

# COMBAT & CASUALTY CARE

Q3 2024  
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**OPTIMIZING LONG-TERM  
POST-TRAUMA HEALTH**

## COMMANDER'S CORNER



**MG Paula Lodi**  
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U.S. Army Medical Research and  
Development Command  
Ft. Detrick, MD



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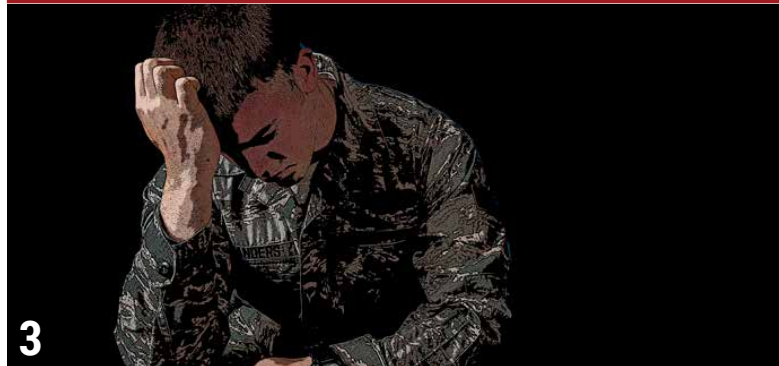


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## ANSWERING THE COMBAT STRESS CALL

The U.S. Army and Department of Defense has instituted a six-step protocol called iCOVER to increase acute stress reaction in combat survivors by enabling them to help their fellow warfighters rediscover decision-making parts of the brain lost to the fog of war.

By Paul Lagasse

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### COMMANDER'S CORNER

#### MG Paula Lodi

Commanding General  
U.S. Army Medical Research and  
Development Command  
Ft. Detrick, MD

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#### LTG Telita Crosland

Director  
Defense Health Agency  
Falls Church, VA

**Cover:** A paratrooper from the 173rd Airborne Brigade is treated by a combat medic during live fire training lanes at Grafenwohr, Germany. (U.S. Army photo)

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By Mark Darrah

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# COMBAT & CASUALTY CARE

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## INSIGHTS

With much of what makes a combat casualty visual to the eye, it is often the invisible wound that leaves the deepest scar. The Q3 2024 edition of *Combat & Casualty Care* sheds some light on affects that physical trauma can have on the warfighter psyche long after the body has recovered. From traumatic brain injury (TBI) to combat-related experiences that lead to acute stress reaction or ASR, what defines a casualty of war today is as much about any wounds to the body as those unseen, potentially increasing, wounds to the mind.

As research into just how TBI debilitates human motor function and the process of thought formulation has evolved, the science of how blast overpressure (BOP) waves can traumatize and permanently damage the brain has depended as much on lessons learned from patient accounts of changes to sensory perception to analysis of actual changes to physical tissue. The Warfighter Brain Health Initiative (WBHI), overseen by the Defense Health Agency (DHA) and WBHI Policy Director Kathy Lee, is the latest example of Department of Defense efforts to understand how repetitive exposure to BOP can lead to cognition loss and long-term diminishment of motor function. With advanced research based on real world experience, proactive solutions in achieving positive outcomes for those experiencing a TBI become more possible every day.

In as much as TBI can affect cognitive processes, so also can TBI-related trauma create acute stress reaction (ASR) in those experiencing it. The U.S. Army Medical Research and Development Command (USAMRDC), Ft. Detrick, MD, led by MG Paula Lodi, USAMRDC's newly-installed Commanding General, is leading efforts through the Walter Reed Army Institute of Research (WRAIR) to implement an Israel Defense Force-developed technique involving a six-step protocol that Warfighters can use to assist a battle buddy experiencing an ASR by helping them bring decision-making parts of their brain back into play. Called iCOVER, the U.S. Department of Defense has adopted this communicative form of tactical stress care in hopes of affecting positive change for servicemembers at risk.

Recent command restructuring has seen USAMRDC move under the purview of DHA responsibility. With this new day dawning, it made extra sense for this edition of C&CC to include word from the DHA Director herself, LTG Telita Crosland, who provides us with a look at some current top agency priorities. From modernizing the Military Health System (MHS) to building greater resiliency into integrated MHS delivery, DHA will now work even closer with MRDC to ensure America's Servicemembers and their families get the best medicine wherever they are. And from wherever patients are on the globe is the driver of next-generation telerobotics in the execution of life-saving, remotely-conducted, telemedicine-enabled surgical intervention. Don't miss an informative follow up to an intriguing panel discussion we first presented readers in the Winter 2023 edition.

As always, feel free to send us your comments and suggestions. Thank you for your continued readership!

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# ANSWERING THE COMBAT STRESS CALL

Developed by the Israeli Defense Force to address acute stress reaction (ASR) in soldiers, iCOVER is a six-step protocol that warfighters can use to assist battle buddies experiencing an ASR by helping them bring decision-making parts of their brain back into play.

by Paul Lagasse, USAMRDC



Servicemembers can experience post-traumatic stress disorder (PTSD) even when they have not been in a combat situation. Complex PTSD involves exposure to a trauma that is either repeated exposure or a trauma perpetrated against an individual by someone who is in a trusting or caregiving position. (U.S. Air Force illustration by Alex Pena)

Against a backdrop of small-arms fire punctuated by an occasional distant explosion, a squad of Soldiers enters a contested building and ascends swiftly up a darkened stairwell. The team splits up, with three Soldiers entering an empty room to clear it. Suddenly, one of the Soldiers is knocked down by the impact of a sniper's bullet through a window. His closest squad mate drags him out of the line of fire, calling urgently for a medic. He then yells to the private at his left to return fire – but the private is frozen, sitting on the floor staring wide-eyed at the wounded Soldier, seemingly oblivious to the chaos erupting around him. Although the room is being peppered with bullets and flying chunks of plaster, the private remains immobile, completely overwhelmed and unresponsive to his buddies' predicament. If you were in the room with them, what would you do?

This scenario is presented to Warfighters as part of a training program developed by researchers at the U.S. Army Medical Research and Development Command's Walter Reed Army Institute of Research to teach them what to do if they ever encounter such a situation in real

life. The condition being experienced by the private in the hypothetical firefight is called an acute stress reaction, or ASR. It occurs when the levels of physiological and psychological stress exceed a person's ability to respond effectively to a threat or the environment. They become overwhelmed, disoriented and unable to act to protect themselves or others from harm. Warfighters have nicknamed this reaction as "going into the black." In a combat situation, going into the black can cost lives.

Using neuroscience as a foundation, researchers believe that an ASR occurs when the part of the brain that controls emotion, called the amygdala, overrides the logical, decision-making parts of the brain, causing the person to experience a paralyzing, overwhelming fear. Researchers have nicknamed this reaction an "amygdala hijack."

"ASR is a normal, natural reaction to extreme stress, but it has real-world implications for the military," explains Dr. Amy Adler, a clinical research psychologist and the senior scientist at WRAIR's Center for Military Psychiatry and Neuroscience. "If someone isn't able to function during a critical moment like a firefight, not only are they putting themselves in danger, they're also potentially endangering their team and the mission."

A survey conducted by Adler and her colleagues at WRAIR found that between 17% to 23% of Warfighters who have been in combat report having experienced a possible ASR, and upwards of 40% to 50% of veterans have witnessed at least one possible ASR in their unit during combat. Moreover, while in many instances the mental freezing lasted only a few seconds, over half of the respondents of Adler's survey said it took them more than five minutes to recover fully.

"We realized this represented a gap in our knowledge," says Adler, referring to the prevalence and duration of ASR events in combat situations. "The field of psychology has not done much research into ASRs. There are a lot of questions that we don't know the answers to. From the perspective of psychology, we saw an opportunity to step in and develop a systematic intervention."

## ENTER iCOVER

While attending the biennial Shores Conference on Military Medicine convened by MRDC and the Israel Defense Forces several years ago, Adler learned about a peer-based ASR intervention launched in 2014 by the IDF called YaHaLOM. The YaHaLOM technique (the name is an acronym for the Hebrew words representing the technique's five steps) can be taught to Warfighters in an hour, and it was so successful that training in the technique is now mandatory in the IDF's ground forces.

