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Dr. Jaques Reifman Wins the 2016 Samuel J. Heyman Service to America Medal

Dr. Jaques Reifman, BHSAI Director
photo by Aaron Clamage

The nonprofit, nonpartisan Partnership for Public Service presented eight Samuel J. Heyman 'Service to America Medals' (Sammies) on Tuesday, September 20, at the Andrew W. Mellon Auditorium in Washington, D.C., to remarkable public servants who are making a difference in their communities and improving the lives of Americans and others around the world. One of those recipients was our very own Dr. Jaques Reifman, a U.S. Army Medical Research and Materiel Command Senior Research Scientist and TATRC's Lab Director for the Biotechnology High Performance Computing Software Applications Institute (BHSAI).

Reifman, who was named as a Samuel J. Heyman 'Service to America' finalist, was honored on May 3rd on Capitol Hill in Washington, D.C., as part of Public Service Recognition Week. Dr. Reifman was among those distinguished finalists being recognized and has officially been presented the SAMMIE Medal in the category of Science and the Environment for his work on the APPRAISE project.

Reifman and his team developed an artificial intelligence system, called the Automated Processing of the Physiologic Registry for Assessment of Injury Severity known as APPRAISE, for medics to quickly detect if severely injured patients in transit are hemorrhaging, improving survival rates by preparing trauma centers to act immediately upon the patient's arrival.

Key contributors to Reifman's APPRAISE team included Maxim Khitrov and Jianbo Liu as well as Andrew Reisner, an investigator with the Army's BHSAI lab, and an emergency room doctor at Massachusetts General Hospital.

The Army has received two U.S. patents for the APPRAISE system and is now pursuing Food and Drug Administration clearance and a licensing agreement with a commercial partner.

Gary Gilbert, TATRC's Operational Lab Director, said Reifman "argued for years that we measure many vital signs, but that we don't know if the data we are collecting is actually information we need to be sure someone is in critical condition."

"He had a vision," Gilbert said. "He addressed the need for expediency to help medical personnel in combat."

Reifman said the APPRAISE system offers "an opportunity to save lives on the battlefield" and eventually could be of great assistance to emergency medical personnel throughout the country.

"Not too often do scientists have an idea or a dream, and then over time advance the science to take the concept to deployment and show that it works," Reifman said. "I'm thankful that I'm here at the Army, which provides longevity in funding and support over time." Congratulations Dr. Reifman, on this well deserved, high honor!

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OpTMed Lab Conducts 4th Annual Field Evaluations at CERDEC Ground Activity

During the month of August, TATRC's Operational Medicine Team spent their weeks setting up and preparing for their annual telemedicine evaluation and exercise. By mid-month, the entire team had relocated to the CERDEC Ground Activity (CGA) Range #1 at Joint Base McGuire-Dix-Lakehurst (JBMDL), New Jersey, to conduct advanced concept demonstrations and operational user evaluations of prototype technologies emerging from TATRC's executed research projects. The Operational Medicine Lab manages applied research and pre-advanced development projects for Point of Care (POC) telemedicine and unmanned casualty extraction and, each year, takes them to the field for evaluation with soldiers at the CGA facility. CGA provides an excellent environment to test and evaluate medical devices, sensors, medical information exchange, and tele-health research and development prototypes using the latest U.S. Army Tactical Communications Capability Sets. While this year's evaluations focused on three major efforts: 1) POC wireless medical sensors, encounter documentation, and tele-health; 2) Enroute-care patient monitoring integrated with command and control of unmanned casualty evacuation vehicles; and 3) a cloud-based Theater Electronic Health Record (EHR): the primary focus was on the latter, the feasibility of implementing a cloud-based Theater EHR using service (Army) provided common user command and control tactical communications networks. Measured in terms of that objective alone, the entire CGA Telemedicine event was a success.

To validate the cloud-based Theater EHR concept, TATRC invited a number of university and industry researchers and other MRMC laboratories previously awarded TATRC managed Phase II SBIRs or other research contracts, to work with TATRC and CGA to integrate and test their prototype medical information exchange capabilities on the CGA tactical radio networks. These networks were configured by CGA engineers to provide connectivity from battlefield points of care, through enroute care, to Roles I & II medical treatment facilities (MTFs). Connections were made from those points of care over tactical radios, satellites, and the Defense Research & Engineering Network to remote Armed Forces Health Longitudinal Technology Application - Theater (AHLTA-T) Remote Data Services (RDS) servers developed by PM MC4 and located at Fort Detrick and Aberdeen Proving Ground (APG). Patient monitoring data generated by POC vital signs sensors and telemetry was transmitted wirelessly via ultra-wideband, tunable narrow band, or Bluetooth technologies to an Army Nett Warrior type Android End User Device (EUD) to be posted to an electronic Tactical Combat Casualty Care (TC3)/DD1380 card. The EUD was connected to a riflemen radio, which was used to transmit the data over CGA's implementation of the Army's Joint Tactical Radio System (JTRS) network and a prototype Cross Domain Solution (CDS) at the Brigade Tactical Operations Center (TOC) to the "cloud-based" RDS AHLTA-T servers at Fort Detrick and APG. The prototype CDS enabled unclassified data transmitted over the tactical SIPRNET to cross over to the unclassified military internet where the AHLTA-T servers reside. At the Roles I-III MTFs, a light version of AHLTA-T called Health Assessment Light Operations (HALO), also developed by PM MC4, was used to input new encounters for immediate upload to the remote RDS AHLTA-T servers at Fort Detrick and APG. Once all the components were assembled and network pieces became operational at Range 1, the mobile tactical network and the prototype medical information capabilities were moved to more remote ranges for further testing and evaluation. Not only were points of care EHRs able to be posted to the remote RDS AHLTA-T servers from all points on the exercise battlefield, they could also be readily accessed in short order at the Roles I and II MTFs at JBMDL, and the Role III Combat Support Hospital at Fort Gordon, GA, as soon as they were posted to the MC4 RDS AHLTA-T servers. This was accomplished by using a thin client (web server) access capability developed by PM MC4 and implemented on both wireless notepads and the same MC4 laptops at Roles I, II and III as the HALO capability.

Medic provides electronic, medical point of care encounter documentation.

Another field evaluation focus area was aimed at assessing the concept of integrating Command and Control of Unmanned CASEVAC vehicles with patient telementoring during transport on either ground or air CASEVAC platforms. A combined ground and air unmanned CASEVAC mission was conducted using a rugged AMBOT Unmanned Ground System (UGS), and the Lockheed Martin's K-MAX Unmanned Aerial System (UAS) Platform for patient transport. Integration of an on-board TEMPUS-Pro telementoring system and Neya's Unmanned Systems Control Segment (UCS) Vertical Takeoff and Landing Evacuation and Resupply Tactical Interface (VERTI) notepad were performed on both the UGV and

CERDEC,

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Soldiers utilizing UAS & UGV to support expedited CASEVAC

UAV in order to provide Human-Computer Interface (HCI) and Command and Control (C2) of simulated casualty evacuation missions using unmanned systems, and to provide a transport telemedicine patient monitoring capability while enroute using a UCS implemented Telemedicine Reference Architecture. Arranging for a full sized man rated UAS, like the K-MAX, to execute this field evaluation at JBMDL was a major accomplishment made possible by the material support of the USAMMA PM MEDEVAC.

At the end of the evaluation, TATRC hosted a Visitor's day demonstration to give the broader military medical community a glimpse of the previous 3-weeks of operational and technical field assessments supporting Defense Health Program research investments in Operational Telemedicine. Visitors were exposed to a variety of field scenarios including prototype technologies for telementoring and casualty care documentation, integrated patient telemonitoring & command & control of ground and air unmanned systems in a simulated CASEVAC mission, as well as several radio network architectures supporting ground to ground, ground to air, and air to ground medical information exchange using a variety of medical and mobile devices. Participants at the Visitor Day came from across the enterprise and included representatives from JPC-6, USAMMA, USAMMDA, USARIEM, USAARL, USAISR, Marine Corps Warfighting Lab, ONR, AFRL, AFMSA, DHA, PEO DHMHS, PEO Soldier, PM JOMIS, PM MC4, PM MEDEVAC, AMEDD C&S MEPD and JTAPIC, as well as five US SOCOM organizations. A thorough "hot wash" discussion was conducted at the end of the day. While comments from the participants varied, all agreed the event was worthwhile and beneficial.

