knowledge of clothing biophysical properties, Dr. Xiaojiang Xu, biophysical mathematical modeler with the Thermal and Mountain Medicine Division, U.S. Army Research Institute of Environmental Medicine (USARIEM), unit of the U.S. Army Medical Research and Development Command (USAMRDC), is developing a user-friendly computer application noting specific clothing items Warfighters should wear based on environmental conditions and planned activity levels. The Cold Weather Ensemble Decision Aid (CoWEDA) app uses a series of inputs to make recommendations to reduce the risk of hypothermia and frostbite.

By Carey Phillips, USARIEM



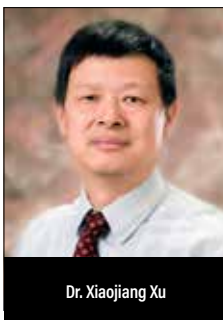
Paratroopers from C Company, 3rd Battalion, 509th Parachute Infantry Regiment attack the Combined Arms Collective Training Facility in the Donnelly Training Area, Alaska, last year as part of Exercise Arctic Warrior. (Army photo/John Pennell)

Are you dressed warmly enough? This is a question you've no doubt heard millions of times as the season turns cold. For Warfighters operating in cold-to-extreme-cold environments, however, knowing the answer to this question – that is, what to wear in relation to the specific environmental conditions – can go a long way to reducing risk of serious illness and potential injury.

Warfighters, of course, deploy around the world – including to regions featuring sub-zero temperatures. As such, Warfighters need to know exactly which clothing items to wear in those environments so they can, in turn, more safely and more effectively accomplish their mission. Knowing what to wear is far more complicated than dressing for work; it is the first step in creating and maintaining a ready and resilient force.

“How does a Soldier select the clothing they need when they go into cold environments?” said Dr. Xiaojiang Xu, biophysical mathematical modeler with USARIEM, noting

that current evaluation of cold weather ensembles is often based on anecdotal experiences, or even simple charts and tables, none of which fully address the need for cold protection. “CoWEDA integrates physiology knowledge, a thermoregulatory model, and a database and algorithms of clothing biophysical properties into a single user-friendly software application. The app has to be user-friendly, and requires no scientific knowledge to use it. That was the starting point.”



Dr. Xiaojiang Xu

## PROACTIVE READINESS TO AVERT CONSEQUENCE

Cold weather injuries such as hypothermia or frostbite can be severe, life-changing and fatal – but most importantly, such injuries are preventable. There are more than 500 cold-weather injuries reported by Warfighters each year. The CoWEDA app improves Warfighter awareness of their operating environment, and further



Screen images from USARIEM's Cold Weather Ensemble Decision Aid (CoWEDA) mobile application, featuring clothing suggestions for a given Soldier based on environmental factors entered via the dashboard on the left side of the screen. (USARIEM)

provides guidance on how to dress appropriately to reduce the risk of cold-weather injury.

"What I hope is that this app can reduce that number," Xu said of the aforementioned injuries. "If you head into cold-weather environments and you don't prepare, you will be in trouble; once you're outside in the cold, there's really not much you can do anymore. That is the purpose of the app – to tell people about potential danger and prepare them."

Notably, CoWEDA allows Warfighters to build their own ensembles from their current clothing inventory. Based on user inputs, the app provides clothing recommendations for each of the five body regions: head, upper body, hands, lower body and feet. CoWEDA then interprets those selections in terms of cold injury risk and safe operation times, letting the Warfighter know when exposure to each body part becomes critical. Clothing performance is evaluated by the requirements to prevent frostbite, prevent hypothermia and avoid excessive sweating.

"We have figured out a way to connect a selected clothing item to the physiological consequence," said Xu. "For instance, different gloves could mean the difference between comfort or pain in the same cold condition. CoWEDA directly relates a selected clothing item to the physiological response so the user knows what will happen if they don't wear proper clothing. When the hand temperature drops in the cold then the hand will feel cold, pain, numbness and lose the capability to perform different tasks. They will know what kind of clothing they will need to avoid injury or pain."

To that end, Xu notes his team has been working with clothing manufacturers for several years, asking questions that relate to a given piece of clothing's performance and capability in extreme temperatures.

"What is the definition of good or not good?" said Xu. "The existing methods are not good enough to present the protection level an ensemble provides. Our team figured out a human-centric approach to evaluate the performance of the cold weather ensemble. The thermal performance of cold ensembles were defined as endurance times instead of insulation values to represent the protection level an ensemble provides."

Clothing supports and is meant to protect people from cold-weather injury. Cold-weather injuries can have different forms (including frostbite or hypothermia, for instance) but all are serious.

"We have worked out a way to evaluate the performance of cold-weather ensembles," Xu said. "If the existing methods of cold weather ensemble evaluation are limited and provide incomplete

guidance for determining clothing items and preventing cold injuries then how would the individual know what clothing to choose?"

Indeed, this is where the idea of developing such an app came from; the ultimate goal being to provide the individual user with a method to understand which particular clothing ensemble will provide the best protection against cold injuries while also avoiding overheating during exercise in different cold-weather environments.

## PRACTICE EQUALS PREPAREDNESS

In 2021, the team provided the CoWEDA app to the 4th Brigade Combat Team (Airborne), 25th Infantry Division to help prevent cold weather injury during the Arctic Warrior 21 Exercise at Joint Base Elmendorf-Richardson in Alaska. During the exercise, weather conditions ranged from negative five degrees to negative 40 degrees Fahrenheit. In the end, data collection showed the CoWEDA had a substantial positive impact; according to recently-published research, the app predicts both the risk of frostbite and hypothermia, and ensures that a selected clothing ensemble is, indeed, appropriate for expected weather conditions and activities.