Adler and her team expanded on the YaHaLOM concept to develop what they call iCOVER, a six-step protocol that Warfighters can use to assist a battle buddy who is experiencing an ASR by helping them bring the decision-making parts of their brain back into play. The acronym reflects the first letter in each of the technique's steps:



Dr. Amy Adler

- i = Identify** the team member who is having an acute stress reaction
- C = Connect** through eye contact, touch or hearing to bring them to the present moment
- O = Offer** commitment to reduce sense of isolation
- V = Verify** facts with simple questions to get the thinking brain back in gear
- E = Establish** order of events to reorient the individual
- R = Request** action to re-engage in purposeful action

iCOVER is easy to learn and to use; the basics can be imparted in a 45-minute training session and a person can perform the six steps in under a minute as part of tactical stress care. iCOVER relies on physical touch, eye contact and clear, firm directions to help the person experiencing an ASR recover and become functional again. Today, iCOVER is incorporated into the Army's training programs including deployment cycle support. A short video explaining the iCOVER technique is available on YouTube.

In addition to helping improve a unit's combat effectiveness, iCOVER gets Warfighters used to the idea that ASR is a normal response to an abnormal situation, which helps reduce the stigma associated with freezing under fire.

"The intervention itself is powerful, but the knowledge that comes with the training is helping Soldiers realize that experiencing an ASR is not a failure of character or something they should have been able to get over," says Dr. Emily Lowery-Gionta, a research psychologist and section chief of WRAIR's

Performance Assessment and Chemical Evaluation Lab. "The training materials Dr. Adler and her team developed communicate this clearly to make sure that people understand this up front."

## TESTING ICOVER IN HOSPITAL EMERGENCY DEPARTMENTS

Lowery-Gionta will be speaking at the 2024 Military Health System Research Symposium on a collaborative study being undertaken by her lab in partnership with the University of North Carolina at Chapel Hill and Cooper Medical School of Rowan University in Camden, New Jersey. The study will assess iCOVER's effectiveness in helping patients in hospital emergency departments to recover from ASRs.

The three-year study will take advantage of a research network established by Dr. Samuel McLean of the UNC School of Medicine's Institute for Trauma Recovery for the AURORA study, a groundbreaking study of the effects of traumatic stress exposure on brain biology, daily function and post-traumatic stress symptoms. Because it is not possible to safely conduct a clinical study of iCOVER's efficacy in a combat environment, Lowery-Gionta and Adler worked with Dr. McLean to design a study that will be conducted with acutely traumatized patients seeking care in emergency departments as a way to evaluate iCOVER in action.

"We already know that iCOVER is successful because those who are trained in it feel empowered to handle an ASR experienced by a battle buddy and also because it's been enthusiastically embraced by militaries around the world," says Lowery-Gionta. "The driving questions for this new study are: Can we quantify the efficacy of iCOVER for individuals who receive the intervention, and can we use iCOVER effectively in a civilian population?"

The research team's protocol has been approved by the university's Institutional Review Board and the participating institutions are in the final steps of training study staff in the iCOVER protocol. Recruitment of the first round of study participants is expected to begin later this year. Lowery-Gionta expects that the outcomes will be useful for informing military applications of iCOVER as well.

The presentation on the joint MRDC/UNC/Cooper Medical School study will not be the only discussion of iCOVER at this year's MHSRS. Capt. George Mesias, a social work researcher with WRAIR's Military Psychiatry Branch, will be presenting on lessons learned from a training course on operational resilience developed by WRAIR and researchers in Norway. The course, which includes training in iCOVER, is being offered to Ukrainian servicemembers to help them address combat stress.

Lowery-Gionta is hopeful that the outcomes of the clinical study will help researchers better understand the causes of ASR and lead to new ways of treating it.

"Acute stress reaction is an easily identifiable phenomenon, but it hasn't received much attention in the scientific literature," says Lowery-Gionta. "I think that's in part because it's difficult to study in real time and also because there's a feeling that it's just something that happens and there's nothing we can do about it. Part of what Dr. Adler and I are trying to do is bring attention to the fact that while we haven't yet found how to prevent the onset of ASR, we know we can intervene, and I think that starts with iCOVER."

"I think it's a really exciting time to be engaged in this kind of research," adds Lowery-Gionta. "We're all very passionate about it and we're trying to get other people to jump in the deep end of the pool with us to help accelerate the development of solutions for servicemembers."



Dr. Emily Lowery-Gionta

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# NEXT-LEVEL COMMITMENT TO ACHIEVING NEXT-GENERATION SURGICAL AUTOMATION

Combat & Casualty Care is proud to offer readers a follow-on feature to one which ran in the Winter 2023 edition entitled **Telerobotic Surgery: Advancing Availability through Autonomy** (available online at <https://tacticaldefensemedia.com/wp-content/uploads/2023/12/cc-winter-2023.pdf#toolbar=0>). This latest feature includes a panel of distinguished military medical professionals who participated in the second of two symposiums focused on proven telemedicine science as a foundation for the physical application of globally-executable telerobotic surgery. This second symposium, entitled **TeleRobotic Surgery Symposium Part II: Establishing Surgical Telementoring Foundation**, and hosted by the U.S. Army's Telemedicine & Advanced Technology Research Center (TATRC) Medical Robotics and Autonomous Systems Division, relayed lessons learned and identified capability gaps in creating an updated collective roadmap from foundational surgical telementoring for a methodical step-wise introduction to telerobotic surgery through the leveraging of remote surgical expertise.

surgery trajectory, with a goal of delivering surgical and invasive medical treatment, not just in brick-and-mortar facilities, but austere environments. The vision is to establish surgical telementoring, starting in hospitals, developing techniques, and expanding capability in Combat Readiness and Training for the improvement of patient care. Robotic surgery is using computer-assisted devices to enable the surgeon to raise and extend level of expertise. The remote aspect to telementoring allows surgeons to use audio and video communication, and share know-how using information technology. Whereas telepresence brings in virtual reality, an ongoing evolution of virtual reality in telementoring surgical care encompasses 'hands-on' remote assistance with robotic surgery. Surgeons are removed geographically while manipulating a device from afar to perform surgery in real time. The robotic surgery platform allows that to happen with procedures, like suturing bowel and vascular anastomosis, which may involve semi-autonomous robotics, as well as autonomous. Ultimately, the long-term goal of fully autonomous telerobotic surgery is in pursuit.

## PANEL DISCUSSION PARTICIPANTS



**Dr. Gordon Wisbach**  
(CAPT, USN, Retired)  
Telesurgical Director, Virtual  
Medical Operations Center, Navy  
Medical Center, San Diego



**COL Jeremy Pamplin**  
Director  
Telemedicine & Advanced  
Technology Research Center



**Mr. Nathan Fisher**  
Division Chief, TATRC Medical,  
Robotics and Autonomous Systems



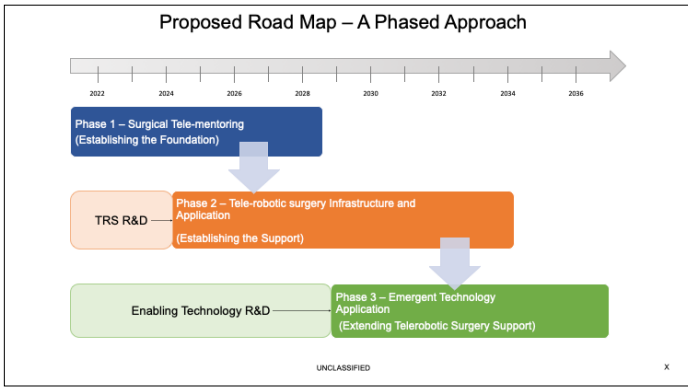
**CAPT Miguel Cubano**  
Fifth Fleet Surgeon, U.S. Naval  
Forces Central Command

**C&CC: How has telementoring created a still-evolving pathway to tele-robotics?**

**Dr. Wisbach:** Telementoring is establishing the foundation for layering on more and more capability. This is certainly true within the telerobotic

**C&CC: Provide some background on the state of telemedicine and the evolution of tele-robotic surgery.**

**COL Pamplin:** The mission of U.S. Army Telemedicine & Advanced Technology Research Center (TATRC) is to fuse data humans and machines into solutions that optimize warfighters performance and casualty care. And a lot of what you are talking about today, the ability to connect robotics and machines to the human technology team is what allows us to really optimize the medical medical team's performance around a casualty to ensure that that cash DQ needs whatever procedures necessary, gets that procedure, wherever they may need it. Optimizing casualty care is our current operating context, but it is about extending the ability of a single human to do more using technology. Back in the 2000s, there was some work with the Defense Advanced Research Projects Agency (DARPA) and TATRC in applying surgical techniques to a trauma pod. A self-contained, fully autonomous system that allows you to include procedural support without a human presence was both the beginning and the end of the conversation about surgical robotics in a forward operating environment for almost a decade. That project ended in about 2007. It was not until the birth of the medical assist support technologies portfolio we call mast in the medical robotics and autonomous systems line of effort that brought forward the Tron project in 2019 which helped fuel growth in telesurgical robotics and partnerships in advanced medical technologies research. The value of connecting technology to caregivers in our garrison and operational spaces to understand how it can best be applied to the military mission. Long delayed or unavailable evacuation because of geographic distance causes problems with resource consumption resource availability to include that of experts. We cannot have a surgical expert every single location that we may find ourselves in the requirement to disperse our forces. So much weather keeps advancing, disperse our forces, really dilute again, resources, and delays our ability to supply the reality that our enemies will have the ability to reach us when we may not



Telerobotic Surgery Proposed Roadmap. (NMCS D)

want to be reached through deep fires, and space exploration space engagement really defines the need for us to remain very mobile.