Operational Telemedicine Lab Director, Dr. Gary Gilbert stated, "Our CGA evaluations of telehealth and medical information exchange research projects in the field with soldiers is probably the most important activity we do as a lab. We go to CGA to identify major technical or operational weaknesses early during the research phase, before advanced development begins, so that development strategies can be adjusted before significant investments are made. Over the years, I have seen so many new capabilities, already at or near full development, fail miserably when they are first put in the hands of Soldiers. Only from Soldier-user feedback in the field and direct observation of performance on real, tactical networks, can you effectively assess the potential of new medical information technologies for operational use. If, as I suspect, those attending our visitor's day went home with an appreciation for that aspect of our research, the day was more than successful."

RIMPAC Exercise Highlights Value of Multi-Service, Joint Research Collaborations

Personnel from TATRC's Operational Telemedicine (Op T-med) Lab were invited to attend and observe the "Rim of the Pacific" (RIMPAC) exercise by the Marine Corps Warfighting Laboratory's (MCWL) Officer in Charge of Medical Experimentation, LCDR David Gribben. TATRC and MCWL are research partners investigating Maritime use of telemedicine capabilities. Mr. James Beach, Project Manager for Op-T-med, represented TATRC during the exercise conducted 29-30 July 2016 at Camp Pendleton, California.

The MCWL objective was to conduct a baseline experiment focused on employment of standard Enroute Care Teams, Shock Trauma Section (STS) Capability, and enhanced Forward Resuscitative Surgical System within a Marine Expeditionary Force that is conducting forcible entry operations in a denied environment. Casualty evacuations and resupply were conducted using MH-53E Helicopters and MV-22B Osprey Vertical Take-Off Landing (VTOL) Aircraft, as vehicles of opportunity. The experiment was designed to identify the minimum organizational, clinical, and logistical requirements by deployment of the lightest possible footprint, for providing initial care during a forcible entry operation.

Contributions from TATRC, such as

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Members of a STS receive instruction on the Tempus Pro Physiological Status Monitor.

RIMPAC, *Continued from page 3*

loaning of Tempus Pro Physiological Status Monitors, allowed the MCWL to validate operational concepts in providing real-time patient status information in a Medical Common Operating Picture. James Beach stated, "There are many common problem sets facing both Services. Our collaboration between the MCWL and TATRC, enabled the Marines to prove the concept for using medical data to inform a [Medical] Common Operating Picture and provide insight into Marine Warfighting Concepts that may be employed in the Army."

The medical evaluations of RIMPAC were focused on validation of concepts and not on technical testing of final solutions. The concept evaluations were not limited to specific solutions; rather, they supported the overall concept of a light weight, easily transportable, expeditionary medical capability to support forcible entry operations until later phases of an operation brings more medical capability to bear. The concepts could easily be translated into early entry warfighting concepts for Light Divisions in the Army. Some of the research could potentially be further expanded to result in reduced footprints of deployed Army military treatment facilities.

TATRC Gets Involved in September's Suicide Prevention & Awareness Month

September has been designated Suicide Prevention and Awareness Month. In 2012, the VA released a Suicide Data Report that an average of 22 Veterans are lost to suicide every day. Suicide prevention is a very difficult task to undertake, especially when the general public is unaware of the issue in the first place. In order to prevent or "fix" a problem, one must first learn and understand the problem itself and its causes. By educating ourselves, we are able to identify the triggers that can lead someone to thoughts of suicide, and confront those issues as they come, rather than letting them accumulate into something much worse.

Mr. Tim McCarthy, TATRC's Deputy Director "gives a set."

This problem not only plagues the military population, but the civilian population as well. A recent Social Media campaign, initiated by the organization 22KILL, has taken off and includes celebrities, civilians, Veterans and more, all working together and showing support to raise awareness for the 22 Veterans a day statistic. The name "22KILL" is meant to grab people's attention and not just raise awareness about Veteran suicide, but also to highlight mental health issues that can lead to suicide. These issues stem primarily from conditions such as PTS and TBI, and struggles of transitioning out of the military.

TATRC Director, COL Dan Kral, does daily pushups in his office.

Hashtags can be found with the #22pushupchallenge or #22pushups all over various Social Media Platforms. Team TATRC worked this September to also raise awareness on Suicide Prevention and TATRC's Director, COL Dan Kral led the way and encouraged everyone to participate. Team members have been "caught in the act" of doing their 22 pushups all over our Lab. COL Kral has been known to tell his staff to "drop and give him a set" before a meeting starts. TATRC has been proud to push the envelope with their pushups and help in this small way to try to raise awareness on this very important topic.

Don't ever be afraid to reach out and check in with your friends, family and co-workers! It can make all the difference in the world. Please be aware of the countless programs out there to assist people who are in these dire situations.

For the military, if you are experiencing a crisis, or have a friend or family member in crisis, call: 1-800-273-talk (8255) press '1' for the military crisis line or text to 838255. For more information go to: www.militarycrisisline.net.

Civilians can contact the National Suicide Prevention Lifeline at 1-800-273-8255 or visit the National Suicide Prevention Lifeline at www.suicidepreventionlifeline.org.

Geoff Miller, Nate Fisher, and Jeff Levy participate in Suicide Awareness Month.

TATRC Plays a Part in AIS3 Summit Where Innovation Takes Collaboration

Innovation takes collaboration. That was the message from the U.S. Army Materiel Command's (AMC) top leader as AMC co-hosted the U.S. Army Innovation Summit 3 (AIS3) with the Army Training and Doctrine Command, at the College of William and Mary, School of Education, August 16 – 17 in Williamsburg, Virginia.

TATRC's Deputy Director, Mr. Tim McCarthy and Program Manager, Mr. Dave Williams, attended the AIS3 where TATRC was one of 30 DoD Exhibitors selected to participate. This gave Mr. McCarthy and Mr. Williams the opportunity to engage in various discussions with current and former DoD partners from both military and civilian sectors. These dialogues focused on how TATRC has been an integral partner spurring development and innovation in various areas of Military Medicine.

The event brought together more than 250 leaders from industry, academia, DoD and the Army to explore processes to achieve innovation, expand collaboration efforts, and refine innovation initiatives developed at the first two Army Innovation Summits. The three summits are part of the larger Innovation Campaign, initiated by AMC on behalf of the Army in 2015.

The first summit (AIS1) took place in November of 2015 at Redstone Arsenal with representatives from across the Army with a focus on concepts and requirements. AIS1 identified barriers to innovation and ideas on how to overcome them. The second meeting, (AIS2) was held April 4-6, 2016 at Aberdeen Proving Ground and focused on reviewing and refining innovation solutions, assigning ownership / collaborative partners, and implementing "Action Plans."

BG John Cho, Deputy Chief of Staff for Support, MEDCOM, visits TATRC's Mr. Dave Williams and Mr. Tim McCarthy at TATRC's Exhibit Booth during the AIS3.

General Dennis L. Via, of the United States Army Materiel Command (AMC) stopped by the TATRC Booth to talk "technology and innovation" with TATRC's Mr. Tim McCarthy & Mr. Dave Williams. General Via assumed responsibilities as the 18th commanding general of AMC on August 7, 2012, headquartered at Redstone Arsenal, AL.