Due to the success of the computer-based testing, the app has been pushed to USAMRDC's U.S. Army Medical Materiel Development Activity's Warfighter Health, Performance, and Evacuation Project Management Office to convert it for access on smartphones. Once the smartphone version is ready, the CoWEDA app will be tested in units working in and deploying to cold-weather environments.

CoWEDA is designed to supplement information found in the Army Technical Bulletin – Medical 508, entitled, "Prevention and Management of Cold-Weather Injuries." The TB MED 508 provides guidance for cold-weather conditions to military and civilian healthcare providers. The TB MED includes topics such as how the body responds to the cold, how Soldiers should prepare when deploying to the Arctic and how to mitigate and treat different cold weather injuries.

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3. Flynn, E.A., Barker, K.N., & Carnahan, B.J. (2003, March–April). "National observational study of prescription dispensing accuracy and safety in 50 pharmacies." *Journal of the American Pharmacists Association*, 43(2):191–200. <https://pubmed.ncbi.nlm.nih.gov/12688437/#>  
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# ADVANCING THE FUTURE OF MILITARY HEALTH

*Lieutenant General Ronald J. Place, Director of the U.S. Department of Defense's Defense Health Agency (DHA). Located in Falls Church, Virginia, the DHA supports the National Defense Strategy and Service Military Departments by leading the Military Health System (MHS) as an integrated, highly-reliable system of medical training, readiness, and health. The DHA directs the execution of ten joint shared services to include the TRICARE health plan, pharmacy, health information technology, research & acquisition, education & training, public health, medical logistics, facility management, budget resource management, and contracting. The DHA also administers the TRICARE Health Program which provides worldwide medical, dental and pharmacy programs to more than 9.6 million uniformed servicemembers, retirees, and their families.*

*By the end of 2022, the DHA will have reached critical milestones in the transformation of the MHS that has defined the last few years. Combat & Casualty Care spoke with LTG Place about what's next for the Agency when it comes to research and development that will benefit the warfighter.*



**C&CC:** Before we talk about the future state of research and development at the DHA, can you level set the current state of the Military Health System and DHA?

**LTG Place:** In broad terms, the Military Health System (MHS) is many types of health systems in one. It's a hospital system, an outpatient health system, a health benefit plan (TRICARE), a public health system, an educational system, and a medical research and development system. This "system of systems" is what keeps service members healthy and cares for them when they're wounded, ill, or injured. It's a large, complex, international system with expertise across every single component of the larger U.S. health system.

The Defense Health Agency is a joint, integrated Combat Support Agency that enables the uniformed medical services to provide a medically ready force and ready medical force to Combatant Commands in both peacetime and wartime. We follow the principles of High Reliability Organizations across the MHS, which helps us deliver high-quality care to our beneficiaries. By the end of September, we'll have completed the transition of military hospital and clinic management from the Military Departments to the DHA. And we will have rolled out MHS GENESIS, our new electronic health record system, to the majority of those military hospitals and clinics.

Unlike private sector health care organizations, we routinely send service members into harm's way. This means we have an obligation to protect them from illness and injury. It's critical that we have cutting-edge capabilities to treat individuals in locations where a young medic

## LTG Ronald J. Place

Director  
Defense Health Agency

may be the most qualified medical expert within hundreds of miles. It also means we have the ability to move injured service members thousands of miles when no one else would dare try to aeromedically evacuate a patient. Our need to anticipate threats and opportunities that lie ahead are at the heart of why we maintain a robust research program.

Hopefully, this helps explain the immense responsibilities of our system, and why our research and development activities are so vital to United States national security, and to the general advancement of medicine.

**C&CC:** So, what's next?

**LTG Place:** By the end of September, we'll be a joint operational headquarters responsible for managing, executing, and delivering high-quality health care, medical education and training, military medical research and development, and public health support to our 9.6M beneficiaries and the Services. We're moving from the transition phase of these changes to the execution phase.

We'll continue to mature and expand our capabilities as a Combat Support Agency, optimize the MHS, and drive improvements in

operational support for the Combatant Commands. To do this, we'll integrate operations with partners in other federal agencies, particularly with the Department of Veterans Affairs, and optimize our civilian health care partnerships. When it comes to research and development, the Army, Navy, and Air Force each have vital research portfolios. Over the next couple of years, we'll be standing up a joint, integrated R&D program, allowing us to leverage the research enterprise to ensure we provide the best possible care for our warfighters and their families.

**C&CC: How has the MHS Transformation impacted medical research, acquisition and development?**

**LTG Place:** I'll use the Joint Trauma System (JTS) as an example. The mission of the JTS is "to improve trauma readiness and outcomes through evidence-driven performance improvement." In simpler terms, ensuring every injured service member has the best chance for survival and recovery. It means we're developing products to reflect the best medical expertise we have, regardless of what uniform they wear, or whether the expert is military or civilian.

Then, we need to invest in Knowledge Translation, to accelerate what we learn at the bench and move it to the battlefield and the bedside. We are using some of those Knowledge Translation products to ensure our practitioners follow evidence-based practices to reduce post-partum hemorrhage, or increase the co-prescribing of naloxone when we prescribe opioids.

One of the technologies we recently transitioned from our research portfolio to our acquisition program is a Next Generation Diagnostic System for diagnosing infectious diseases in the field to aid in the diagnosis of malaria, dengue fever, and leptospirosis. Some of the great advances being made to combat malaria today are thanks to several decades of military medical research.