**C&CC: How do you see the development of telemedicine helping to grow the infrastructure necessary to seeing its potential realized?**

**Mr. Fisher:** Fixed facility hospitals with better infrastructure are the model for operational and tactical areas that have more limited network infrastructure. Based on where you are on the spectrum of network resources, you may have one capability set with less than 300 millisecond latency on the order of megabits per second bandwidth, synchronous telementoring for video console reliance, the ability to rely on cloud computing, and the feasibility of direct teleoperation for robotic

assistance. Where you do not have those kind of network resources, you are forced to use mostly asynchronous telementoring. Advanced surgical telementoring tools can extend capability to theater support hospitals that have better network resources and infrastructure. And then we can build on infrastructure to support telerobotic surgery in that setting. Advanced tools are less reliant on the network and network improvements, and can be extended out to operational support areas to hospitals and other more mobile medical units. With telerobotic surgery, the charge is to continue pushing these augmenting tools out to support deployed surgical teams. First through telementoring and then across the robotic surgery spectrum, possible despite the network challenges perceived, the goal is to maximally support theater hospitals first with surgical telementoring and incrementally through computer robotic-assisted teleoperation or other automated technologies. And then what this allows us to do is free up our human capital in that scenario, and then push it farther forward to where it's needed on the battlefield, where they can operate easily and they're not as constrained by kind of the infrastructure and network challenges and then, as we develop ways to mitigate some of those network challenges and prove those tools, we can further extend those out to the operational support area, further freeing up our human resources to push them to the frontline where they're able to operate and provide the capability and capacity we need in that area. The current state of robotic surgery is ubiquitous enough in DoD medical arenas has increased the potential for an ecosystem where we can continue to push these technologies forward and run pilot studies. Reduced barriers for legal and licensing of telerobotic assisted procedures have more surgeons operating a robotic platform remotely, assisting in the success many procedures, particularly laparoscopic. Getting to the point where we can have telerobotic surgeons lead procedures earlier, increase the potential for more pilot studies within the medicines, and recognize that there's communities out there like Special Operations that could play a major role in the early adoption of this kind of technology is key. Opportunities to prepare for future multi-domain operations before they are reality within such events as humanitarian and disaster relief missions, will increase the likelihood of telesurgery being able to support rural hospitals. We have shared requirements and shared challenges with those missions that will help us prepare for the future of medical support across the multi-domain operations environment.

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**C&CC: Can you provide some background for readers regarding the evolution of telemedicine into the telementoring we see today and its criticality to telesurgery?**

**CAPT Cubano:** In 1994, there was still no dedicated telemedicine equipment on U.S. Navy ships, only simple off-the-shelf equipment, nothing high tech, with large monitors. In 1995, Johns Hopkins Applied Physics Lab began proving a concept of remote guidance in surgical medicine called telementoring. Remember, at this time, there was no Internet and certainly no wifi on Navy ships at sea. There was no way to do phone and images at the same time. We ended up using just a microphone, like a headset with a microphone, telephone lines to conduct telemedicine. A Navy award in 1994 to the Inmarsat company for \$60,000 worth of laparoscopic surgical equipment helped support the first telementoring experience, with off-the-shelf and whiteboard capability to prove the concept. By 1995, the first telementored gastric bypass program was begun in the military and I was involved in program-associated telemedicine-based worldwide consultation. One of the problems we found was that a lot of patients globally,



particularly in poorer countries without dedicated communications infrastructure, had complications that couldn't be seen until dedicated communications infrastructure became adequate enough by 2010 to support teleconsulting. This enabled us to address an overwhelming need for surgery in areas such as pediatric injury, thoracic injury, and cardiac intervention.

Since the mid-90s, we have gone from an average of 100 telemedicine consultations a month to 90,000 just last April and May. We cannot over-emphasize the importance that the audio and video of telementoring continues mean to remote surgical procedure, literally laying the framework for the semi-autonomous telesurgery of today and fully autonomous telesurgery of tomorrow.



Telemedicine Equipment onboard USS Abraham Lincoln CVN 72 in 1994. (U.S. Navy)

**C&CC: What is your outlook on the direction telemedical capability should take and are there any important milestones you see on the horizon?**

**Dr. Wisbach:** Telementoring, or technology in general, is only as good as the information provided as its foundation. Formalizing the surgical telementoring process and making it reliable so that you are sure you have a reliable, robust technology bolstered by clinical expertise is essential to moving the needle forward. To do this successfully, one must have both clinical and technology guidance working hand in hand.

Telesurgery technologies (procedural telementoring through minimally invasive and open telerobotic capabilities) have profound potential to extend operational reach and preserve combat power. A recent panel

of military and civilian leaders at the 2024 Society of Robotic Surgery (SRS) Annual Meeting discussed a vision to unite stakeholders of surgical telementoring (STM) and robotic telesurgery (RTS) as well as how to secure necessary Research & Development resources to make this impactful capability a reality in support of the military mission. STM/RTS has clear applications for austere surgery across military, space, maritime, disaster, and rural medical contexts. The panel concluded a developed and employed telesurgery capability will increase the availability and capacity of surgical resources when needed to care for combat casualties and that the U.S. military is uniquely positioned within the U.S. healthcare system to address many challenges facing RTS development.

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## OPTIMIZING CAPABILITIES ACCESS FROM POINT OF INJURY THROUGH RECOVERY

*Major General Paula Lodi assumed command of USAMRDC in July of 2024. She is a native of Franklin, Massachusetts and commissioned into the Medical Service Corps as a Distinguished Military Graduate of the Rutgers University ROTC program.*

*MG Lodi's first assignments were with Forward Support Battalions in the 3d Infantry Division, Schweinfurt, Germany, and 4th Infantry Division, Fort Cavazos, Texas, where she served in a variety of medical and multifunctional logistics positions including Ambulance Platoon Leader, Battalion S1 and S4, Support Ops Maintenance Officer, Brigade S4, and Company Commander. Over two tours at Fort Cavazos, she additionally served as Deputy Chief, Managed Care and Executive Officer at Darnall Army Medical Center; Plans Officer for III Corps; Executive Officer of 21st Combat Support Hospital; and Deputy Brigade Commander of 1st Medical Brigade. Other assignments include Operations Officer, 18th MEDCOM DCS-OPS in Seoul Korea; Chief, Military Personnel at William Beaumont Army Medical Center, Fort Bliss; Executive Officer to the Director of the Army Staff at the Pentagon and Chief, Leader Training Center at Medical Center of Excellence. Command assignments include the 15th Sustainment Brigade Special Troops Battalion, 14th Combat Support Hospital, 44th Medical Brigade, Regional Health Command – Atlantic and most recently 18th Theater Medical Command. Other assignments as a General Officer include Deputy Chief of Staff, Operations for the Office of the Surgeon General and U.S. Army Medical Command; and the Deputy Commanding General (Support) U.S. Army Medical Command.*



### MG Paula Lodi

Commanding General

U.S. Army Medical Research and Development Command  
Ft. Detrick, MD

and Chief of Healthcare Operations and Deputy Chief of Staff for Operations at the Office of the Surgeon General, allow me to understand how to connect strategic vision to tactical outcomes. The range of opportunities I've been given has allowed me to gain experience in just about every aspect of the Army medicine enterprise. The opportunity to lead and influence the full life cycle of medical innovation, from the innovative concept to mission employment by the Warfighter, is compelling. I believe my operational experience will help inform how MRDC approaches its mission.