In this third gathering, leaders from across the Army, along with members of industry and academia, met to examine the Army's innovation efforts within its mission to equip and provide for the Soldier. AIS3 provided a cost-effective platform for the Army and other senior government leaders to engage key audiences, articulate Army strategic priorities and serve as a mechanism to establish critical relationships with academia and industry leaders for innovation. The event explored and highlighted different aspects of innovation for an unpredictable global security environment out to the year 2025 and beyond.

In his opening comments, AMC Commander Gen. Dennis L. Via said, "It is critical to take a moment to pause, slow down and ask ourselves are we doing things right, and more importantly, are we doing the right thing. You can't achieve innovation all at once, it takes time and collaboration."

USAMRMC & Ft. Detrick Bid Farewell to MG Brian Lein

On Thursday, 28 July, the U.S. Army Medical Research and Materiel Command (USAMRMC) and Fort Detrick Community said "Farewell" to outgoing Commander, Maj. Gen. Brian C. Lein, as he handed over the reins to Maj. Gen. Barbara R. Holcomb, former Deputy Commanding General for Operations, U.S. Army Medical Command (MEDCOM) and Chief, U.S. Army Nurse Corps, during an outdoor ceremonial Change of Command which took place on the Blue & Gray Parade Field at Fort Detrick.

At the Change of Command ceremony, MG Lein began by saying: "It's a great day to be a Soldier," and went on to say "I'm sad to leave such a great Command, but I am very confident that MG Holcomb will continue to lead this Command forward." He concluded with "One Team…One Purpose! Conserve the Fighting Strength!"

Lein's tenure at Fort Detrick has undoubtedly been a demanding assignment. A job, Lein notes, that he could not have successfully accomplished "without the support, dedica-

STEMS & GEMS Students Return to TATRC for a Science & Technology Tour!

This summer, TATRC was proud to be invited by USAMRMC's Strategic Partnership Office to host once again, two groups of students from the Gains in the Education of Mathematics and Science (GEMS) and Science, Technology, Engineering, and Mathematics (STEM) Programs. The GEMS is an Army-sponsored, summer STEM enrichment program for middle and high school students with an interest in science & technology. The students visited the TATRC team for their annual tour which included an interactive, hands-on experience in telemedicine. The visiting students were able to get up close and personal with our interactive manikins that simulate real, life-like gunshot wounds, which were demonstrated by Mr. Geoff Miller, TATRC's MMSIC Lab Manager. "Getting a chance to share what we do with these young scientists is an absolute pleasure," says Mr. Miller. "They have a true and honest curiosity that is infectious, and one that we hope continues to grow."

STEMS & GEMS Students visited TATRC for a first-hand look at OpTMed's drone.

Additionally, the GEMS students were given a tour of TATRC's PITLab facility and met with Mr. Nate Fisher, TATRC's Operational Telemedicine Program Manager, who spoke to the students on Robotics, Unmanned Aerial Systems & Unmanned Ground Systems, which included a first-hand look at OpTmed's Drones. Mr. Fisher explained how the use of Commercial off the Shelf Technology, combined with custom components, can enhance the research model and spur innovation. Ms. Rebecca Lee, a Biomedical Engineer & Project Officer, also with the Operational Telemedicine Lab, explained the capabilities of the 3-D Maker-Bot Printer and showed a prototype that she printed just an hour before the tour. She talked about how the benefits of rapid prototyping in the research and development process, enables TATRC to transition ideas from concept to reality.

The TATRC Team enjoyed spending time with the GEMS students and thanked them for visiting our lab. We hope that this visit inspires the students to continue exploring the world of science & technology and motivates them to pursue their dreams!

Mr. Geoff Miller, TATRC MMSIC Lab Manager (Left), explains the use of a tissue task trainer to a group of visiting students.

Lein, *Continued from page 6*

tion and passion" of the people working not just here at Fort Detrick, but worldwide within the command. Under MG Lein's leadership, USAMRMC played a critical role in the Ebola outbreak training and deployment efforts, and paved the way for the development of a Zika vaccine.

MG Lein now serves as the new Commanding General at the U.S. Army Medical Department Center and School (AMEDD C & S) at Fort Sam Houston in San Antonio, Texas where he oversees the formulation of medical organization, tactics, doctrine, equipment and the education and training of medical personnel.

Taking over for MG Lein is Maj. Gen. Barbara R. Holcomb. MG Holcomb was the Deputy Commanding General for Operations for MEDCOM. She is the first female Commander of USAMRMC and also its first Commander to come from the Nurse Corps. MG Holcomb will continue to serve as the Chief of the Nurse Corps, a position that she held before assuming command at USAMRMC.

The TATRC team would like to thank MG Lein for his leadership these past two years and wishes MG Lein much success in his new role as the Commanding General at the AMEDD C & S, Fort Sam Houston, TX!

Former MRMC CG MG Brian C. Lein bids farewell during the change of command ceremony
Photo courtesy of USAMRMC

New MRMC Commander, MG Barbara Holcomb, visits Team TATRC

On Wednesday, 10 August, new Commanding General of the U.S. Army Medical Research and Materiel Command (USAMRMC), MG Barbara Holcomb, visited the TATRC team for a TATRC orientation briefing & overview. MG Holcomb met with TATRC's senior leadership and key personnel to gain a better understanding about TATRC's many initiatives and core capabilities, as well as how it supports the Command. TATRC Director, COL Dan Kral outlined the history and current status of the organization, as well as where he sees the direction TATRC is heading in the future, and how it fits into the U.S. Army Medical Command mission. After the formal briefing concluded, MG Holcomb toured the TATRC facility and had a chance to meet and chat with numerous TATRC staff.

"I am excited to be here, and I am really looking forward to working with all of you, learning from you and understanding the complexities of all you do," said Holcomb in her comments.

MG Holcomb assumed command of USAMRMC on 28 July. She is a 1987 Distinguished Military Graduate of Seattle University's Army ROTC where she earned a Bachelor of Science degree in nursing. She earned a Master's degree in nursing administration from the University of Kansas, a Master's level Certification in emergency and disaster management from American Military University, and a Master's in Military Strategic Studies from the U.S. Army War College in Carlisle, Pennsylvania. She is the first female to lead USAMRMC and the first Commander to be drawn from the Army Nurse Corps.

TATRC Warmly Welcomes MG Barbara Holcomb to USAMRMC!

New MRMC CG MG Barbara Holcomb (Left) visits with TATRC Director COL Dan Kral (Right)

Linked Problem List: Enhancing Access to the Clinical Record for DoD and VA Users

Many active duty service members transition to the Department of Veteran Affairs (VA) for ongoing care, especially those with disabilities when they separate from active duty. Many people, including reservists, continue to receive care in both the DoD and VA systems. Clinicians from the DoD and VA need a total picture of the care rendered in both facilities for these cases. In response to the mandates of the National Defense Authorization Act (NDAA) of 2014, the Joint Legacy Viewer (JLV) was selected as a secured, standard-based, integrated read-only view of electronic health record data from the DoD's Composite Health Care System (CHCS) and Armed Forces Health Longitudinal Technology Application (AHLTA), and the VA's Veterans Health Information Systems & Technology Architecture (VistA) Electronic Health Record (EHR) systems, thus eliminating the need for VA or DoD clinicians to access separate viewers to obtain patient information from the other facility.

The Problem List is one of many widgets in the JLV application. It provides a listing of all the active diagnoses, or problems associated with a given patient. When hovering with a mouse over a problem in the list, a user can view the Systematized Nomenclature of Medicine (SNOMED) and International Classification of Diseases and Related Health Problems - 10th edition (ICD-10) codes associated with each problem. If a JLV user clicks on the problem, a more detailed description of that problem is shown including a listing of notes, encounters, orders, procedures, or consults related to that problem. However, links to those artifacts are not readily available from within the Problem List widget. In other words, JLV displays all the problems in its Problem List widget, but its users cannot simply click on a problem and easily see all associated notes, encounters, orders, procedures, or consults.