**C&CC: As a Combat Support Agency, how has the DHA been able to improve support for the Combatant Commands?**

**LTG Place:** The DHA supports military operations in more ways than can be described here, but that support especially comes from DHA elements such as the Armed Services Blood Program, JTS, and the Armed Forces Medical Examiners System. Our military hospitals and clinics are readiness platforms that keep our military forces ready to perform their mission and allow our military medical personnel to sustain and improve their clinical skills for deployment. But, for your audience, I'll focus on medical research and development.

The future of warfare drives our research investments. Over the next few years, we could face a broad range of conflicts requiring different capabilities, all while dealing with new and complex casualties from advanced weapons and a changing environment.

For example, air superiority may be a challenge on the future battlefield. That may mean the "Golden Hour" doctrine of rapid medical evacuation from the battlefield isn't possible. We may need to treat casualties in place, for extended periods of time. So, we're developing lifesaving, portable tools that we can use far forward. We're leveraging patient triage capabilities, predictive analytics, and machine learning, all with an eye to extending treatment capability. We're also working to monitor airborne health hazards through wearables meant to protect the health and safety of the warfighter, studying the value of sleep, and the social-psychological consequences of combat.

We recently transitioned technologies that allow us to extend the shelf life of cold-stored platelets produced at Department of Defense



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Navy Lieutenant Caroline Mosher, a nurse anesthesia student at USU's Graduate School of Nursing, conducts "proof-of-concept" testing using the COVID-19 Airway Management Isolation Chamber, or CAMIC. (DHA photo/Lt. Col. Robert Long)

(DoD) blood banks or platelets supplied by civilian blood banks. We also made our open-source Tactical Combat Casualty Care (TCCC) curriculum available on mobile apps to support everyone on our medical teams, from medics and corpsmen to nurses and surgical specialists.

During COVID-19, the Health Protection Condition (HPCON) levels framework provided critical guidance to operational commanders and installation commanders, enabling them to make critical decisions to support the health and readiness of their forces. HPCON is a great example of the power of partnership, of developing strategies and working together to find joint solutions.

**C&CC: It looks like COVID-19 will be with us for a while. How has the DHA's response to the pandemic influenced research and development?**

**LTG Place:** Much of what we learned over the last two years applied before COVID, although the pandemic certainly increased the urgency. DoD called upon us to respond to, and help lead, research and development of vaccines and therapeutics, testing, treatment, and vaccination efforts. It was a stark reminder of the connection between disease and readiness.

COVID was an opportunity for the DHA and the Services to work together to find joint solutions to protect the health of the force. We already knew how to integrate care, and the way that we were set up within the MHS provided a framework that helped us support the pandemic response both inside and outside of the DoD. In November 2020, we used that knowledge to establish and lead an Operational Planning Team (OPT) of nearly 85 representatives from across the DoD. The OPT developed and executed a complex plan to safely and effectively administer vaccines to the DoD's globally dispersed population. That level of collaboration wouldn't have been possible without an inter-service effort and the personnel in the field.

The OPT's success truly shows the value of the DHA in its role as an operational combat support agency. Our ability to bring together a successful and effective team, and work with the services to support the needs of the Combatant Commands and other DoD agencies and field activities, is a model we can leverage into the future as we mature our processes to support future joint research and development efforts.

It also confirmed that the DoD is on the right path as we used our new organizational structure to collaborate with our partners and drive innovation. We built out new capabilities, implemented new patient-care techniques, and launched massive new research efforts. This includes a new registry for real-time COVID-19 data that now track hundreds of thousands of patients and their outcomes, as well as devices to protect health care personnel from disease.

Researchers from the U.S. Army Combat Capabilities Development Command's Army Research Laboratory and the University of Pittsburgh Medical Center created an individual biocontainment unit that uses negative pressure to suction the air from around a patient and filter out viral particles. To keep aircrews safe while transporting COVID patients, the Air Force developed the Negatively Pressurized Conex that surrounds patients within a negatively pressurized containment system. And working with teams from across the MHS, a surgeon from the Uniformed Services University and Walter Reed National Military Medical Center developed a similar device – the COVID-19 Airway Management Isolation Chamber, or CAMIC – that captured and removed viral particles emitted by patients.

To help COVID patients breathe more easily while on ventilators, Keesler Air Force Base in Mississippi prototyped a pronating shelf with cut-outs for the patient's face. This design helped patients breathe while lying prone (face down) on ventilators. As global ventilator supplies dwindled, the Naval Surface Warfare Center Panama City Division in Florida developed low-cost, easily-assembled ventilators that personnel in both the field and hospital settings could easily replicate.

While the COVID-19 pandemic highlighted the need for continued operational medical innovations, the DoD is also looking to ensure we track the course of the disease and its effects on service members.

One research effort led by the Naval Medical Research Center has moved into a new phase. The CHARM -- COVID-19 Health Action Response for Marines -- study was instituted to assist the Marine Corps in managing the initial COVID-19 outbreak at recruit depots in May 2020. The study helped monitor the health of recruits who tested positive for the virus. Now, more than two years later, a second iteration of the study has been launched to follow up and monitor symptoms those recruits – now in the Fleet Marine Force – may be experiencing. Studying the long-term effects of COVID-19 today may play a critical role in developing the therapeutics of tomorrow.

We know COVID-19 will continue to evolve. We need to not only address the current pandemic, but develop a next generation vaccine that can act as a first line of defense against variants of concern and similar viruses that could emerge in the future. More than anything, COVID-19 showed us that support for our warfighting capabilities requires a joint effort across the DoD.

**C&CC: Can you tell us about any projects in the research, acquisition, and development pipeline?**

**LTG Place:** We support approximately 25 modernization and upgrade efforts per year. In the pipeline today is a device to calibrate numerous ventilators in a variety of medical settings; a portable operating table designed for surgical procedures in far forward operations; an ultrasound device used for rapid diagnosis of injuries; posttraumatic stress disorder and acute stress disorder screening tools; and blood plasma freezers. Needless to say, there's a lot of exciting products and tools in the works.