**C&CC: What key initiatives will you be focusing on at the outset of your tenure at MRDC and why?**

My main priority is to ensure MRDC's integration with the Defense Health Agency matures seamlessly while minimizing both risk to mission and risk to workforce. Fundamental to that objective is ensuring everyone in the organization understands their role in the transition and that their talent and experience is both appreciated and maximized. While MRDC is well known for its unique medical materiel research and development capabilities, this is underpinned by its most valuable resource, its people. I am confident in the team's ability to apply its tremendous experience to support both the Army and DOD's requirements in a way that

*Combat & Casualty Care had the opportunity to speak with the Army's Medical Research and Development Command's new Commanding General, MG Paula Lodi, regarding areas of current and forward-looking focus across the command architecture, from modernization and transformation efforts to transition goals as part of the command's reset under Defense Health Agency oversight.*

**C&CC: You have been quoted as saying that your career path has been somewhat unconventional. Can you elaborate on that a little and explain how you plan to use your range of experience to inform your goals for leading MRDC?**

After graduating from the Rutgers University ROTC program, I served in a wide range of operational assignments that shaped my thinking about how to support the Warfighter, which became my passion. I have experience in Healthcare Plans and Operations and Multifunctional Logistics that, combined with institutional experiences such as my time as the Chief of the Leader Training Center, Medical Center of Excellence

compliments Army Futures Command and the Defense Health Agency's missions respectively.

**C&CC: Speaking of MRDC's DHA transition, how do you foresee this will benefit MRDC in carrying out its mission, and how will it benefit the Warfighters whom it serves?**

The DHA's mission is to support our nation by improving health and building readiness – in the agency's terms, by "making extraordinary experiences ordinary and exceptional outcomes routine." MRDC has always been focused on ensuring that medical capabilities are delivered to the Warfighter responsively and responsibly. MRDC will be able to draw on the wide range of resources, personnel and capabilities available to DHA to ensure that military medical research and development are postured to enhance DHA's role as a Combat Support Agency in support of the Warfighter.

**C&CC: Given your operational experience, can you speak about your vision for how military medical research and development integrates with the Army's plans for modernization and transformation? How do you envision MRDC identifying and filling high-risk capability gaps in military medicine S&T investment?**

Military medical research and development is an essential part of the continuum of care. My recent experience commanding a Theater Medical Command in the IndoPacific clearly demonstrated to me that innovation in the R&D space is the ONLY way we will deter the very real threats we face from a multitude of adversaries. MRDC's transition to DHA creates the conditions for a powerful effort that brings all of DOD resources and activities to bear on important capability gaps. For instance, the Army is looking at advanced technologies like sensors and drones to improve dominance on the battlefield; our medical devices, protocols and therapeutics must be ready to work with those new technologies and be protected from interference by the technologies of our adversaries and near-peer rivals. This involves not only the traditional work of research and development, but also the incorporation of lessons learned from experimentation in the operational environment to inform military medical innovation.

**C&CC: Lastly, what are some of the other aspects of military medical R&D that you are looking forward to focusing on at MRDC?**

I'm looking forward to getting to know and serving the people and missions of this incredibly diverse, worldwide command. MRDC's center of gravity is the scientists, program managers and support personnel who work tirelessly every day, dedicated to finding new and better ways of providing life-saving capability to our fighting force. I am laser focused on ensuring that maximum synergy and collaboration is realized in the transition to DHA and in support of the Army's priorities. Finally, I am excited to tell MRDC's story in a way where senior leaders understand the relevance and importance of MRDC's work – not only to assuring our allies and partners of our commitment to peace, but also to deterring our adversaries and countering the threat they pose.

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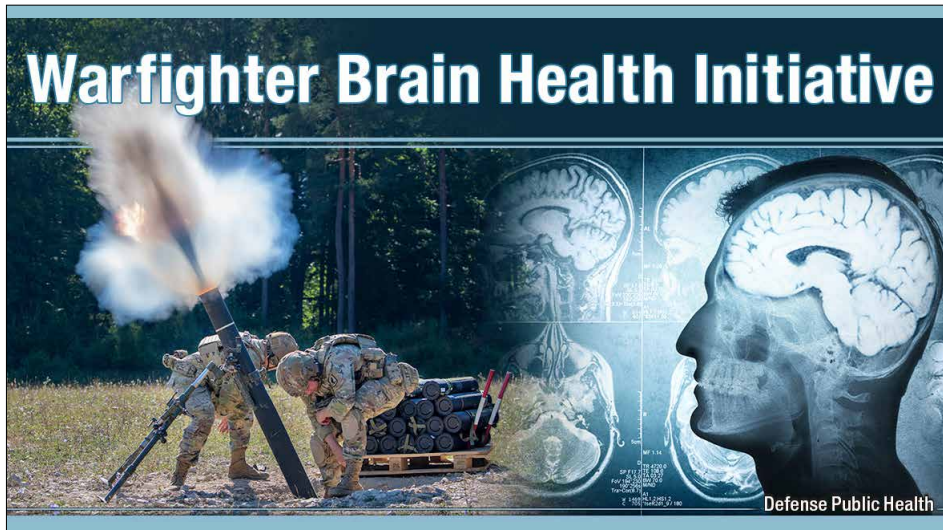
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# TAKING THE INITIATIVE ON BRAIN HEALTH

Since 2018, a joint Department of Defense effort entitled the Warfighter Brain Health Initiative, or WBHI, has been in motion to protect or improve cognitive and physical performance of America's military. The effort is a collaboration of operational and medical forces to achieve greater combined know how.

By Derik Crotts and Laura Villarreal, MHS Communications



The Department of Defense launched the Warfighter Brain Health Initiative (WBHI) to bring together the operational and medical communities in a more unified approach toward optimizing service member brain health and countering traumatic brain injuries. The WBHI specifically focuses on assessing cognitive capabilities, monitoring brain threats, to include blast overpressure, and minimizing the effects and risk from exposures and TBI injuries to improve a warfighter's overall performance. (Defense Centers for Public Health-Aberdeen graphic illustration by Joyce Kopatch)

The future of warfare requires servicemembers at peak performance both physically and mentally, able to adaptively handle cognitive demands required to operate effectively across a full range of military operations. Outlined in the 2018 Deputy Secretary of Defense Memo, "Comprehensive Strategy and Action Plan for Warfighter Brain Health," DoD's aim is to detect brain injury as soon as it happens, to map known harms, and forecast brain health threats. Risks to brain health may include repetitive head impacts, low level blast overpressure (BOP) generated from firing heavy weapon systems, or exposure to blast pressure waves from explosions experienced by servicemembers in certain military occupational specialties or anomalous health incidents.

The U.S. Department of Defense (DoD) is focusing on brain health to protect the well-being of servicemembers and maximize abilities in defense of the nation. DoD has historically defined brain health in terms of human performance optimization. The most familiar aspect of human performance has been physical performance of the servicemember in terms of agility, endurance, and strength. One underlying readiness driver in the DoD's Warfighter Brain Health Initiative (WBHI) are thinking skills, called cognition, which plays a key functional role in a Service member's overall performance capabilities. To successfully defend our nation, DoD's WBHI is working to optimize physical and cognitive performance that enhances and maintains force readiness.

Through the WBHI, DoD is discovering more about how to strengthen cognitive performance and physical skills in our Service members. With a unified approach to brain health that spans across

military health, weapons development, and the intelligence community, more knowledge will help DoD with competing, deterring, and winning in all operational environments.

The WBHI recognizes effects of traumatic brain injury (TBI) and BOP not just for servicemembers but also their families, line leaders, commanders, and their communities. DoD is focusing on injury prevention and mitigation, brain monitoring, documenting, and increasing brain health safety across the WBHI focal areas.

## RAISING BRAIN INJURY AWARENESS

DoD's commitment to force health protection and sustaining Warfighter readiness applies to understanding, preventing, mitigating, accurately diagnosing, and promptly treating brain injuries and effects in all forms.