In AHLTA, linking the associated artifacts with the problems in the Problem List is a standard feature. In a presentation to the Health Information Exchange Work Group earlier this year, COL John Scott, Director for Informatics Policy, Office of the Assistant Secretary of Defense for Health Affairs OASD(HA), clarified the feature this way, "[The] AHLTA Problem List Module creates a powerful navigation aid for record review. Associated encounters, medications, orders, and artifacts are displayed. One click navigation makes it easy to navigate to associated notes and artifacts." To view the associated artifacts in JLV, a user must switch to each respective domain widget and must remember the identifying information about that artifact in order to retrieve the original note, encounter, order, procedure, or consult. This requires several mouse clicks and when a clinician is busy, this often does not get done. As Dr. Reese Omizo of the Defense Health Agency (DHA) Innovation and Advanced Technology Development Division (IATDD) and the VA Office of Informatics & Analytics explains, "users need to be able to make associations between some of the AHLTA associations that are automatically brought in to the Linked Problem List and keep those associations for future use and for shared use." He also believes that, "the Linked Problem List feature in the JLV could change the way users interact with the EHR in a way that allows clinicians to be clinicians again." This prototype is a positive step toward focusing on clinical workflow while addressing the needs of other users that require

COL John Scott (standing) gives a presentation on the AHLTA Problems list to the Health Information Exchange Work Group in which TATRC participates.

Linked, *Continued from page 8*

access to this information such as Veterans Benefits Administration (VBA) staff. "If we build this, there will be a lot of very happy providers out there and patients will get better care," says Dr. Omizo.

To support this goal, the Health Technology Innovation Center (HTIC) recently received research funding from the Joint Program Committee - 1 to create a prototype "Linked Problem List" enhancement feature for the JLV Problem List widget. Leading this project is Ms. Betty Levine, HTIC's Lab Manager and the Principal Investigator for the funded effort, with support from Ms. Ollie Gray, Program Manager and Agile Scrum Master, and Mr. Robert Connors, Project Manager and HIT Subject Matter Expert. The HTIC development team, Ms. Kim Pham and Mr. Chrisjan Matser are also involved with the research effort. Collaborating with COL John Scott, who is also a clinical user of JLV, and Dr. Reese Omizo, Clinical User and Functional Proponent who works half time for the DHA IATDD and half time with the VA Office of Informatics & Analytics as a SME for JLV, eHMP and DoD Interoperability, the HTIC team is using an Agile Methodology to develop the enhanced features. They are contracting with Hokukahu, LLC for development support and subject matter expertise related to the JLV. Hokukahuh developers and SMEs are some of the original creators of the JLV application. Their expertise and support will be instrumental to the development of a prototype of the enhanced Problem List widget.

Members of the Health Information Exchange Work Group discuss the AHLTA Problems list.

This research project will design, develop, and evaluate alternative working prototype enhancements to the current JLV Problem List widget, to include the display of existing associations of data elements and artifacts to Problem List items in AHLTA. This work will subsequently explore the potential to create links to data and artifacts, "on-the-fly," and store and share links to these artifacts among clinicians and other authorized personnel using JLV. These artifacts may include unstructured and structured inpatient and outpatient notes from DoD, VA, and civilian providers; orders; results; medications; and images.

Ms. Levine says, "We expect that access to these health data artifacts will result in greater efficiency of information retrieval from the medical record, improving continuity of care for dual beneficiaries seen in DoD and VA facilities as well as DoD/VA Joint Facilities. The prototype will support continuity of care for Wounded Warrior Service Members transitioning to VA Facilities, and could be used in disability evaluations." This effort will focus on developing the prototypes and enhanced graphical user interface designs, and evaluating initial test user responses to those prototypes and designs.

In Mid-July, a kick-off meeting was held at Madigan Army Medical Center in Tacoma, Washington. During this meeting, the team held their initial Agile Development sessions attended by thirteen stakeholders including developers, designers, and users of JLV. The group developed and prioritized user stories for Increments I and II of the project, and discussed technical alternatives for developing prototype solutions to meet user requirements using various JLV, Defense Medical Information Exchange, and MHS EHR components in the TATRC Early Stage Platform (ESP). The technical team also discussed options for setting up the development and test environment, as well as access to code sets and data for development and testing.

The HTIC is currently establishing the development environment within the ESP at TATRC, and the team is acquiring instances of the JLV application, VistA and AHLTA data exchange services, and access to instances of AHLTA and VistA that are populated with purely synthetic patient data.

Employee Spotlight

New PO Joins MMSIC's Team!

TATRC would like to welcome newcomer, Mr. Jeff Levy to the team. He will be serving as a Project Officer supporting TATRC's Medical Modeling & Simulation Innovation Center. Mr. Levy comes to TATRC by way of the US Navy, where he was on active duty as a Master at Arms (Military Police) for four years and was deployed as part of Operation Enduring Freedom. Mr. Levy has been deployed a total of two times and was also part of the humanitarian assistance efforts to Haiti after the earthquake in 2010. Mr. Levy holds a BS in Psychology from Virginia Wesleyan College and a Masters in Applied Experimental Psychology with a concentration in Human Factors from Old Dominion University (ODU). In addition, he has his certification in Modeling and Simulation from ODU. Currently, he is working on his Project Management Professional Certification (PMP), which he is planning to finish later this year. Mr. Levy, a native Texan, just recently moved to Frederick from Norfolk and is the proud owner of "Randall Roofus," the Basset Hound. Jeff, who is an avid animal lover, enjoys sports and other various outdoor activities. Team TATRC is excited to welcome Jeff aboard!

Mr. Jeff Levy, Project Officer

Ms. Katharine Weaver is TATRC's Q4 Employee of the Quarter!

Congratulations to Ms. Katharine "Kati" Weaver who was named, TATRC's Employee of the Quarter for Q4. Ms. Weaver serves as a Budget Analyst within TATRC's Resource Management Division. While others from the TATRC team also make very important daily contributions to mission success, Ms. Weaver's untiring efforts are the primary reason that TATRC has been able to execute its research funding and put its supporting contracts in place this fiscal year. Ms. Weaver embodies the TATRC ethos of teamwork and support. She works closely with TATRC Program Managers and Lab Leaders to track their funding, reconcile their accounts and advise them on the status of their funds. This has been particularly challenging this year with the influx of funded research proposals from multiple funding sources. She executes fund transfers via FAD and MIPRs, and monitors all of these to ensure funds move forward and are executed. Ms. Weaver has worked closely with all of the Lab Leaders to apprise them of the status of their funds and to advise them on requirements and how to best address them. In particular, she worked closely with the Operational Telemedicine Team executing multiple fund transactions with multiple accounts and multiple customers and maintained meticulous accountability. She also worked closely with the HTIC and mHIC Labs, recommending options for their funding requirements.

Ms. Kati Weaver, *Budget Analyst*

In short, in the face of overwhelming obstacles akin to a demolition derby, or mine field and dealing with all kinds of personalities and tight deadlines, Ms. Weaver somehow works miracles to achieve success and while doing so, she always has a great big smile on her face. Congratulations to Ms. Kati Weaver on a job well done!

Three University of Maryland Alums Become TATRC IPAs

A distinguished former Army Surgeon General once said, "When in the course of human events…you realize that you have bitten off more responsibilities than you can chew, you ask for 'Hep'." Such had become the case for the two government employees managing over 30 research projects within the TATRC Op T-med Lab. With an ever increasing number of research projects to execute, and with the associated government Contracting Officer's Representative (COR) duties expanding to include reviewing, approving, and posting administrative documents, project proposals, technical reports, and invoices to the Wide Area Work Flow system, and Contracting Officer Representative Tracking Tool, Op T-med Lab Director, Dr. Gary Gilbert realized he needed "Hep"!