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## FACILITATING CONTINUOUS MOBILE CARE FROM THE AIR

*COL Michael Tarpey enlisted in the Army as a combat medic in 1989. He served as a medic with Air Defense Artillery units in Germany and deployed as a medic with 1-7 Patriot missile battery in the first Gulf War. He later served as an evacuation NCO with 1-502nd Infantry, 101st Airborne Division.*

*COL Tarpey is a graduate of Stanford University with a Bachelor of Arts degree in Political Science. He earned a Doctorate of Medicine degree from the University of Illinois School of Medicine in Chicago, IL. He completed a Family Medicine residency at Cook County Hospital in Chicago, IL and a fellowship in Family Medicine Obstetrics at CRDAMC, Fort Hood, Texas.*

*COL Tarpey's previous assignments include Battalion Surgeon for 1-15 Infantry, 3rd Infantry Division; Brigade Surgeon for 1st Brigade, 82nd Airborne Division; Group Surgeon for 3rd Special Forces Group; Officer in Charge of the Russell Collier Clinic, Fort Hood; Division Surgeon for the 82nd Airborne Division, Commander of the Tuttle Army Health Clinic, Hunter Army Airfield; Corps Surgeon for III Corps; and Chief of Clinical Operations, Primary Care Service Line, Office of the Surgeon General.*

*He is a graduate of the AMEDD Officer Basic and Advanced Courses, the U.S. Army Command and General Staff College, and has completed a U.S. Army War College Fellowship at George Washington University.*

*COL Tarpey has deployed twice to Afghanistan in support of Operation Enduring Freedom, three times to Iraq in support of Operation Iraqi Freedom, and once to Iraq in support of Operation Inherent Resolve.*



**COL Michael Tarpey**

Commander  
U.S. Army Aeromedical Research Laboratory  
U.S. Army Medical Research  
and Development Command

*Combat & Casualty Care had the chance to speak with COL Michael Tarpey, Commander, U.S. Army Aeromedical Research Laboratory (USAARL), Ft. Rucker, AL, subordinate lab of the U.S. Army Medical Research and Development Command (USAMRDC), Ft. Detrick, MD. Our conversation focused on a number of topics, including USAARL's efforts to address the need for mobile casualty care solutions on a truly global scale. The laboratory is helping incorporate lessons learned in real world scenarios into a streamlined package of tools and protocols to help reduce critical gaps in care.*

**C&CC: How is USAARL working to solve current challenges with regard to medical evacuation in urban and austere environments? Which specific tools and technologies are you using to tackle these obstacles?**

**COL Tarpey:** Many of the questions involving casualty evacuation in urban and austere environments are not unique to the enroute care environment, or are not medical research issues, per se (for example,

armor or defensive systems). However, USAARL's Enroute Care Research Program is studying several relevant concerns in urban and austere environments. First, USAARL has responsibility for ground evacuation research as well as aviation issues, so we've collaborated with Lovelace Biomedical Research Institute researchers at Kirtland Air Force Base to create a ground ambulance test track to study the effects of a rough ride on the outcome of patients with traumatic brain injury, spinal cord injury and hemorrhagic shock. Second, in the austere and prolonged multi-domain operations environment, air superiority will no longer be assured. This means prolonged ground time waiting for evacuation and longer inflight missions, so there are some very real concerns about severe fatigue in our care providers.

We've also proposed research to assess these problems and, in turn, develop countermeasures to enable our critically important providers to function in a prolonged care scenario. USAARL is working on collaborative efforts with both USAMRDC's Telemedicine and Advanced Technology Research Center and the Medical Material Development



Activity concerning the use of telemedicine and remote closed looped care of patients. These efforts will enable providers at a higher level of care or those in a certain specialty to advise far forward medical providers or even to remotely perform interventions on patients. These are just a few examples of ongoing and planned research that are relevant to casualty evacuation (CASEVAC) in urban and austere environments.

**C&CC:** On the topic of forward deployed medical evacuations, what are some key challenges to effectiveness and how is USAARL addressing those challenges?

**COL Tarpey:** In the Multi-Domain Operations (MDO) environment, there is the possibility for significant numbers of casualties that require evacuation to forward surgical teams and field hospitals. Future vertical lift is one of the Army's six modernization priorities and will play an important role in improving the ability to quickly and efficiently evacuate casualties from the battlefield. USAARL is working closely with the FVL Cross Functional Team as future aviation platforms are developed that will enable our pilots to fly farther and faster than ever before. Much of our research is focused on optimizing both the protection and the performance of aviators who will fly these new helicopters, including the Future Long Range Assault Aircraft MEDEVAC aircraft (FLRAA).

FLRAA MEDEVAC will evacuate patients at a significantly increased range within the golden hour (or, the integral first hour after the occurrence of a traumatic injury.) USAARL recently hosted a

MEDEVAC Mission Equipment Package Summit including key leaders from the Future Vertical Lift Cross-Functional Team (FVL CFT), USAMRDC, and other important aeromedical evacuation organizations. Representatives from across the enterprise presented a detailed path forward including the use of technology demonstrators, Soldier touch points and prototypes that are modular, lightweight and rapidly adjustable. Participants identified key funding, design knowledge and decision points to enable a final design that will be relevant and useful for medical providers of all skill levels.

The concept of forward deployed MEDEVACs will put the MEDEVAC assets further away from supplies and medical backup, but the strategy makes sense in the MDO environment, in which medical personnel may not be able to get to wounded casualties for extended periods of time. Of course, this puts more pressure on far-forward combat medics and other medical personnel, who may be required to operate independently for extended periods of time, caring for multiple severely wounded casualties.

