MHSRS Review
2017

COMBAT CASUALTY CARE RESEARCH PROGRAM
U.S. ARMY MEDICAL RESEARCH AND MATERIEL COMMAND
https://ccc.amedd.army.mil

If life teaches us anything, it's that success never comes easy. Achieving sustained success, therefore, must be even more difficult to hold and maintain. And yet since its inception, the Military Health System Research Symposium has managed to both achieve and secure success by becoming, in many ways, a direct reflection of its attendees; a constantly changing and constantly adapting entity solely concerned with the advancement of military medicine. And yet despite all those moving parts, despite all that change, the people who populate the MHSRS maintain a stunning consistency of effort that is very much integral to the overall success of the MHSRS; the attention to detail, the depth of desire, and, of course, the constant focus on the mission at hand. These are also hallmarks of the MHSRS itself, which has become known over the years as a launchpad for the next-generation ideas critical to conquering the battlefield of the future.

In short, the MHSRS is where the brightest minds in the country focus exclusively on the well-being American warfighter.

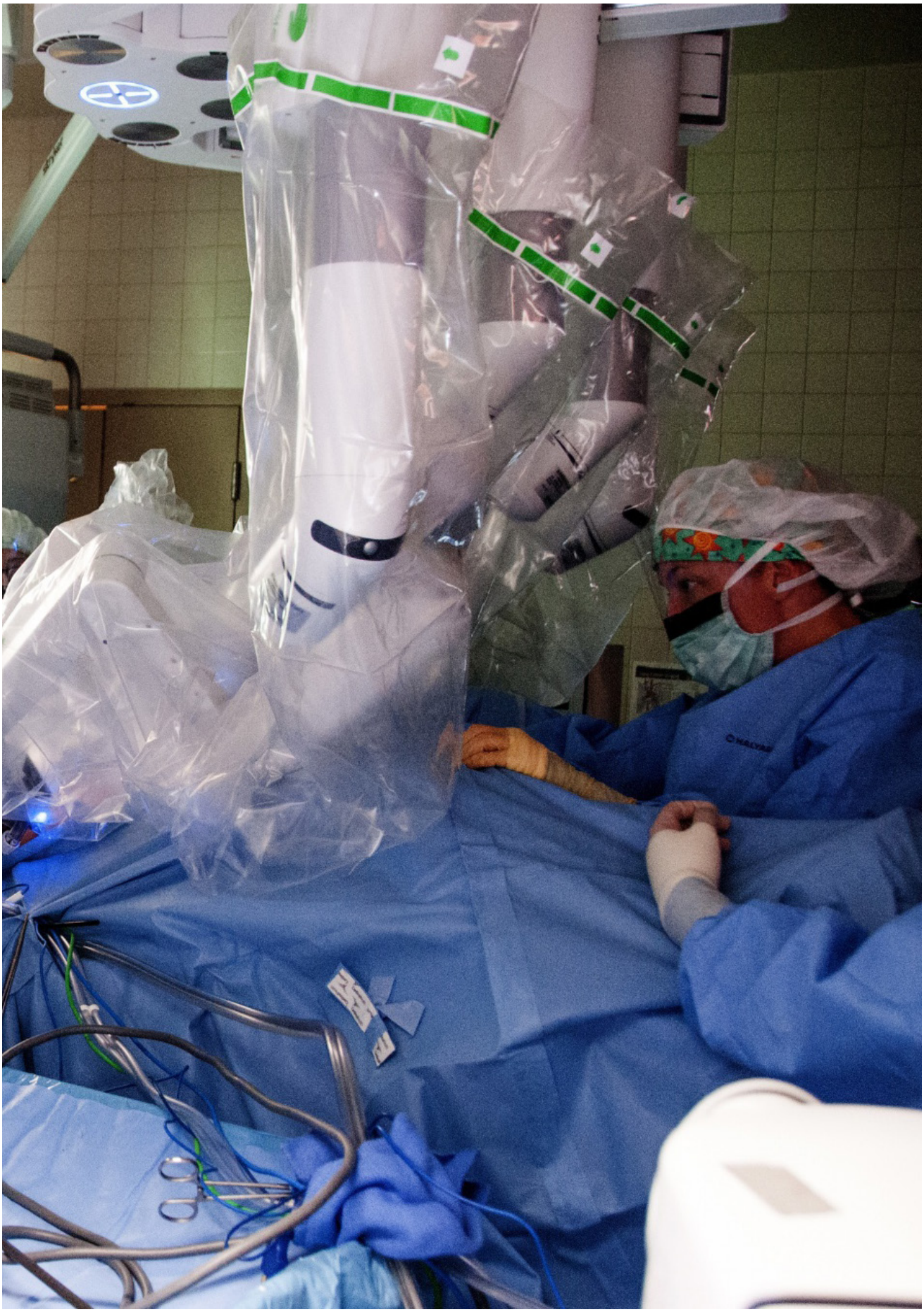
This focus will no doubt be key as the U.S. moves closer to what experts are now calling the "future battlefield" – a forecast for conflicts in the 2025-2040 timeframe which will likely see combat operations move increasingly towards dense, urban, and near-peer environments; settings far different from previous conflicts, and further, ones that will likely preclude many of the established lines of authority the U.S. has enjoyed in previous efforts. In these austere environments, caring for the warfighter will be of the greatest importance.