Thanks to the efforts of our Director, COL Dan Kral and his staff, as well as the support from MRMC leadership, the Op T-med lab was able to convert three positions formerly performed by contractors, to government equivalent employees under the Intergovernmental Personnel Act (IPA). The first new IPA appointment in July went to Mr. Nathan Fisher, TATRC's Mechanical Engineer specializing in Robotics and Unmanned Systems, followed in September by newly retired Lieutenant Colonel, Mr. James Beach, and finally, Mr. Thomas Bigott, both project managers for telemedicine and medical Information exchange research aimed at theater deployed ground forces in tactical environments.


Mr. James Beach

Nathan Fisher holds a BS and MS degrees in Mechanical Engineering from the University of Maryland and Johns Hopkins respectively. Before coming to TATRC as a contract employee, he acquired a strong background in unmanned systems at BAE's U.S. Combat Systems Division. His primary research foci at TATRC is prototyping enabling technologies for future applications of robotic unmanned systems to support military combat casualty care missions, such as medical resupply for prolonged care and casualty extraction from denied or hazardous environments.


Mr. Nate Fisher

James Beach joined TATRC following his military retire¬ment as an Army MSC Lieutenant Colonel after 23 years of service. He earned a BS in Chemistry from the University of North Carolina (Charlotte) and an MS in Management Information Systems from the University of Maryland (Europe). He brings a significant amount of experience in the Defense Acquisition Management System to the TATRC team. As a Defense Acquisition University Certified Level 3 Program Manager, and a certified Project Management Professional, James served as the Program Manager for U.S. Army Medical Research and Materiel Command's Transport Telemedicine Project, responsible for working with numerous stakeholders from the Office of the Surgeon General, to achieve a Material Development Decision into the Technology Maturation and Risk Reduction Phase.


Mr. Tom Bigott

Tom Bigott, a retired Army Master Sergeant, holds a BS in Information System Management; from the University of Maryland and has over 35 years of experience in the Information Technology project management and technical support for military intelligence missions, healthcare and telemedicine systems. He is a proven leader with strong management, administrative and technical skills able to balance multiple priorities with excellent results. His primary and immediate focus at TATRC is in overseeing the JPC-1 funded Medical Cloud Connectivity for Combat Casualty Care (MC5) research project.

Both Tom and James are combat veterans. We welcome all 3 IPAs to their new roles at TATRC. Their "Hep" is badly needed.

MMSIC Lab Expands Capabilities with Analysis Group

Following the peer-review scientific evaluation of the Phase I Advanced Modular Manikin project, the Medical Modeling and Simulation Innovation Center (MMSIC) at TATRC expanded its capability to provide objective scientific evaluations. "Our main goal in this effort is to provide expert insight, analysis and recommendations to Department of Defense (DoD) medical processes, systems, advanced technologies and research, by leveraging the expertise of all of the labs at TATRC" stated Geoffrey Miller, Research Scientist and MMSIC Lab Manager.

The DoD must ensure that MHS personnel are ready and able to sustain, improve, protect, and conserve the health and resilience of Service members for optimal mission performance across global military activities and operations. A substantial portion of this effort is accomplished through the use of efficient and effective training and assessment processes and systems, advanced medical and healthcare technologies, and innovative research efforts. There is a wide range of these activities which address many of the MHS training, sustainment, assessment and patient care delivery needs, however there is little to no formal evaluation of these technologies and activities to best inform funding, acquisition, research and programmatic performance efforts.

The TATRC Analysis Group (TAG) provides a new capacity and capability set to test the effectiveness, reliability, validity, feasibility, practicality, and satisfaction of existing and emerging medical processes, systems, advanced technologies and medical and healthcare research efforts. The ultimate goal of this lab will be to promote the development of advanced medical and healthcare technologies, processes and systems, which will improve skill acquisition, clinical practice and ultimately improve patient outcomes across the DoD through the following guiding principles:

Investigating emerging medical technologies, systems, processes and research efforts,

Evaluating currently available systems, processes, technologies and research activities, and

Informing stakeholders regarding the effectiveness of systems, processes, advanced medical technologies and research efforts across the MHS.

The TAG will employ a modified ADDIE (Analysis, Design, Development, Implementation and Evaluation) model (Figure 1) to build a defined, reproducible process model for conducting a range of evaluation types.

The TAG process model will also serve as a continuous quality improvement measure to review the effectiveness and return on investment (ROI) value of the TATRC labs. The essential phases of the TAG process are outlined below:

Analysis: During the analysis phase, the TAG will select the type of evaluation to be conducted based on the clients identified problem or need, their desired

TATRC believes the TAG will accomplish the goal of providing expert evaluation of advanced medical and healthcare technologies, processes and research activities by:

1. Employing rigorous practices and procedures, using a dedicated, impartial environment that can provide inter-professional and multi-disciplinary assessment, critiques and recommendations at every stage of development, process or function testing.
2. Testing the effectiveness, feasibility, practicality, satisfaction, reliability, validity and durability of emerging and existing medical and healthcare related technologies, processes and research.
3. Assessing current and emerging advanced medical and healthcare technologies, systems, processes and research efforts from the perspective of a number of disciplines and specializations (e.g., including medicine, nursing, allied healthcare professions, human factors psychology, education, engineering, bioengineering, computer science, implementation science, resilience engineering, modeling, simulation and visualization experts).
4. Advising on the research and development, acquisition and utilization of new or currently available technologies to meet the unique needs of the MHS.
5. Ensuring the context of the needs vs. actual performance capabilities of candidate systems are met, and provide recommendations for system and process improvement.

MMSIC, *Continued from page 12*

outcome(s), goals and objectives, existing knowledge and its relevance to the outcomes, and any other relevant characteristics. The analysis phase will also consider the evaluation environment(s), logistical concerns, evaluation implementation methods, and the budget and timeline for the project.

Design: This phase employs a process to specify evaluation objectives that are discrete, measurable, achievable, realistic and time-bound. Identification of potential subject matter experts will be conducted as soon as the candidate system for team analysis has been identified. Evaluation methodology is agreed upon and finalized to ensure it is tied to the desired outcomes. The evaluation team will identify specific criteria; ensuring standardized instruments are appropriately matched to the evaluation purpose. Standards will be identified, such as International Organization for Standardization (ISO) standards, human factors, or standards of practice, evidence-based practice (EBP) or clinical practice guidelines (CPGs). These standards should be identified as having a basis in quality science and pertinent to the targeted population and end user group(s).

Development: This phase constitutes the actual creation (production) of the evaluation instrument(s), and materials based on the Design phase. End user group needs will be reassessed to ensure that evaluation measures and usability is matched to the desired outcome. Evaluator training and development is provided in this phase to ensure that the entire evaluation team is calibrated to the methodology, instruments, goals and objectives.

Implementation: During implementation, the evaluation is conducted. The goal of the evaluation team's activity is to gather data, document findings, reflections, assumptions and recommendations during the task usability, verification and validation, and performance measurement processes.

Evaluation: This phase consists of the evaluation data analysis and curation, creation of reports, and archival of information. Two reports will be generated from the evaluation process; 1) a "client" findings report, and 2) an After Action Review (AAR) process report as part of the continuous quality improvement plan for the TAG.

The importance of a rigorous approach to evaluating and analyzing current and future military research and development activities cannot be overstated. "The insight gained from undertaking a systematic, unbiased approach to current and future research and development activities is essential to assuring that we are meeting the needs of the military and developing proven solutions" Miller notes.

For more information about the MMSIC TAG, please contact Mr. Geoffrey Miller at: geoffrey.t.miller4.civ@mail.mil.