One way that USAARL is directly enabling prolonged, far-forward care in MDO relates to the transport of essential medical supplies, by air, in highly contested airspace. Supplies like blood products, clotting agents, and various drugs will be essential for casualty care in MDO. One way to move essential medical supplies to the front during dynamic combat is via unmanned aircraft systems. Vital supplies could be transported to where they are needed, without placing human aircrews at risk. Someday in the future, unmanned air systems (UAS) may even be used to transport casualties; USAARL is working on ways

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Pilots wear N95 masks during a testing effort at the U.S. Army Aeromedical Research Laboratory, Ft. Rucker, AL. (USAARL)

to “tune” the mission plan and dynamic flight movements of a future UAS platform to the particular physiological needs of a transported casualty with specific injuries. This research has the potential to produce interim products that can be used on existing MEDEVAC and CASEVAC vehicles.

**C&CC: As the Department of Defense places more emphasis on ‘care in the air’ – especially with regard to CASEVAC for future MDO – how is USAARL addressing and ensuring the readiness of flight medics and medevac aviators?**

**COL Tarpey:** Increasing the inflight medical care responsibilities of Army flight paramedics, as part of the MDO strategy, will require even more training (both initially and on a continuing basis) to ensure clinical competency when it is needed for casualty care. This will continue to be a tremendous challenge to Army Medicine. When there are research issues associated with inflight medical care skill training, USAARL will be ready to assess level strategies to learn and maintain care provider skills. We collaborate very closely with the School of Army Aviation Medicine on these issues.

In the meantime, we are focusing on maximizing the effectiveness of flight medical crews in a variety of ways. First, we’ve conducted a series of research projects to determine the space and time required to perform the full range of paramedic care skills in both ground and air ambulances, and the maximum number of urgent patients the flight paramedic can give care to during a standard MEDEVAC flight. These recommendations have been shared with the program managers responsible for the acquisition requirements of patient movement platforms. These studies have also produced quantifiable metrics of flight paramedic performance during realistic MEDEVAC scenarios.

USAARL has also completed studies of flight paramedic occupational injuries during the patient loading and unloading process, which was identified as a high-risk task in field surveys of operational

flight medics. The results of these studies will be delivered to the designers of patient loading and unloading equipment and procedures.

Finally, we’re conducting research to make it easier to monitor critical patients in the noisy helicopter cabin environment. One recent study asked the question, “What if the flight medics were able to hear monitoring device alarms in their flight helmet sound system, instead of relying solely on visual indications of a patient device malfunction?” So far, the results strongly support this innovation, and future studies will investigate three-dimensional audio as an optimal way to provide additional cues to the flight medic.

**C&CC: With the continuum of care for trauma – both combat and non-combat – challenged by limitations of life support during patient movement, what are some focus areas for bridging interruptions to critical treatments?**

**COL Tarpey:** There have always been challenges bridging the different levels of CASEVAC. For now, USAARL’s medical equipment certification and evaluation program plays a critical role in the acquisition of medical equipment for use on Army helicopters. Every item of carry-on aviation medical equipment is required to undergo dozens of tests at USAARL before being recommended for an airworthiness release, which allows the device to fly on Army aircraft. This program is well coordinated across all military services, so sometimes USAARL will test an item being procured by the Air Force, and vice versa. Targeted testing of carry-on medical items, specific to ground and sea platforms, can also be included as part of a comprehensive program, saving time and funding in the testing phase of an acquisition program. This cooperation across the services provides a common framework for equipment testing—that’s a step in the direction of seamless sharing of medical equipment during CASEVAC.

Recently, USAARL tested a number of innovative new technologies that have the potential to improve the care provided to critically injured



COL Tarpey speaks to group of attendees about USAARL initiatives during an event at the 2022 USAMRDC Capability Days, Fort Detrick, Maryland. (USAMRDC)

patients during the evacuation continuum. New refrigerator and freezer technologies to move fresh whole blood forward and ultrasound devices that can remotely diagnose intracranial hemorrhage are two prominent examples. In addition, new patient monitoring technologies, which improve medical documentation and communication between medical providers at different levels of evacuation, provide promise of improved information exchange during evacuation.

**C&CC: From a standardization challenge perspective, what are key points USAARL sees as integral to the establishment of a common system for joint air medical standards across the DoD?**

**COL Tarpey:** The challenges of establishing joint air medical standards that would apply across the DoD are multifactorial. What aspects of CASEVAC and transport are amenable to standardization? There are standards for clinical practice, which should reflect the best treatment strategies determined by expert consensus, with the caveat that in the initial stages of evacuation, the equipment and expertise available could vary among different services (an infantry platoon versus deck personnel on an aircraft carrier, for example). Once the casualty enters the MEDEVAC chain, the modes of available transportation and performance requirements differ across military services.

The 2012 Joint Enroute Care Equipment Test Standards, coauthored by USAARL, describes the test methods required for airworthiness certification by DoD joint services. This document provides a common understanding of inter-service equipment performance and test requirements. The need for specific service acquisition requirements will continue until the seamless transfer of medical equipment is supported by DoD acquisition policies.

**C&CC: Are there any areas of recent, additional areas of achievement at USAARL that you would like to discuss?**




**COL Tarpey:** One of USAARL's primary areas of focus over the last two years is Project Convergence 2021 (PC21), the Army's "campaign of learning" designed to further integrate the Army into the Joint Force, led

by Army Futures Command. In PC21, USAARL used internal resources to coordinate with Joint Modernization Command, Army Test and Evaluation Command, and a multitude of other partners to plan for and execute the demonstration of several aeromedical technologies of interest to Army leadership. Included within this effort was the use of a novel load stability system technology demonstration that displayed the art of the possible in dramatically increasing rescue hoist operational capabilities while simultaneously reducing risk to both crewmembers and patient. That demonstration was well received and the development of load stability technology continues to progress through iterative design informed by Army requirements, Soldier touchpoints and operational feedback.