So it is in that vein that we present the 2017 MHSRS Review, a brief roundup of the sights, science, and high-profile reactions culled from the 2017 MHSRS. Held in Florida in late August, the 2017 MHSRS featured more than 2,700 attendees from the military, academic, and private-sector worlds en-route to breaking records for the number of abstracts submitted (1942), the number of breakout sessions held (66), the number of exhibitors (108) and the total number of reviewers (300). Numbers like those only solidify the notion that the MHSRS is, indeed, the crown jewel of the military medical event calendar; a place where modern science and endless possibility combine to expand the reach of both those concepts in real and palpable ways.

By gathering this small and varied collection of news articles, photographs, and first-person accounts of the benefits of MHSRS, we hope to give you a taste of all the symposium has to offer - a brief overview of all the people and successes that this event has allowed us to highlight, meet, and applaud. We bring you this material here, now, so that you may see more clearly where our research stands today, and where our research will focus tomorrow.

Said Maj. Gen. Barbara R. Holcomb during her keynote speech to open the 2017 MHSRS, "The way we've been treating casualties in the past will not work in the future, and so our new reality begins now." Perhaps by taking time for a quick look back at the 2017 MHSRS, we are already well on our way to achieving that goal.

MHSRS 2017



PROLONGED FIELD CARE THE 'NEW NORMAL'

"The CCCRP specifically [is] in a great place to leverage our current portfolio knowledge into positive, far-reaching change."
Lt. Col. David Johnston, Military Deputy, Combat Casualty Care Research Program

KISSIMMEE, Fla. -- "The battlefield of the future is already here," said Maj. Gen. Barbara R. Holcomb during her keynote speech at the 2017 Military Health System Research Symposium Aug. 28 in Kissimmee, Florida. "And so as a result, the medical force of the future must be here as well."

As the Commanding General of the U.S. Army Medical Research and Materiel Command and Fort Detrick, Maryland, Holcomb highlighted prolonged field care, which military leadership designated in a Capabilities Needs Analysis as the number one capability gap across the Army.

"We need to adjust both the way we think and the way we execute," said Holcomb. "And we need to understand that the multi-domain battlefield of the future will not always offer optimal --or even desirable-- casualty care scenarios."development in robotic surgery on the battlefield.

During her presentation, Holcomb described evolving technologies and supporting capabilities designed to support patient care in austere environments, including battlefields composed of far more dense and urban settings than current combat scenarios.

These technologies include unmanned platforms to aid Warfighters in far-forward areas by delivering blood products and telehealth support.

Holcomb also highlighted Army Medicine's investment in cutting-edge development in robotic surgery on the battlefield.

"This shift towards prolonged field care is a welcome challenge for both the Army and the Joint Program Committees," said Lt. Col. David Johnston, Combat Casualty Care Research Program military deputy. "For the CCCRP specifically, we are in a great place to leverage our current portfolio knowledge into positive, far-reaching change."

One example of that change can be seen in the Army's use of life support for trauma and transport -- or LSTAT -- technology. By integrating several miniaturized, commercially available medical devices into a self-contained platform that allows seamless transfer of a wounded Soldier from one echelon of medical care to the next, the Army is hoping the LSTAT will increase survival rates by putting sophisticated trauma equipment directly into the hands of medics on the battlefield.

For Holcomb, it's that type of thinking that represents the leading edge of a program-wide change that will likely set the tone for combat medical care for the next generation and beyond.

Said Holcomb, "The way we've been treating casualties in the past will not work in the future, and so our new reality begins now."

TRAINING, TECHNOLOGICAL SYNERGY KEY TO FUTURE BATTLEFIELD CARE SCENARIOS

"We are still fighting the new war with the tools from the old war, and that has to change." -

Lt. Col. Andre Cap, Chief of Blood Research, U.S. Army Institute of Surgical Research

KISSIMMEE, Fla. -- The first slide on the screen during Maj. Doug Powell's panel presentation on prolonged field care features a blank, colorless slate without any pictures, graphics or images. Instead, there's just a single quote.

"It's not about the technology," the slide reads, "It's about the people."

Powell is the Intensive Care Unit Medical Director at Womack Army Medical Center in Fort Bragg, North Carolina. He presented at the 2017 Military Health System Research Symposium in Kissimmee, Florida.