One way to alleviate detrimental effects of TBI is through early detection. The WBHI focuses on raising awareness and providing better education about mild TBI, otherwise known as mTBI or concussion. Knowing the signs and symptoms can help with early detection, allowing for earlier treatment and supporting the best possible outcomes for servicemembers.

Warfighter brain health refers to the physical, psychological, and cognitive status that affects a Warfighter's capacity to function adaptively in any environment. Brain health influences readiness, operational capability, mission effectiveness, and attaining superior lethality against adversaries. As part of DoD's responsibility to America and the troops defending our nation, the Department is working to reduce risks of exposures to known and emerging brain threats, such as BOP, head impact, and directed energy.

## COGNITIVE MONITORING PROGRAM

Currently, the DoD conducts cognitive monitoring in the pre-deployment setting. These metrics help inform TBI assessment and treatment should it occur.

The monitoring policy recently changed its scope to the lifecycle of the servicemember, for regular and ongoing monitoring, to identify and address any cognitive changes as soon as they are known. Expansion to include the entire Force is ongoing through a phased implementation.

Documentation helps with interventions to maximize brain health. Collecting baseline cognitive data for new recruits at initial military training installations for basic training serves as an early reference



Kathy Lee

point to monitor a servicemember's cognition across their military career.

"On June 3rd, the DoD's cognitive monitoring program began cognitive baseline testing of cadets attending the Reserve Officers' Training Corps (ROTC) summer training program at Fort Knox, Kentucky. Over the summer, 6,400 cadets will take a cognitive baseline test, called the Automated Neuropsychological Assessment Metrics (ANAM)," said Kathy Lee, who leads DoD

Warfighter Brain Health Policy. "Fort Sill, Oklahoma began cognitive baselining all military trainees on June 28, and the remaining 13 initial entry military training sites will initiate cognitive assessment baselines of recruits and cadets over the next 6 months."

After initial screening, tests will occur a minimum of every five years. Subsequent follow up testing allows opportunities for cognitive enhancements or restoration, should it be necessary. As DoD ramps up greater implementation, education, training, and operational rotations, they will gain more data and other relevant information to promote Warfighter well-being. Measures of success will connect data, and once the expanded cognitive monitoring program is fully implemented, coverage will apply for active-duty servicemembers and members of the National Guard and Reserve components.

### BLAST OVERPRESSURE WAVES

Blast overpressure waves, or BOP, are the waves felt after firing a weapon or munition. When a BOP wave occurs, there can be some impacts that affect cognition, balance changes, and other brain health issues.

It's important to remember that blast exposure does not equal brain injury.

Low-level blast exposure is generated from firing heavy weapon systems or explosives in combat or training environments. Exposure to low-level blast does not typically result in a clinically diagnosable concussion or mTBI. Symptoms from low-level blast exposure usually resolve with time and can include concentration problems, difficulty hearing, headaches, memory problems, slowed thinking or reaction times, and decreased hand-eye coordination.

Ongoing, multi-year research is investigating linkages between specific BOP levels for both acute and chronic/low-level/repetitive blasts and brain health impacts. The results of this research will help inform the development of blast exposure thresholds, medical surveillance, additional risk management actions and exposure controls to protect brain health.

DoD continues to advance policy to minimize the effects of exposure to BOP.

"To distill down our blast overpressure work into three areas, basically we're going to monitor, document, and institute increased risk mitigations actions. We are working towards greater knowledge on exposure limits for improved safety measures that helps Warfighters avoid unnecessary blast exposures," Lee said.

### IMPLEMENTING RESEARCH INTO OPERATIONS

DoD is a recognized world leader in the treatment and research of brain-related injuries, and research sponsored by the DoD has helped improve the lives of individuals who have sustained brain injuries. Some



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areas of breakthrough include blood biomarkers to help identify more severe brain injuries and greater ability to monitor and mitigate BOP exposures.

As the DoD evaluates organizations and individuals for brain health and performance effects, research is helping form a better understanding of BOP exposures to a Service member's health and performance in military settings. For example, the United States Special Operations Command is leading the way with support activities that address brain health needs in all environments, to include publishing a comprehensive Brain Health policy, USSOCOM 40-6, September 11, 2023.

In response to the fiscal year 2018, National Defense Authorization Act, Section 734, "Longitudinal Medical Study on Blast Pressure Exposure of Members of the Armed Forces," also referred to as the Blast Overpressure Studies (BOS), the DoD launched a series of studies to assess the overall impacts and effects of BOP on brain health. The objectives were to evaluate whether the DoD could monitor, record, and analyze blast pressure exposure in training and garrison environments, as well as to evaluate the feasibility and advisability of putting this information into a DoD record for later retrieval by operational and medical personnel. In addition, the objective was to review the Department's current safety standards concerning heavy weapons and munitions and to implement mitigation strategies as appropriate.

Most studies are complete, and DoD learned it is possible to monitor, record, analyze blast pressure exposures, and document exposures. Additionally, the Department looked at brain health effects from various commonly used munitions and weapon systems.



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## BRAIN HEALTH SPECTRUM RESOURCES

Secretary of Defense guidance, DoD policies, a continuous refinement effort, and implementation of best practices by leaders at all levels will help protect the health and safety of personnel from excessive and unnecessary BOP exposures during training and on deployment.

"Investing in brain health means prioritizing early detection, continuous support, and innovative rehabilitation approaches. It's about creating an environment where seeking help is encouraged, and mental strength is recognized as a critical component of mission readiness," says Lee. "We will continue to implement robust brain health initiatives for our warfighters. Their cognitive and emotional well-being is just as important as their physical prowess in safeguarding our nation's security."

A Warfighter Brain Health Hub at [www.Health.mil/Brain](http://www.Health.mil/Brain) serves as a central location for current information on brain health, including risks, diagnosis, treatment, support resources, and research. This website is available to anyone interested in the topic, with specific information for servicemembers, families, and health care providers.

### Examples of topics online:

- Blast Injury 101
- Brain Injury Awareness with the 19th Sgt. Maj. of the Marine Corps
- National Intrepid Center of Excellence – Contributing to Force Readiness Through Research
- Servicemember Low-Level Blast Symptoms and Exposure Facts
- TBI Resources for Military Leadership
- Veteran's Affairs (VA) research on TBI
- DoD Blast Overpressure Reference and Information Guide

"We know there is still much to learn about the brain, and that not everyone responds in the same way to similar exposures or injuries," added Lee. "As we move forward, we seek to create accurate and reliable data sets to document identified injuries, evaluating contributing causes and thresholds for concern, and assessing response to treatment, to optimize care and enable use of that data to inform gap-research investments and treatments."

## SUPPORTING THE FRONT LINES

Leader and servicemember training is one of the most important aspects of risk management and a high priority for taking care of people. DoD organization leaders are required to train and educate any personnel potentially exposed to BOP hazards about possible adverse health and performance effects, with actions they can take to minimize exposures. Examples of how to avoid excessive BOP exposures include standing away from a blast source, using assigned personal protective equipment, and avoiding needless weapons firing once training is completed.

Servicemembers currently receive training and education about recognizing BOP symptoms, requirements to report any actual or perceived health issues to their command, and how to seek an evaluation from their medical provider if experiencing symptoms.

DoD is preparing a detailed implementation with the Military Departments intended to provide specific guidance to servicemembers and leaders to reduce BOP exposure risks. For more information on WBHI, visit [Health.mil/Brain](http://Health.mil/Brain).

## ADVANCING HEALTHCARE ARCHITECTURE IN SUPPORT OF A DYNAMIC FIGHTING FORCE

*LTG Telita Crosland is the Director of the Defense Health Agency, leading a joint, integrated Combat Support Agency that delivers agile and scalable combat support to the Joint Force; builds an integrated and modern healthcare delivery system, and inspires teams of professionals to drive military health's next evolution. She most recently served as the Army Deputy Surgeon General and Deputy Commanding General (Operations) of MEDCOM.*

*LTG Crosland entered the Army as a Medical Corps Officer in 1993. She is Board certified by the American Board of Family Medicine, a Fellow of the American Academy of Family Physicians, and a recipient of The Surgeon General's "A" proficiency designator.*

*LTG Crosland is a graduate of the U.S. Military Academy, the Uniformed Services University of Health Sciences, and the U.S. Army Command and General Staff College. In addition to her Doctor of Medicine, she also holds a Master of Public Health from the Uniformed Services University of Health Sciences and a Master of Science in National Resource Strategy from the Eisenhower School.*



### LTG Telita Crosland

Director  
Defense Health Agency  
Falls Church, VA

*Combat & Casualty Care had the opportunity to speak with LTG Telita Crosland, DHA Director, regarding current and ongoing priorities relating to recent agency role transition and efforts to maximize combat support to the Joint Force, modernize a resilient, integrated health delivery system, and bring fulfillment to the DoD medical mission.*

#### **C&CC: What are the DHA's main priorities?**

**LTG Crosland:** DHA has three primary priorities. The first is enabling combat support to the Joint Force. We must deliver agile and scalable combat support capabilities to the Combatant Commanders and Joint Force in competition, crisis, or conflict. We need to respond with urgency to the challenges they share with us, and we need to bring flexible solutions, to any place around the globe that our mission requires.