During PC22, USAARL will test and demonstrate two technologies: Operator State Monitoring (OSM) and Environmental Sensors in Training (ESiT). OSM includes wearable, wireless technologies designed to collect the physiological status of aircrew, along with processors that translate physiological metrics to health and cognitive state. OSM technology will be integrated into PC22 with the intent to mature the wearable technology, demonstrate device connectivity and explore nominal physiological thresholds to support future development and integration with aircraft and network systems. ESiT features wearable sensors designed to measure, monitor and store exposures to potentially concussive events resulting from head impact or accelerative events. During PC22, ESiT devices will be deployed with participating Soldiers. USAARL data collectors will assess usability and determine logistical footprint requirements for sensor management, data transfer and storage and power in the development of next-generation sensors.

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# FACING ANY ENVIRONMENT HEAD-ON

In this world, there are people who live the strenuous life—long, hard days outside in punishing conditions—and there are companies that make their gear. From the battlefield to the backcountry, from the edge of a raging wildfire to the top of a 15,000-foot peak, MYSTERY RANCH supplies these stalwart souls with backpacks to match their boldness.

By Mike England, Editor, Bozeman, MT



Two Soldiers sporting MYSTERY RANCH Backpacks; lightweight, durable, and flexible for meeting mission demands. MYSTERY RANCH - Got Your Six (MYSTERY RANCH)

Conceived in the Rocky Mountains and used all over the world, MYSTERY RANCH packs have always had a single purpose: to minimize the burden on your back. This maximizes your strength, speed, and overall performance—as a soldier, firefighter, hunter, skier, climber, or whatever bold and strenuous activity you call your own.

This much we know: how you spend your time is who you are. At MYSTERY RANCH, we spend our time making the best load-hauling backpacks in the world—and using them ourselves daily. Sewers set out at lunch for a quick lap at the local trailhead while designers gather to plan the next day's dawn patrol. Our enticement is alpine air and adrenaline; our reward...flushed faces and lactic acid in the legs. Weekends are spent in the mountains; we return to work with broad smiles, stories to share, and worn-out dogs that snooze at our feet. We embrace the strenuous life, and outdoor adventure is our passion.

With great passion comes great power—which in our case means the power to improve backpack design. And that's precisely what we've been doing since 2000, when MYSTERY RANCH was born in the burgeoning outdoor oasis of Bozeman, Montana. Founders Dana Gleason and Renée Sippel-Baker brought decades of industry experience to bear, furthering their longtime goal of making backpacks better, stronger, more flexible and durable—and, above all, more comfortable to carry when loaded.

## A ROBUST EVOLUTION

Built on the bedrock of Dana Design and other renowned outdoor brands, MYSTERY RANCH has since become a bastion of load-bearing R&D. From the first Navy SEALs who placed a custom order to the thousands of elite soldiers who now rely on us to keep their loads as

secure, stable, and pain-free as possible, it's always been about doing the best for the best. Because as far as we're concerned, nothing else is worth doing.

Moreover, nothing else so strongly drives our central imperative: the pursuit of perfection. The best fabrics. The best frames. The best technology. The best people and the best ideas. We listen to our customer's problems and then do everything we can to solve them. We do this with a potent admixture of collaboration, creativity, and audacity. Not to mention hard work—and lots of it. We make backpacks, after all, and we make them for the long haul.

As the old saying goes, quality is never an accident—it is always the result of intelligent effort. With a synergistic blend of pack-building prowess and exacting customer demands, we produce simple, practical designs that are inherently purposeful: tools, not toys. Another unassailable adage: form follows function. Our packs have a job to do, and we make damn sure they'll do it right—all day, every day.

## DUTY-DRIVEN PURPOSE

At MYSTERY RANCH, our mission is to support your mission—whatever that may be. Our customers are the rough and rugged ones of this Earth, those ambitious men and women with a lust for adventure and an affinity for struggle—be it occupation or recreation, perilous profession or ardent pastime, daily task, or weekend escape. They're discriminating people in demanding conditions; they must haul more and hurt less; they cannot—and will not—fail. And, if we have anything to say about it, neither will their gear.

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# EXTENDING PROTECTIVE REACH ACROSS THE SEA

The Defense Logistics Agency has been partnering with federal agencies to provide COVID-19 viral mitigation support to island nations.

By John Dwyer III and Nancy Benecki, Defense Logistics Agency



The Defense Logistics Agency Troop Support provided \$814,000 in testing and treatment equipment to island hospitals such as the LBJ Tropical Medical Center in the Solomon Islands and American Samoa. Items included COVID-19 test kits and oxygen concentrators. (DLA Graphic/Paul Crank)

In continued support of U.S. and international partners' fight against COVID-19, the Defense Logistics Agency (DLA) provided \$814,000 in testing and treatment equipment in May 2022 to the Solomon Islands and American Samoa.

Representatives from DLA Troop Support's medical supply chain worked with the U.S. Indo-Pacific Command (Indo-PACOM) and Department of Health and Human Services in the acquisition and delivery of more than 39,000 at-home tests and 10 oxygen concentrators.

"This is going to help these remote hospitals so much, and it couldn't happen without our amazing partners at DLA Distribution, the respective government partners and our DLA liaisons," Medical Collective Customer Operations Division Chief Yvonne Poplawski said.