For Powell and the rest of the investigators diving head first into the Army's newly-retooled commitment to prolonged field care -- the number one capability gap according to a recent Army Capabilities Needs Analysis -- the quote doubles as both a mantra and a mission statement.

"We carry around one of the greatest and most powerful computers of all time in our pockets every day," said Powell, holding up his cell phone to the audience, "and we use it to play 'Candy Crush.'"

He added, "We can do better."

Given that desire for a more complete, more mature fusion of technology and Soldier, Powell's presentation focused chiefly on the burgeoning telemedicine requirements for prolonged field care in future battlefield scenarios. Products that are flexible, scalable, reliable and convenient are specifically targeted for deployment in the dense, urban settings that experts say will likely dominate combat environments in the coming years.

The presentation highlighted advanced development efforts such as an Air Force Pararescue-Jumper project called BATDOK (Battlefield Airmen Trauma Distributed Observation Kit), which is a cell phone application intended for use on Android platforms. Wireless sensors placed on the patient send aggregated vitals to the computer screen, providing primary responders the ability to make emergency medical decisions. Like a cell phone, the device can be set for three kinds of alerts: auditory, tactical or visual. The alerts notify the medic not only to which patient is in danger, but also his or her vitals.

Situational awareness for receiving field hospitals is also important to provide medical staff on the ground with information that can help them prepare to receive and immediately treat patients.

This need is being addressed by an advanced development effort at the U.S. Army Medical Research and Materiel Command called the Medical Hands-free Ultra-wideband Broadcast system.

The MEDHUB's distinction is its patient care focus and operational situational awareness capability. The goal is to keep the medic or flight paramedic focused for performing life-saving tasks for multiple patients, unencumbered from documentation.

The MEDHUB is designed to automatically capture, store and forward data to the receiving field hospital -- without adding any burden to the medic.

Key components are individual wearable vital sign monitors that record vitals and provide littered or ambulatory status through accelerometers; peripherals to capture patient weight; and an end-user device, such as a tablet or phone, that captures and stores the data.

"Prolonged field care is not a skillset. It's a situation you find yourself in," said Lt. Col. Andre Cap, Chief of Blood Research at the U.S. Army Institute of Surgical Research in San Antonio, Texas.

Both Cap and Powell say that moving forward current capabilities gaps in prolonged field care will include a dedication to the concept of universal interoperability among technological devices, as well as the development of an on-demand, on-call marketplace for continuous communication regardless of location.

Still, the immediate focus remains on strengthening current training, development and execution processes, all while paying special attention to the integration needed to succeed on the future battlefield.

Said Powell, "Whatever we eventually give to the people in the field, I want to make sure it works with what they already have."

For Cap, the synergy of man and machine in future far-forward environments isn't complete without first addressing the existing training gaps in the prolonged field care discipline. To that end, concepts such as a dedicated emphasis on critical care techniques and prolonged resuscitation efforts are incorporated into current medical training regimens. Additionally, leadership has instituted a pilot program focused around those concepts at Fort Bragg, North Carolina.

"We are still fighting the new war with the tools from the old war," said Cap, "and that has to change."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MULTIPLE CHOICES, MULTIPLE ANSWERS AS BRAIN INJURY RESEARCH EVOLVES FOR FUTURE BATTLEFIELD

"It's truly exciting to watch all these efforts take place right here, right in front of you." -

Dr. Tammy Crowder, Neurotrauma and Traumatic Brain Injury Portfolio Manager, Combat Casualty Care Research Program

KISSIMMEE, Fla. – "We're just trying to address as many military needs as possible," said Drexel University Professor Dr. Baruch Ben Dor during his breakout session presentation on cutting-edge traumatic brain injury detection technologies at the 2017 Military Health System Research Symposium in Kissimmee, Florida.

One technology Ben Dor highlighted was an infrascanner device, developed through a multi-university partnership agreement that included Drexel University. The device uses near-infrared spectroscopy technology to locate pockets of intracranial pressure that may, in turn, indicate a potential TBI. By applying multiple sensors to the head, forehead and limbs, the infrascanner measures the absorbance of light at four separate areas of the brain. The device provides data that is then interpreted by a clinician.

This type of technology, which has been previously used to measure the amount of oxygen in a patient's tissue as well as heart rate, may now serve an important role during en-route care and evacuation scenarios in future battlefield situations.

"This is something like ultrasound was 40 years ago," said Ben Dor. "And so we're excited to take that existing technology and then mold it to whatever is needed in the field."

When it comes to the world of TBI, that willingness to "upcycle" already proven technology is now

en vogue as investigators try to not only establish biomarkers for the diagnosis of TBI severity, but also try to develop

non-invasive neurological assessment devices for all TBI. For researchers, the buzzword is "fusion."