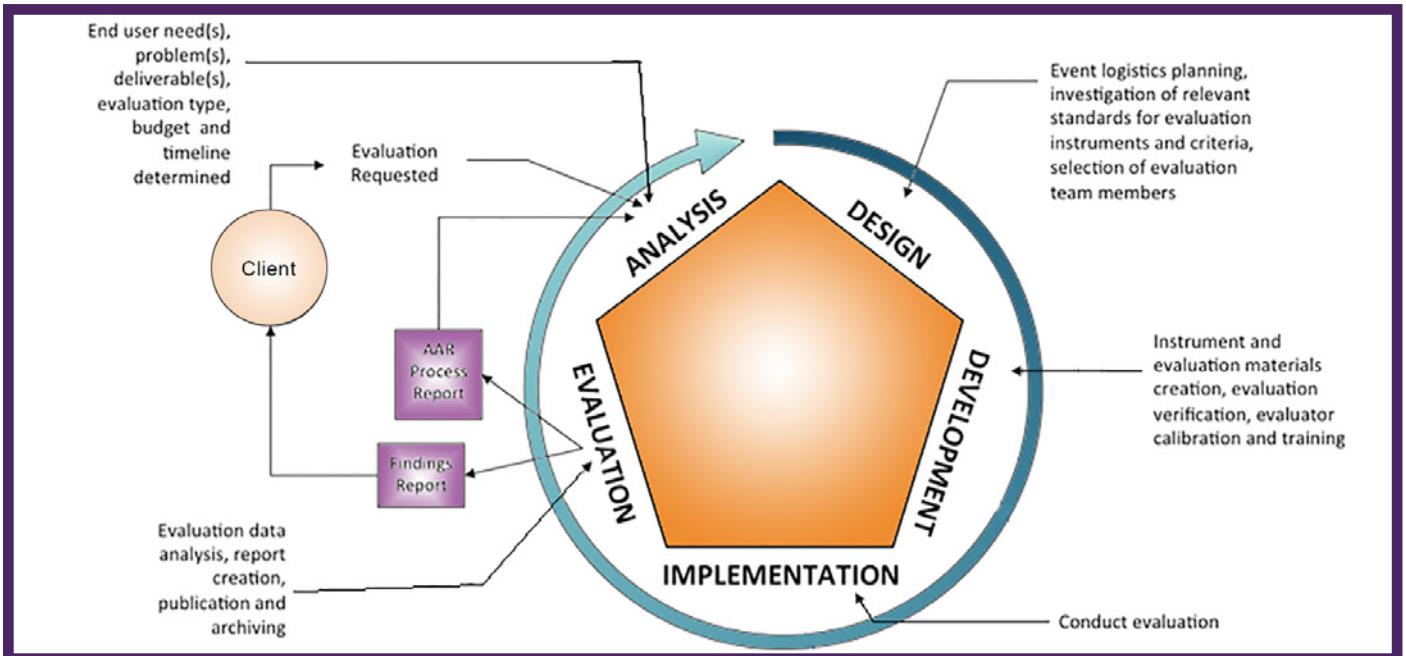


Figure 1. ADDIE Model for TAG Processes

TATRC Research Leaders Participate in Military Health System Research Symposium (MHSRS)

The Department of Defense's premiere scientific meeting, the Military Health System Research Symposium (MHSRS), took place on 15-18 August 2016 in sunny Kissimmee, Florida. The MHSRS is the DoD's only scientific meeting that focuses completely on the Warfighter's unique medical needs. Stimulating, energizing, the MHSRS conference, attended by more than 2,300 participants, was filled with late-breaking information about science, clinical, and technology updates. The MHSRS is sponsored by the Assistant Secretary of Defense for Health Affairs. MHSRS began with a keynote address from Dr. Karen Guice, MD, Principal Deputy Assistant Secretary of Defense for Health Affairs. She addressed the readiness of military medicine and the applicability of research to readiness. Both platform and poster presentations from government, academic, and industry representatives rounded out the program. Plenary presentations were offered each morning, as well as fifty break-out sessions spread through the symposium.

This conference started in the mid-1990s with Army sponsorship and was called the Advanced Technology Applications for Combat Casualty Care (ATACCC) and the TATRC team has always taken an active role. Eleven TATRC representatives participated on behalf of all five of TATRC's major laboratories: Operational Medicine (Op T-med), Mobile Health Innovation Center (mHIC), Health Technology Innovation Center (HTIC), Medical Modeling & Simulation Innovation Center (MMSIC), and the Biotechnology High Performance Computing Software Applications Institute (BHSAI).

Team TATRC(Left to Right) Mr. Harvey Magee, MMSIC Lab, Ms. Jeanette Little, Lab Mgr mHIC, Dr. Francis McVeigh, TATRC Chief Scientist, COL Dan Kral, TATRC Director, Mr. James Beach, Operational Telemedicine Lab.

The TATRC Team was actively involved in the scientific program and presented in numerous breakout sessions, moderated several different panels and delivered various presentations on a multitude of health and technology related topics.

Dr. Fran McVeigh, TATRC's Chief Scientist, and Dr. Amber Linde, Joint Program Committee-1 (JPC-1) Senior Scientist, co-moderated a breakout session entitled "Joint Medical Simulation and Health Information Technology Data Interoperability." Two members of TATRC's mHIC lab in Fort Gordon, Georgia, presented mobile health initiatives. Ms Jeanette Little spoke about "Usability Assessment in Mobile Health Development," and Mr. Ed Kensinger addressed "Secure Wi-Fi Implementation within a Combat Support Hospital."

During the conference session on "Health Information Technology / Informatics," TATRC's Ms. Holly Pavliscsak presented her "Review of Findings for a 9 Month Mobile Health Clinical Research Trial."

TATRC's BHSAI team, represented by Dr. Ginu Unnikrishnan, spoke about "The Effect of Blast Wave on Head Acceleration" in the breakout session on "The Role of Medical Research in Blast Injury Prevention."

Closing out the oral presentations were Mr. Harvey Magee of TATRC's MMSIC team and Dr. Kevin Kunkler, MD, JPC-1, who co-moderated the breakout session on "Medical Modeling & Simulation Team Performance Training."

TATRC also had a prominent presence during the symposium's scientific poster session. From TATRC's Op T-med lab, Mr. James Beach, the newest member to join the Op T-med team, presented two posters authored by Mr. Carl Manemeit and Mr. Nate Fisher. The first was titled "Secure Wireless Architecture for Combat Casualty Care Tactical Cloud", and the second was titled "Autonomous Systems in Support of Future Medical Operations." From TATRC's MMSIC team, Mr. Harvey Magee presented a poster entitled "Results of a User Needs Assessment for the Advanced Modular Manikin Project." Dr. Ginu Unnikrishnan, of TATRC's BHSAI lab, presented

Got a Great Idea? Check out the NEW AAMTI Rapid Innovation Fund

The AMEDD Advanced Medical Technology Initiative also known as the AAMTI program, is rolling out a new opportunity for AMEDD intramural investigators! Starting in fiscal year 2017, military and government civilians who are assigned to an AMEDD facility or activity will be able to submit an AAMTI Rapid Innovation Fund (RIF) proposal for small scale demonstrations of commercial off the shelf (COTS) or government off the shelf (GOTS) technologies. These projects would be evaluated at AMEDD facilities or field exercises. Unlike the traditional AAMTI projects, which are an average duration of eighteen months and cost up to $250,000, the AAMTI RIF's are posed to support projects that are under $35,000 and can be completed in 6 months or less.

This new AAMTI RIF supports the overall AAMTI program, which aims to:

- Demonstrate advanced medical technologies and their impact on cost, access, quality, and safety of care and medical readiness
- Provide senior AMEDD leadership with medical tech-watch capabilities
- Encourage medical technology entrepreneurship by funding MEDCOM technology innovators through a bottom-up (provider/MTF level) approach.

The benefit of the AAMTI RIF program is that it provides for improved timeliness of evaluation reporting and in turn, the necessary piloting to determine if cutting edge technologies should be recommended for further evaluation, or adoption at a larger scale.

AAMTI RIF demonstration projects should provide one or more of the following:

- Provide technologies needed to enhance full spectrum force health protection and readiness
- Reduce the cost of delivering care
- Reduce the time it takes to access care and critical specialty intervention
- Improve the skills and efficiency of care providers
- Improve the quality and safety of care throughout the military health system continuum.