The test kits, requested by Indo-PACOM and funded through Overseas Humanitarian, Disaster Assistance, and Civic Aid, will help identify positive cases at remote hospitals in the Solomon Islands.

## ACCESS AND INFRASTRUCTURE HURDLES OVERCOME

The orders came from customers without access to DLA's eCommerce platforms and required coordination with U.S. Transportation Command, DLA Distribution and liaisons such as Air Force Lt. Col. Lisa Wnek at Indo-PACOM to get items where they needed to go," Poplawski said.

"Limited infrastructure also made shipping a challenge. Twenty pallets of tests had to be broken down into 170 smaller packages for shipment to remote islands," Poplawski noted. Arranging the shipments involved daily conversations with Wnek in Hawaii.

The oxygen concentrators were delivered to the American Samoa islands on behalf of the U.S. Department of Health and Human Services (HHS) Office of the Assistant Secretary for Preparedness and Response.

"American Samoa had nearly no COVID-19 cases until earlier this year," said Dorothy O'Connell, chief of DLA Troop Support's Whole of Government Division. A spike in cases in Mid-March, however, overran some hospitals.

HHS turned to DLA for support of the remote location, and O'Connell's team jumped to action to fulfill the urgent need.

"The 'flash-to-bang' to procure [new concentrators] would've been too long, but we had oxygen concentrators ... that were already in San Joaquin that would work," O'Connell said. "So, I had [DLA Distribution] take pictures, open the boxes and verify the equipment condition."

"After forwarding the info to HHS to make sure they were acceptable, an immediate call was made to HHS' Emergency Operations Center to validate the shipping address and other details, and the items were airborne," O'Connell said.

"The relationships between DLA Troop Support, DLA Distribution, HHS and industry partners were not only key in this mission, but valuable connections in planning for future assistance and cooperation," O'Connell added.



# LIFE-SAVING THROUGH INNOVATIVE SEARCH AND RESCUE

Currently, Ukraine is employing one Vita Rescue System, a helicopter-compatible rescue litter system produced by Vita Inclinata (Vita), a supplier of mobile rescue equipment, actively deployed on the eastern front. Following the deployment, Vita received a formal request from the State Emergency Service of Ukraine for 30 more systems within 48 hours of completing the mission. Vita is actively working with Congress to deploy more of this life-saving capability to the front in Ukraine.

By Caleb Carr, President & CEO, Vita Inclinata



The Vita Rescue System (VRS) enables helicopter crews greater speed, safety, and control on hoisting operations, allowing them to complete hoists four times faster than traditional taglines. (Vita Inclinata)

In late March of this year, a mate of mine reached out to me about the Vita Rescue System (VRS). He emailed me, "I was scrolling LinkedIn, and I saw the VRS right next to a bombing of Kyiv. Can you help?" I found out later that the head of Ukraine's emergency service was right next to my friend when he realized the impact that the VRS could have on the country's fight.

There wasn't a question in my mind about what we should do once I spoke with the Ukrainian military directly. First, we had to use a hotspot on Google Hangouts because they had lost all connectivity via normal means. Then, through the spotty connection with them in a bomb shelter, the Ukrainian ministry explained the importance of the system and the impact it could have. It was all I could do not to be distracted by their bravery and the unmistakable face of exhaustion on all of their faces. Within ten minutes, my co-founder Derek Sikora and I decided to divert all of our resources to ensure that we could deliver the VRS to Ukraine as fast as possible. Within three weeks, we were successful.

Once we got to the country, we learned that the Ukrainians had grounded a good bulk of their helicopters because of the lack of a mission set - we at Vita Inclinata were determined to change that. We knew that deploying the VRS could enable these crews and operators to get into the fight.

## ENABLING AN EVOLUTION IN RESCUE

The emergency services of Ukraine had never had the ability to perform medical evacuations with helicopters. So we showed up and had to train their personnel to use their hoist, deploy a rescue basket, and extract people out of the field. Although the Mi-8 helicopter had hoists, no one thought they could use those helicopters for medical evacuation (MEDEVAC) services.

By using the VRS, we were able to cut the training from a standard two weeks to less than three hours. Moreover, with the ability to have a stable rescue basket, the Ukrainians could now complete MEDEVACs without having to train the ground crew - enabling civilians to work directly with these helicopter crews. To put it simply, the Ukrainians were able to evacuate casualties and civilians with existing assets rather than spending weeks and money training people on how to do it. Examples like this prove innovation can change how wars are fought and how lives can be saved.

Now Ukrainian emergency services can go into the front and leverage a helicopter to quickly evacuate wounded from the front line and bring them to hospitals in Kyiv and Lviv. In addition, the VRS enables rapid rescue-basket extraction by eliminating the need for a ground-based stabilization of the rope - this changes the entire rescue dynamic.

# **ZANFEL POISON IVY, OAK & SUMAC WASH**

Zanfel Laboratories, Inc. is dedicated to producing high quality consumer products that address the issues associated with Poison Ivy, Oak and Sumac. Zanfel Poison Ivy Wash is a safer, faster and more effective option than steroids or antihistamines for relieving poison ivy, oak or sumac. Use of Zanfel gets warfighters back to duty in an itch-free, healing state.

By Steve Sisler, Vice President of Sales, Zanfel Laboratories, Inc.

## **WHAT IS ZANFEL**

Zanfel® Poison Ivy Wash is the only product clinically shown to remove urushiol, the toxin found in poison ivy, oak, and sumac, ANYTIME after outbreak of the rash. With a small amount of water, you can treat yourself in the field. Unlike Zanfel, other products temporarily reduce itching but do nothing to remove urushiol. Once the urushiol has been removed, the body is in a position to immediately heal the rash.