"While we'd love to have just one device for all our needs, the reality is that we're taking more of a 'Frankenstein's monster' approach to head injury detection and diagnosis," said Dr. Tammy Crowder, manager of the U.S. Army Medical Research and Materiel Command's Neurotrauma and Traumatic Brain Injury portfolio.

Said Crowder, "We're excited about all the products here, but in many ways they're all just one part of the larger whole."

Given that more 360,000 Service Members worldwide have suffered a TBI since 2000, questions about the cause, scope and impact of TBI far outnumber current solutions. In addition, products currently being developed to aid TBI diagnosis are further complicated by the recent Army-wide focus on prolonged field care, which dictates attention to the concepts of miniaturization and portability in addition to reliability.

"Right now we're working on imaging the entire head," said investigator Dr. Jason Riley, referring to the infrared transcranial hematoma imaging

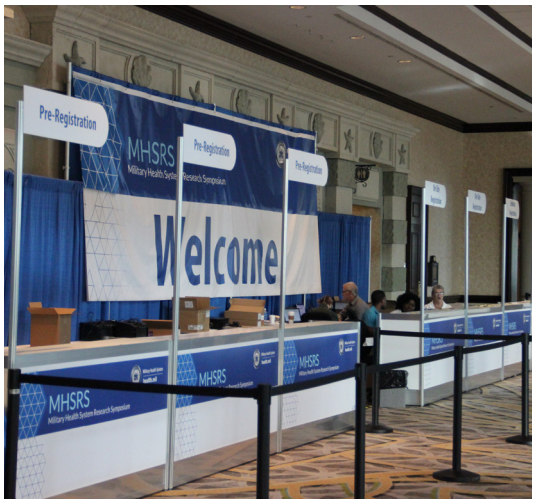
device he developed with his private-sector partners. “And even better, we’ve got the whole thing down to the size of a briefcase, which is a big plus to operators in the field.”

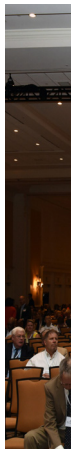
While always a high-profile capability gap for the Army, the process of developing diagnosis solutions for TBI and TBI risk factors now stands at a crossroads where the need for immediate solutions collides with a parallel need for compact integrity. For both Ben Dor, whose device is the size of a supermarket scanner, and Riley, whose device is currently engaged in clinical trials, their respective efforts put them at the very leading edge of TBI research.

Said Crowder, “It’s truly exciting to watch all these efforts take place right here, right in front of you.”

MHSRS 2017

Since the MHSRS exists in an almost constant state of evolution, no single closing statement can ever truly provide the full, thorough, and complete summary of events required for such proceedings. Further, since each iteration of the MHSRS depends so heavily on its predecessor yet is also so clearly influenced by the science of the times, all that a capstone such as this can ever hope to provide is, quite frankly, a snapshot of a moment in time, a simple photograph of people and objects and the individual moments of human collaboration as they existed in that specific moment. This is the downside of fluidity then: that it cannot be either gathered or held –fully held, either physically or theoretically– by any single point or part or section.



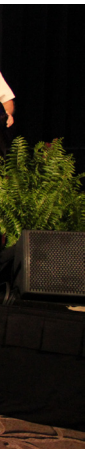


And yet this is not a bad thing. This, after all, how progress works.

Because with so much of the annual MHSRS workload so dependent on new developments and obstacles, it is critical to know exactly where we've been before we can decide where we go next – or even how to get there, really. And even then, once we arrive at our destination, we're faced with new challenges and different challenges; all of them evolving just as we do, just as the people supporting the military medical research infrastructure do on a daily basis. And so it is that vein of deference that we offer this; the briefest of closing statements. Because just as we turn out the lights on the 2017 Military Health System Research Symposium, the next version is waiting in the wings and ready to feature new research, new findings, and turn over new earth; all of it for the sake and benefit of the men and women of the United States military.

And so while we may indeed not be able to capture the intensity and energy of the annual MHSRS is one, single document, we can indeed stand back and watch its trajectory over time - a gift which may be the most fulfilling of all.

Thank you.

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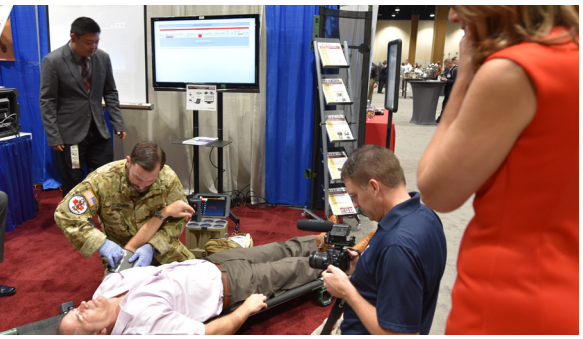


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