These goals support the program's scope, namely, the identification, exploration, and demonstration of key technologies and enabling biomedical principles required to overcome technological barriers that are medically and militarily unique.

"The new AAMTI RIF provides an excellent opportunity for AMEDD Innovators to recognize a problem and demonstrate technical and expeditious solutions in six months or less," said AAMTI Program Manager, Ms. Holly Pavliscsak.

For more information on the AAMTI RIF, please visit www.tatrc.org. or contact AAMTI Program Manager, Ms. Holly Pavliscsak, 770-529-4103, holly.h.pavliscsak.ctr@mail.mil.

MHSRS *Continued from page 14*

a poster entitled "The Role of Medical Research in Blast Injury Prevention - Effectiveness of Eyewear Against Blast-Induced Eye Injury."

Counting both ATACCC and MHSRS meetings over the years, this has been an investment of almost twenty years of academic rigor. No other event shines a spotlight on combat casualty care like this event… and TATRC's research leaders have, by their leadership, demonstrated vision and action to the "end users" of technologies around the DoD. As always, TATRC listened carefully to hear and understand their needs and requirements, discussed technologies under research and development, and identified opportunities to support the Warfighter for the future.

MMSIC Serves on Capability Developer Team for TC3X Limited User Test

On 1 August, The Army Medical Department (AMEDD) began a high tempo 5-day Limited User Test (LUT) of the Exportable Tactical Combat Casualty Care (TC3X) hosted at the Medical Simulation Training Center (MSTC), in Fort Hood, TX.

So what is the TC3X? It is a "training support capability, to support training of Soldiers to perform medical tasks required by the Soldier's Manual of Common Tasks." The AMEDD is the proponent. The Program Executive Office Simulation Training & Instrumentation (PEOSTRI) is developing the material solution, with funding from the Training and Doctrine Command's (TRADOC) Rapid Equipment Force (REF) program.

The purpose of the LUT was to assess the PEOSTRI contractor's New Equipment Training (NET), and the AMEDD C & S Health Readiness Center of Excellence (HRCoE)'s Training Support Package, as well as the composition of the PEOSTRI's contractor-provided Exportable TC3 Kit, and turnkey capability for Combat Medic Trainers to use the TC3X kit to train Soldiers on medical tasks.

Heading up the event was COL Steven P Middlecamp, Capabilities Development Integration Directorate (CDID), HRCoE, AMEDD. To ensure that end users were represented as the TC3X progresses through the acquisition process, COL Middlecamp formed a Capability Developer Team (CDT). The team will provide operational requirements to the PEOSTRI and assess PEOSTRI solutions. Users are the MSTC personnel and Force Command (FORSCOM) Soldiers.

CDT members are from the AMEDD, the National Simulation Center (NSC), and the US Army Medical Research and Materiel Command's (USAMRMC) Telemedicine and Advanced Technology Research Center (TATRC).

The AMEDD invited TATRC's Medical Modeling & Simulation Innovation Center (MMSIC) team to leverage their capabilities in simulation-based training, from conceiving and conducting innovative research to investigating and evaluating emerging medical simulation technologies and activities. Based on TATRC's conduct of the Scientific Evaluation of the Joint Advanced Modular Manikin in February 2016, COL Middlecamp requested the MMSIC team to participate both in developing / refining survey instruments and the event itself. To gather data during the LUT, pre-surveys, post-surveys and After Action Reports were completed every day. The data was input by the CDT into a Sharepoint site managed by the NSC. Data analysis is being performed by the NSC.

The TC3X LUT also provided an opportunity to evaluate the material developer's proposed training kit and its composition to support Individual Soldier Warrior Task training and HRCoE's training support package, which now would include usage of simulators.

COL Irizarry, Clinical Advisor at PEOSTRI, has been instrumental in developing the TC3X kit. Toward the end of the LUT, COL Irizarry commented that "Combat Medic NCOs conducting Soldier training need to know how to incorporate simulation into their training. The TC3X LUT provided an opportunity to update the training support package to reflect capabilities of the Individual First Aid Kit and the TC3X."

The TC3X training support capability is envisioned to:

- Hone every Soldier's skills to reduce preventable death on the battlefield,
- Enhance realistic casualty training,
- Enhance Commanders' capability both to evaluate Soldier performance on Individual Soldier Warrior Skills and Combat Life Saver tasks and to integrate casualty response in the Mission Essential Task List

Soldier training was conducted at Fort Hood's "Shoothouse." (Left) Combat Medics training Soldiers on the Soldier's Manual of Common Tasks, using the TC3X kit to support the training. (Right)

TC3X *Continued from page 16*

(METL),

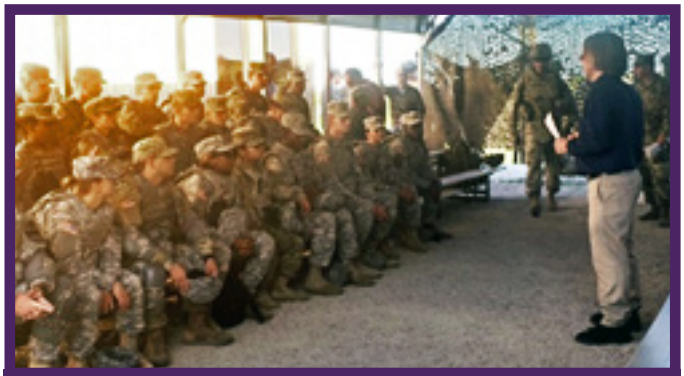
- Facilitate "Soldiers training Soldiers," and
- Leverage the MSTCs to develop trainers.

Mr. Harvey Magee, Technical Director, MMSIC, noted "This is significant because it moves simulation-based training to the first point of care, where Soldiers help Soldiers before a combat medic can even become involved."

FORSCOM Soldier performs tasks

The TC3X equipment package consists of the 1) 6 in 1 Trainer (head and upper torso), 2) Field Expedient Bleeding Simulation System (FEBBS), 3) Rescue Randy, 4) Traumatic Amputation Task Trainer (TATT), 5) Moulage Kit, and 6) Expendables (tourniquets, consumables for mannequins, IFAK, etc.)

This LUT was only the first of a number of user testing events, to provide continuing feedback to the AMEDD C & S and PEOSTRI on the kit, its sustainment, and the training support package necessary to impact fielding. The draft report is in progress with recommended changes to the TC3X kit. Commenting on a successful event, COL Middlecamp stated "The AMEDD is "building the bench" of capabilities to design, conduct, and assess how effectively and efficiently we are training Combat Medics and Soldiers to perform their tasks. I'm glad we leveraged TATRC's expertise in Medical Modeling & Simulation as we do so."



Final After Action Review of FORSCOM Soldier Trainees

mHIC Telehealth 2.0 Project is Awarded

Earlier this summer, TATRC's Mobile Health Innovation Center (mHIC) lab was awarded a multi-year grant for a project entitled, Telehealth 2.0. This is a collaboration between TATRC's mHIC lab, T2 and the Behavioral Health Clinic at Fort Hood, Texas. "The Telehealth 2.0 project is one that is generating a lot of excitement at TATRC, as we explore ways to reach patients for real time telehealth outside of the fixed facility business model" stated Ms. Jeanette Little, mHIC Lab Manager.

This effort will be a demonstration of how behavioral health providers can provide seamless continuity of care to existing active duty service members, even if they are relocated on a temporary basis, such as an extended TDY, at a significant distance away from Fort Hood. Providers will use desktop VTC software in their offices to make connections to their patients, but the patients will connect with their assigned providers by using teleconferencing features on their personal, mobile device. To accomplish the goals of this project, the next generation of Secure Internet Protocol (SIP) based VTC technologies will be used, which are not yet deployed across the Defense Health Agency (DHA). However, the DHA Health IT office has offered their support to this pilot effort, and is working closely with the TATRC mHIC team to establish the SIP based VTC technology infrastructure behind .mil firewalls to ensure that the connections made in this research project mirror the future practices within the DHA. TATRC will then work closely with our research projects to evaluate the reliability, quality and technical considerations of the ability to reach patients outside of fixed facilities with connected health solutions.