Our second priority is building a modernized, integrated, and resilient health delivery system. The status quo is unacceptable in this moment. Our adversaries are adapting and modernizing how they will fight. We need to adapt too. American medicine is adapting and modernizing. We need to adapt to meet the competition at home, too. We must have an even closer connection to those innovators who are producing seismic scientific and technological advancements. Our warfighters, our patients and our medical teams are relying on us.

That means we're going to adopt new models for delivering and adapt as we go. We'll use demonstration authorities to introduce new technologies or new processes – and ensure that we focus on better outcomes, easier access, value over volume, and increase our patients sense of ownership and partnership in their own care. We're beginning to roll out a comprehensive campaign – called "My Military Health" – that drives this point home and puts the patient at the center of their care. Not a slogan, but a real campaign with real change, and lives up to our credo – Anytime, anywhere. Always. That's what patients are looking for in their health system, and we need to deliver it. Patients have choices in where they get their healthcare and we want them to choose us.

★ Our third and final priority is to have dedicated and inspired teams of professionals driving military health's next evolution. We're looking to bring back joy in medicine – with fulfilling and revitalized workplaces. Listen, we have the most exciting and fulfilling medical mission of any health system, anywhere. That's not me simply asserting that. It's what I hear from our people everywhere I travel. Our people are working hard, often with fewer resources than they had a few years ago. We're looking to change that, and add some new tools for our people as we go.



U.S. Airmen participate in a final field exercise at Travis Air Force Base, California, Nov. 22, 2022. Mobility Airmen in various operational positions completed a new nine-day Department of Defense/Defense Health Agency Tactical Combat Casualty Care Tier 3 Combat Medic Corpsman/Aerospace Medicine Technician training course. (U.S. Air Force photo by Heide Couch)

### **C&CC: How does the DHA support Combatant Commands and Military Departments?**

**LTG Crosland:** We're supporting Combatant Commands – and the Military Departments -- through the every day work of healthcare delivery, through focused capabilities that support deployed operations, and through strategic investments in future capabilities.

Let's walk through each of these for just a moment. We ensure a medically ready Total Force every single day of the year. It's at the center of our work – primary care, behavioral healthcare, preventive care. Collectively, it's how we ensure the force is ready to go anywhere on a moment's notice. That health delivery system also includes the care we arrange through the private sector and our TRICARE benefit. And family readiness is also part of readiness. Service members trust us to take care of their families, and both Combatant Commanders and the Services expect us to do this well.

We also have a set of specific activities within DHA that are focused on supporting operations in the deployed environment. It's a fairly comprehensive list, but includes our Joint Trauma System, the Armed Forces Blood Program, the Armed Forces Health Surveillance Center as well as other public health support, the Armed Forces Medical Examiner System. It also includes elements of DHA that support both peacetime health delivery and combat support – like Health Information Technology, Medical Logistics, Pharmacy Operations. Just about every element of DHA supports the operational mission of the Combatant Commanders and Services in some way.

We also never stop looking over the horizon. Our Medical Research and Development arm is responsible for ensuring we are tied to academia and private sector researchers to stay on the cutting edge. Breakthroughs in precision medicine, genomics, artificial intelligence, infectious disease prevention...you name it...need to be tracked and ready for rapid adaptation to military environments and military populations. Combatant Commanders in collaboration with the Services help us with identifying and prioritizing our research investments. "Knowledge management" is an important tool here – we need to understand what research is telling us, and then be able to translate and transmit that to highly mobile medical workforce stationed all over the globe.

### **C&CC: Could you discuss the role of the Joint Trauma System (JTS) within the DHA and its impact on combat casualty care?**

**LTG Crosland:** The Joint Trauma System (JTS) is an essential component of the DHA's supporting role in combat casualty care. The JTS is dedicated to the reduction of morbidity and mortality and the improved survivability for all trauma patients in both wartime and peacetime. This is a team that is committed to scientific discovery and medical advances. They are relentless and disciplined in collecting and analyzing data, and then continuously developing and updating clinical practice guidelines, and performance improvement initiatives.

One of the significant achievements of the JTS has been the establishment of the DoD Trauma Registry (DoDTR), which captures detailed information about combat injuries and treatments. There is no comparable existing registry with such a comprehensive collection of trauma injury data. This data is invaluable for advancing our support to military operations. I'm also proud of our continued expansion of partnerships with local communities, where we are now part of the trauma network, serving both military beneficiaries and other Americans when we may be the closest trauma center for an injured person.

I realize that most of the readers of this magazine are aware of the history behind the establishment of the JTS. It's worth an article unto itself. The JTS was borne out of the early stages of the wars in Afghanistan and Iraq; initially driven by an informal group of deployed and US-based surgeons who were learning and sharing together. Over time, the process became more formalized, but this collaboration – across the Services – is what helped lead to the highest survival rates from battlefield injuries ever experienced in warfare. The JTS continues to represent a very special, tight-knit community that isn't just informing the MHS, it's informing trauma care throughout the US and the world. The JTS is a model for how to do real, and rapid, clinical process improvement under the most extreme circumstances imaginable.

### **C&CC: With the recent restructuring involving Army Medical Research and Development Command moving under DHA oversight, have there been any changes in the focus and/or prioritization for that organization?**

**LTG Crosland:** So, the Army Medical Research and Development Command (USAMRDC) was recently aligned under DHA oversight.

The primary focus of the DoD medical R&D investment has always been to deliver products rapidly to the Combatant Commands and Services to ensure continued readiness of our Service members. MRDC remains committed to addressing the operational needs of our Warfighters. And I don't set the research priorities for MRDC from Falls Church, we collectively develop these requirements based on what our customers need. For the Combat Casualty Care research portfolio, research will remain focused on tactical combat casualty care, resuscitative strategies, forward surgical care, and enroute care. None of that is changing.

What we are doing is providing a new, enterprise oversight to their mission sets. I went up to Ft Detrick and spoke to the workforce about this transition in the Spring, and I reminded them that they are highly accomplished professionals who know their responsibilities and know how to do their jobs -- whether it's product development, fielding and equipping new capabilities, working with interagency partners like the FDA or the CDC. MRDC is a jewel of an organization today, and my goal is to ensure they have the resources and support to do their jobs well.



**C&CC:** The future battlespace is changing rapidly. How is DHA preparing for it?

**LTG Crosland:** I mentioned earlier that our medical research leaders work closely with our Service counterparts, the Joint Staff, and COCOMs to anticipate what that future battlespace may look like, and what that means for our operational medicine requirements.

There are a few things we know to be true. First, in a number of scenarios, we are likely to have forces spread more widely across a much broader geographic areas. We'll also potentially be operating with smaller units in these scenarios. We need our medical teams to be able to operate independently for longer periods of time than was the case in Afghanistan or Iraq. In some cases, the senior medical expert may be a corpsman or medic.

What does that mean for us? Well, the investments we are making in digital health aren't just for peacetime. There is a clear and compelling wartime need as well. We need to be able to connect highly specialized experts with junior medical staff in contested environments. We need to bring advanced medicines far forward. We need to anticipate the use of Artificial Intelligence in supporting these units from a medical perspective.

We also need to continue monitoring natural disease threats around the world. And ensure we're developing the vaccines and countermeasures to mitigate the threats from these pathogens. COVID was a warning to all of us how rapidly diseases can spread, particularly when airborne.