- Zanfel relieves itching within 30 seconds.
- One and done treatment for poison ivy.
- Completely removes poison ivy oil from the skin.
- Healing starts after a 3-minute Zanfel wash.

## **WORKS ON INSECT BITES AND STINGS**

In addition to being used as a treatment for poison ivy, oak and sumac, Zanfel is also extremely effective for the pain and itch associated with Mosquito and Chigger Bites, Sand Flea and Sand Fly Bites, Bee, Wasp and Hornet Stings, Fire Ant and Black Ant Bites and other Insect Bites and Stings



"We want our troops back fast! Ready to work! Ready to fight! With Zanfel they're back in 2 minutes; not 2 weeks." Major General William Duffy (Ret.), Former Commander Special Forces Detachment

## **ZANFEL BENEFITS AND SAVINGS TO THE MEDICAL COMMAND AND THE WARFIGHTER**

- The use of Zanfel improves readiness and allows the poison ivy, oak or sumac affected warfighter to Return To Duty (RTD) within a matter of minutes, versus a week or more, in an itch-free and healing state.
- Improved training success, as a result of reduced student recycle rates.
- Significant and immediate cost savings to the unit and medical command.
- Reduced cost to the force and dependents globally for DoD.



Got Poison Ivy? Get Zanfel. It Works!

## **PLANTS AROUND THE WORLD, WHICH ALSO CONTAIN THE POISON IVY TOXIN (URUSHIOL)**

Risk of exposure to urushiol (the poison ivy toxin), is not only a North American allergic skin reaction. Below is a list of plants around the world that contain urushiol. Keep Zanfel on-hand during deployments to these areas.

- Asian Poison Ivy (*Toxicodendron orientale*) – East Asia
- Brazilian Pepper Plant (*Schinus terebinthifolius*) – Southern US, South America, Caribbean, India, Australia, Pacific Islands
- Cashew Nut Tree (*Anacardium occidentale*) – Worldwide
- Chinese Varnish Tree (*Toxicodendron potaninii*) - China
- Lacquer Tree (*Toxicodendron vernicifluum*) – China, Japan, Korea
- Mango Plant (*Mangifera indica*)– Worldwide in frost free climates including California, Florida, Hawaii, and Puerto Rico
- Manzanilla (*Toxicodendron striatum*) – South America
- Pistachio Tree (*Pistacia vera*) – Iraq, Iran, Syria, Lebanon, Turkey, Greece, Tunisia, Kyrgyzstan, Tajikistan, Turkmenistan, India, Pakistan, Egypt, Sicily, Uzbekistan, Afghanistan (especially the provinces of Samangan and Badghis)
- Poisonwood Plant (*Metopium toxiferum*)– Southern Florida, Caribbean, Central & South America
- Small Flowered Poison Sumac (*Toxicodendron parviflorum*) – Bhutan, India
- Wax Tree (*Toxicodendron succedaneum*) – China, India, Nepal, Australia, New Zealand



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- Other Insect Bites and Stings

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Net Wt. 1/8 oz (3.6g)

(actual size)

### Packet 1/8oz = Single dose

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- NSN #6505-01-674-8237 (Case of 100)  
Item #689901200001
- NSN #6505-01-674-8248 (Case of 500)  
Item #689901205006

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Get Troops Back in  
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### Tube 1oz = 15 doses

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For more information e-mail us at [itchfree@zanfel.com](mailto:itchfree@zanfel.com),  
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**SEP 7 – 8**

**AI For Defense**  
Washington, DC  
[Ai.dsigroup.com](http://Ai.dsigroup.com)

**SEP 12 – 15**

**MHSRS**  
Kissimmee, FL  
[Mhsrs.net](http://Mhsrs.net)

**SEP 21 – 22**

**Military Tactical Communications**  
Ft. Bragg, NC  
[Tacticalcommunications.dsigroup.org](http://Tacticalcommunications.dsigroup.org)

**SEP 27 – 29**

**Pacific Defense Contracting Summit**  
Honolulu, HI  
[Usdlf.org](http://Usdlf.org)

**OCT 10 – 14**

**EMS World Expo**  
Orlando, FL  
[Emsworldexpo.com](http://Emsworldexpo.com)

**OCT 10 – 12**

**AUSA Annual Meeting**  
Washington, DC  
[Meetings.ausa.org](http://Meetings.ausa.org)

**OCT 12 – 13**

**DoD/VA & Gov Health IT**  
Oxon Hill, MD  
[lehrsummit.dsigroup.org](http://lehrsummit.dsigroup.org)

**OCT 19 – 20**

**Counter Insider Threat Symposium**  
Oxon Hill, MD  
[Insiderthreat.dsigroup.org](http://Insiderthreat.dsigroup.org)

**OCT 20 – 22**

**HOTZONE**  
Houston, TX  
[Hotzone.mobi](http://Hotzone.mobi)

**NOV 7 – 10**

**Modern Warfare Week**  
Fort Bragg, NC  
[Gsfsymposium.org](http://Gsfsymposium.org)

**JAN 10 – 12, 2023**

**Navy National Symposium**  
Crystal City, VA  
[Navysnaevents.org](http://Navysnaevents.org)

**JAN 17 – 20**





**SHOT Show**  
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- > Air Force Safe-to-Fly Certification
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- > DLA DAPA Agreement: SP0200-03-H-0008
- > DLA VIPA Agreement: VMP-1412-03
- > FSS Contract 6511a/GSA Schedule-V797D-30127

NSN 6515-01-626-8691  
Masimo PN 3639

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- > Air Force Safe-to-Fly Certification
- > ECAT PMCE Contract: SPE2D1-21-D-0010
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- > FSS Contract 6511a/GSA Schedule-V797D-30127

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