Members of the 555th Forward Surgical Team prepare a simulated trauma patient for surgery during training with the Strategic Trauma Readiness Center of San Antonio (STaRC) at Brooke Army Medical Center, Fort Sam Houston, Texas, May 28, 2020. The STaRC training program leverages the expertise and capabilities across multiple healthcare disciplines at BAMC, the U.S. Army Institute of Surgical Research, the Medical Center of Excellence, the Joint Trauma System and the Air Force 59th Medical Wing to provide deploying surgical teams with the most realistic and comprehensive wartime skills certification. (U.S. Army photo by Jason W. Edwards)

At DHA, we're working on all of these things in close coordination with everyone we support. We do nothing alone. It's all of us, closely collaborating on the top priorities outlined in the national security and national defense strategies.

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SCAN ME

# TARGETING SPECIALIZED TREATMENT TO TRAUMA-DRIVEN NEED

The Combat Casualty Care Research Program (CCCRP), run out of Ft. Detrick, MD, employs current and prioritized efforts in prolonged care to optimize trauma care delivery tailored to the unique needs of varied trauma sustained.

By Hayley Rogers, Combat Casualty Care Research Program



Medical personnel perform surgery in field hospitals designed for prolonged care settings. (U.S. Army photo)

Since 1992, the Combat Casualty Care Research Program (CCCRP) has worked to optimize survival and recovery from combat-related injuries. Operating under the Defense Health Agency and United States Army Medical Research and Development Command, the CCCRP oversees a variety of portfolios striving to advance the Military Health System. Derived from the focus and guidelines of Tactical Combat Casualty Care, the CCCRP's Prolonged Care Portfolio is dedicated to supporting Warfighters beginning at the point of injury.

The Prolonged Care Portfolio is managed by Civilian Portfolio Area Managers Dr. Kimberly B. Pope, Dr. Jenifer Ojeda, and Leidos support contractor Dr. George Jiang. The CCCRP's leadership team is led by Director, CAPT Travis M. Polk; Military Deputy Director, MAJ Carl Smith; and CCCRP Civilian Deputy Director, Dr. Therese West.

The portfolio focuses on improving medical capabilities during extended time spent within each role of care. Aiming to reduce morbidity and mortality, the CCCRP's prolonged care team works with organizations conducting research and developing new technologies, devices, procedures and knowledge products to drive medical innovation.

"We strive to support research and technologies that will enhance clinical recommendations and optimize care for wounded Warfighters," says Pope. "We work with subject matter experts, research and development teams and the individuals who will use these products and guidelines, ultimately delivering solutions that will make a positive difference in the care that medical and non-medical personnel can provide on the battlefield."



Dr. Kimberly B. Pope

## FOCAL AREAS OF CONCENTRATION

The Prolonged Care Portfolio focuses on four main research areas: advanced imaging, resuscitation and critical care, surgical support, and wound management. The following subsections offer a brief overview of some current efforts within each research area.

### ADVANCED IMAGING

Imaging technologies are used to diagnose emergent conditions after injury. The availability of such technology has improved the accuracy and effectiveness of triaging and treating combat casualties. Though imaging is the standard of care for civilian trauma centers and later roles of military medical care, it is not always available for use in austere environments. Adding to the challenge of imaging in the field, medical training is required for proper utilization of the machinery and accurate interpretation of the results.

The Prolonged Care Portfolio is currently working with organizations focused on innovative imaging technologies, such as computed tomography, or CT, to meet objectives like portability and low-power consumption. With an additional aim for automatic interpretation of results, these technological advances may allow for fewer requisite operator skills while also reducing the risk of human error. The availability of such imaging systems across the full spectrum of care would positively impact diagnosis, surgical management, and patient movement.

## RESUSCITATION AND CRITICAL CARE

Surveying for severe blood loss, hypoxia and other high-priority complications is necessary to signal immediate and accurate intervention. Time-sensitive injuries are most prevalent and best treated in prolonged care scenarios, provided that medics are present from point-of-injury through evacuation. Though prolonged care interventions follow trauma care clinical practice guidelines, hemorrhage, traumatic brain injury, polytrauma and wound complications remain a major cause of death and disability among the military population and are more likely to occur in prolonged care scenarios.

Recognizing the need for improvement in resuscitative guidelines, the Prolonged Care Portfolio is collaborating with the CCCRP's Battlefield Resuscitation and Immediate Stabilization of Combat Casualties Portfolio to fund projects that target hemorrhage and shock, transfusion, airway management, wound care and complications, polytrauma and more. These studies will evaluate current clinical interventions and provide data to fill knowledge gaps and improve morbidity and mortality rates among the military and civilian populations.

"As patients are likely to be held longer in the field, the capability to provide critical care becomes increasingly important," says Pope. "The Prolonged Care Portfolio invests in development of technologies to support critical care in austere environments, such as wearable medical monitors, advancements in extracorporeal life support and production of medications and consumables, like dialysate, far forward. The portfolio is also supporting efforts aimed at optimizing oxygen provision on the battlefield."



CAPT Travis M. Polk

The Prolonged Care Portfolio funds organizations focusing on early strategies and interventions that may mitigate the rate and severity of infections. Funded projects focus on the unavoidable constraints within prolonged care settings and aim to collect data that will help to identify the specific factors associated with infection complications. The acquisition of these knowledge products will subsequently benefit the civilian population, in which wound infections account for a substantial percentage of emergency department cases.

## PARTNERING FOR GREATER KNOWLEDGE

"We have a solemn obligation to provide the best care to our nation's injured Warfighters," says CAPT Polk. "In addition to developing novel solutions that save lives, accelerate healing, optimize functional recovery, and improve the quality of life for our wounded service members, everything we develop needs to be geared-to and compatible-with the battlefield and future, large-scale combat operations."

The Prolonged Care Portfolio is funding over 80 intramural and extramural projects in Fiscal Year 2024. The portfolio, and the entirety of the CCCRP, are always eager to partner with dynamic institutions, companies and organizations. To learn more about the CCCRP's efforts, please visit: <https://cccrp.health.mil/>. To submit a proposal or new product idea, please visit: <https://cccrp.health.mil/work-with-us>.

## SURGICAL SUPPORT

Though it is well understood that austere environments are not ideal for surgical care, circumstances often dictate the necessity of this type of intervention. Because prolonged care typically arises due to limited evacuation capabilities, the prospect of surgical intervention depends heavily on the tools available—leaving units with the limited resources available in their rucksacks.

Given this limitation, reusability of surgical tools is essential. The current methods to sterilize instruments include autoclave, steam, exposure to dry heat and chemical antiseptics. Though these methods are reliable, mechanical and steam sterilizing devices are large, require high-power input and several hours to clean, dry and cool instruments.

Aware of this technology gap, the Prolonged Care Portfolio is working with organizations to support the need for sterilized instruments in the far-forward environment. This includes projects aiming to enhance the efficiency of sterilization mechanisms, as well as projects aiming to bypass sterilization efforts and focus instead on the 3-D printing of surgical instruments. The latter effort intends to build upon current 3-D printing technology, with a focus on adjusting to challenges unique to military medicine.

## WOUND MANAGEMENT

Wound complications remain a leading cause of morbidity and mortality in the military and civilian populations. Due to the contaminating nature of objects that penetrate the skin during events such as blasts, infections develop quickly and frequently in Warfighter wounds.


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# MULTI-CASUALTY SCALABILITY AND ADAPTABILITY

Athena GTX, Inc., an innovator of patient monitoring systems, recently obtained Food and Drug Administration 510K Clearance for its Wireless Vital Signs Monitor (WVSM) Pro Series, an integration of wireless technology and mobile point-of-injury capability.

By Mark Darrah, Ph.D, Chief Executive Officer

Athena GTX has always been keenly focused on the Voice of the Customer (VOC) in designing and developing innovative First Responder medical monitoring solutions. Many of our competitors say that they are as well, but very few will spend the time, and resources needed to truly understand the customer's needs and unique applications. I spent my early career at Brooks AFB and then McDonnell Douglas designing and developing life support systems for fighter jets, and interfacing with aircrews on systems design and cockpit layouts. I learned to listen intently to understand what a pilot really needs and wants. At Athena GTX, the ability to listen is a hallmark of the company.

Long before 9/11, we became enamored with the technologies of wireless communications in the medical markets we serve, way back in the beginning of PDA's, Blackberry, satellite phones, and laptops which led to the huge explosion of cell phones, operating systems, and tablets; being able to engage the operators with a way to not just communicate with each other, but to allow information sharing and command and control of multiple casualties simultaneously. The tactical concept of longitudinal situational awareness (LSA) in the medical space became our focus and our passion in almost all we did. That concept, and several evolving prototypes, with novel display and graphical user interface (GUI) concepts taught us that not only size and weight were drivers in enabling far forward care but the ability to acquire key patient information quickly and assessing overall summary states efficiently could save lives. Through numerous developmental contracts, both civilian through the National Trauma Institute in San Antonio, and multiple U.S. Army, SBIRs, MTEC Awards, Special Operations Command efforts, and U.S. Navy RDTE contracts, we learned a ton and evolved to a business model centered on point-of-injury (POI), pre-hospital solutions that make a difference.

## ADDRESSING MODULAR CRITICALITY

The Wireless Vital Signs Monitor (WVSM), first FDA cleared in 2010, was ahead of its time. Our new series, the WVSM Pro™, follows suit. During a mass casualty scenario, multiple WVSM Pro devices are configurable to the patient's needs and deployed and utilized by trained first responders in coordination with local hospitals. As first responders, the key was smart assistance of patients, leading to hospital systems that remotely monitor and triage patients from emergency rooms or trauma centers using ADMS (Athena Device Management Suite) software to prepare for patient arrival. Our solutions became wearable, and expertly configured as a smart system; knowing what sensors are connected and adjusting the monitor's display and device functionality accordingly. Patient data is automatically recorded and remotely viewable using ADMS. The color-coded vitals provide first responders a quick overview of multiple patients, enabling priority assessment based on injury severity.

The WVSM Pro Series monitors are the next generation devices from Athena GTX that prove, once again, we listen. The Pro series of remote, highly-mobile monitoring platforms significantly extend the capabilities of the legacy WVSM. Although WVSM has sold thousands since its first FDA clearance, it was time to upgrade the platform and inculcate the highly sought after features our customer base told us they needed most. The device can go where other monitors cannot, and now the WVSM Pro™ continues the game-changing need for multi-patient, wirelessly enabled monitoring when coupled with FDA-cleared ADMS connectivity software.

## MULTI-PURPOSE, MULTI-SECTOR APPLICATION

An adaptive, modular, smart, lightweight, miniature, highly mobile, and connected Advanced Life Support (ALS) patient multi-parameter monitor, the WVSM Pro™ has multiple applications across the military and civilian sectors:

- Battlefield Triage
- Missionized Wearables
- Border Patrol
- Community Paramedicine
- EMS Transport
- Emergency Department (ED)
- Extrication
- Fire Rehabilitation
- HAZMAT/Patient transport
- High Angle Rescue
- Infectious Disease
- Major Event
- Mass Casualty Incident
- Mass Casualty Vehicle
- Medical Surge
- Multi-Patient
- Bike Patrol
- Remote Medicine
- Search and Rescue (USAR)
- Tactical Medicine
- Telemedicine
- Home Care
- Triage
- Water Rescue
- Diver wearables

## PINPOINTED FLEXIBILITY AND MOBILITY

In situations where time is short, access is restricted, space is limited, and multi-casualties may be present, the WVSM Pro solves the most challenging, remote, first responder situations. Our new, lightweight monitor combines advanced life support (ALS) and basic life support (BLS) capabilities, offering a three-in-one solution at a fraction of the cost. Weighing just over a pound, it is a game changer for tactical monitoring with global interest and application.

# A new patient monitor designed to meet the needs of elite care providers



## WIRELESS VITAL SIGNS MONITOR – PROFESSIONAL VERSION (WVSM PRO™)

We updated the current WVSM® medical monitor to the Professional Version (Pro). This integrates advanced connectivity, a new, larger and touch enabled display, and added sensing to produce the first ever full Advanced Life Support (ALS) variant of the original Basic Life Support (BLS) monitor while retaining the form factor, size and weight. WVSM Pro's platform allows users to buy fully enabled ALS or tailor the monitor features they want most. It's a smart system that knows what sensors are connected and adjusts monitoring accordingly.

During a mass casualty scenario, multiple WVSM Pro devices are deployed and utilized by trained first responders in coordination with local hospitals. As first responders assist patients, hospital systems can begin to remotely monitor triage patients from emergency rooms or trauma centers using ADMS software in order to prepare for patient arrival.

- Mainstream and Sidestream capnography
- Remote connectivity – fully compatible with Athena Device Management Suite software
- Casualty Summary State Index (CSSI)
- Wireless Monitoring up to 475 feet
- Monitor multiple patients simultaneously with ADMS
- Over 12 hours of battery life!
- Automatically records and transmits patient vitals
- Streamline patient data from pre-hospital to recovery
- Color-coded vitals provide the data medics need without overwhelming first responders
- Wireless Connection capabilities include: AP (Access Point), BLE (Bluetooth), Ad-Hoc (iOS only) and Wi-Fi Direct (Android only)

Athena GTX produces wireless, mobile, patient-worn, multiple casualty monitors to assist in point of injury triage and treatment decisions. We serve military and civilian markets related to medical state and smart monitors for first responders. Our devices allow personnel to connect with patient data remotely extending monitoring capabilities further into the field.

[athenagtx.com](http://athenagtx.com)



### GENERAL

**Weight:** Approximately 23 oz (0.65 kg)  
**Dimensions:** 2.75 in (6.99 cm) x 4.45 in (11.30 cm) x 5.9 in (14.99 cm)  
**Typical Operating Time:** 12.5 hours (Up to 20 hours in Low Power Setting)  
**Ingress Protection:** IP54

### CONFIGURATIONS

**WVSM Pro (ALS)**  
• 12-Lead ECG, NIBP, Pulse Ox, Temperature, Capnography  
**WVSM Pro (BLS)**  
• 5-Lead ECG, NIBP, Pulse Ox, Temperature  
**TVSM**  
• NIBP, Pulse OX

### PATIENT MODES

Adult, Pediatric, Neonate

### COMMUNICATIONS

**Modes:** WiFi (802.11), BLE, Cable  
**Wireless Range:**  
• WiFi: Up to 475 feet (line of sight)  
• BLE: Up to 110 feet (line of sight)  
**Device connections to ADMS:**  
• WiFi: Up to 20 devices  
• BLE: Up to 6 devices  
**Wireless Capabilities:**  
• Wi-Fi (AP Infrastructure, Ad-hoc, Wi-Fi Direct) and BLE



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# SAVE THE DATE

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**CALENDAR OF EVENTS**

<b>AUG 26 - 29</b> <b>MHSRS</b> Gaylord Palms Kissimmee, FL Mhsrs2024.com	<b>SEP 24 - 27</b> <b>Future Force Capabilities</b> Virginia Beach, VA NDIA.org/events
<b>SEP 3 - 5</b> <b>Commercial UAV Expo</b> Las Vegas, NV Expouav.com	<b>OCT 1 - 3</b> <b>Global SOF Europe</b> Bratislava, Slovak Republic Gsofeurope.org
<b>SEP 9 - 13</b> <b>EMS World Expo</b> Las Vegas, NV Emsworldexpo.com	<b>OCT 14 - 16</b> <b>AUSA Annual Meeting</b> Washington, DC Meetings.ausa.org
<b>SEP 16 - 18</b> <b>AFA Air Space Cyber Conference</b> National Harbor, MD Afa.org/air-space-cyber-conference	<b>OCT 16 - 17</b> <b>DoD/VA &amp; Gov Health IT</b> National Harbor, MD Healthit.dsigroup.org
<b>SEP 17 - 19</b> <b>Int'l Conference of Military Medical Schools</b> Bethesda, MD ICMMS2024.usuhs.edu	<b>OCT 24 - 26</b> <b>Expeditionary Warfare</b> Laurel, MD NDIA.org/events



# SAVE THE DATE

# SOMA | 2025

**May 5 – 9, 2025**

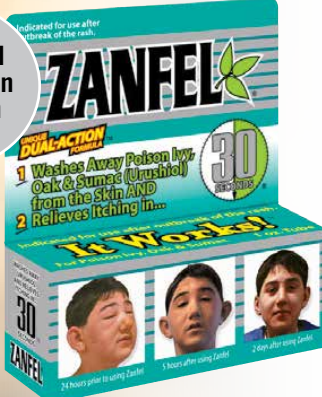
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- Distribution and Pricing Agreement DAPA (SP0200-03-H-0008)
- Defense Logistics Agency ECAT PMCE Contract (SPE2D1-21-D-0010)
- VA SAC MSPV BPA (36C24122A0060)



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