AAMTI Project Update from Madigan: Extending the PCMH Dashboard

The Patient Centered Medical Home (PCMH) Dashboard is focused on the PCMH team huddle and patient management. This web based tool provides comprehensive views at the Service, Clinic, Team and Individual Provider level. The PCMH is currently installed in 43 MHS facilities. The problem to be solved is the integration of patient information from non-military facilities. The current PCMH Dashboard does not have access to this information. Therefore it does not achieve the goal of providing a complete longitudinal view of the patient's record. The lack of information from medical sources on the network and the Veterans Administration hinders the clinical decision making process and introduces risk to the patients when information is missing and increases inefficiency as tests or procedures may be done redundantly when no proof exists of them being done previously.

Some of the key accomplishments and lessons learned were that Middleware MobiusHISE (MHISE) was developed to act as a fully functional extension of the e-Health Exchange (EHE). The system was tested and certified to meet all standards and use cases for the EHE. Additionally, a test environment was created with synthesized patient health data and communications through the EHE was confirmed and tested.

This testing has proven that using the standards of the EHE interoperability, is functional through the MHISE Middleware. The medical and military significance of this research requires clinical results. It is understood that this level of near real-time interoperability of patient health information from non-military facilities will provide the benefits of reducing the costs of health care delivery and improve the prioritization of health care delivered.

The next step is upon conclusion of demonstrating the research completed, that the MHISE be put into production and implemented at the Madigan Health Care Facility under the leadership and guidance of the Principal Investigators. During the production, clinical outcomes will be documented. Upon successful production and documentation of clinical outcomes, evaluation of the MHISE would be put into production at all locations using the PCMH. For more information on this AAMTI Funded Project, Please contact AAMTI Program Manager, Ms. Holly Pavliscsak at: *holly.h.pavliscsak.ctr@mail.mil*.

Upcoming Events:

3 - 5 October: AUSA Annual Meeting, Washington, DC

25 - 27 October: AUVSI Unmanned Systems Defense Conference, Arlington, VA

11 November: Veterans Day

12 - 16 November: AMIA Conference, Chicago, IL

14 - 17 November: Cerner Health Conference, Kansas City, MO

28 November - 2 December: I/ITSEC Conference, Orlando, FL

29 November - 4 December: AMSUS, National Harbor, MD

11 - 14 December: PCHA Connected Health Conference, National Harbor, MD

TATRC's HTIC Successfully Collaborates with the National Institute of Standards and Technology

The Health Technology Innovation Center (HTIC) at the Telemedicine and Advanced Technology Research Center (TATRC) recently collaborated with the National Institute of Standards and Technology's (NIST) Usability and Visualization Group along with the Emergency Care Research Institute (ECRI) on the research initiative titled, "Improving Safety Related Usability of Health IT: Evaluating Risk Factors and Safe Use of the 'Copy and Paste' Functionality in Electronic Health Records (EHR)." One particular area of focus regarding EHR safety related usability is the prevalence of the Copy and Paste Function (CPF), and the extent to which CPF does or does not lead to errors that could affect patient safety.

Recently, the ECRI Institute developed The Health IT Safe Practices: Toolkit for The Safe Use of Copy and Paste. The draft toolkit was the result of a private-sector, multi-stakeholder health IT initiative, the Partnership for Health IT Patient Safety that the ECRI Institute convened in 2013 to work on making health IT safer. The resultant toolkit outlines the issues surrounding copy and paste; elucidates recommendations for the safe use of copy and paste; provides educational materials, checklists, references and resources; and suggests implementation strategies for the recommendations provided.

The NIST team in collaboration with the HTIC staff designed, developed and executed an empirical test / validation of the safe practices outlined in the ECRI Institute toolkit with current users of EHR, such as clinical providers. HTIC supported this research with their extensive clinical and technical expertise. The NIST and HTIC researchers defined the experimental protocol in collaboration with ECRI. NIST obtained the Internal Review Board clearance to conduct usability testing with the representative end user clinical population. The HTIC's Early Stage Platform (ESP) successfully provided the testing platform to access an EHR populated with synthetically generated patients with all aspects of a patient's record to include: medications, laboratory and radiology results, and immunizations as well as encounter notes.

The team applied a research method to test how EHR users currently utilize CPF situations in which CPF does and does not lead to errors, and explored ways of mitigating errors either via prevention or correction strategies. In particular, the team examined whether the recommendations outlined in the ECRI Institute toolkit are effective, practical and sufficient methods to minimize errors.

In the course of this research, the team developed an evaluation / interview guide / usability testing protocol; and developed testing and evaluation scenarios that simulated common structures of EHR systems, so as to provide a realistic testing environment. The NIST staff conducted data collection, including the in-depth interviews during the usability testing sessions with clinical providers who currently use EHR in their day-to-day professional activities in order to evaluate this function and features.

Currently, the collected data is being analyzed. The goal is to identify when, where, and how errors may occur, and how these errors may affect patient safety; and whether the ECRI recommendations would improve clinical safety. Findings of the study and its recommendations will inform ongoing standard development processes for Health IT.

Lana Lowry, Ph.D. Usability/Human Factors Lead for Health IT Visualization and Usability Group Information Access Division at NIST stated regarding the collaboration effort with HTIC, "it has been the most remarkable experience to work with you and your team!"

TATRC's HTIC team was pleased to participate in this testing activity to support the development of future standards to ensure patient safety. HTIC's Deputy, Ms. Ollie Gray stated, "We look forward to not only the release of the upcoming report, but also future opportunities to partner with our colleagues at NIST."

Did you Know?...

Much of the early strategic planning and research for Surgical Robotics began at TATRC, which leveraged Congressional special interest funds and other funding sources to support the community of interest that pioneered this ground breaking field.

See link below for more about the Da Vinci Robot @ Landstuhl.

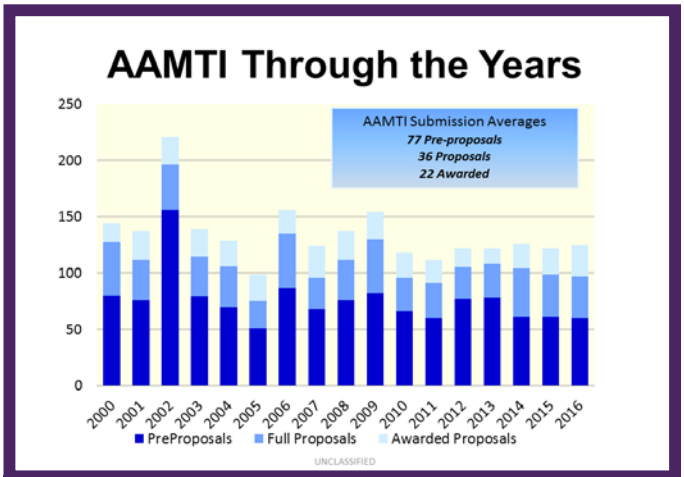
http://www.stripes.com/news/robot-gives-surgeons-a-steady-hand-at-landstuhl-1.427172

AAMTI Awards Announced for FY17:

The U.S. Army Medical Research and Materiel Command's (USAMRMC) mission is to provide solutions to medical problems of importance to the American War Fighter at home and abroad. The AMEDD Advanced Medical Technology Initiative (AAMTI) plays a vital role in the fulfillment of these objectives. Through this program that is managed by TATRC, Army Medical Department leaders have the resources to conduct advanced technology development, demonstration and validation of important new technologies.

The call for proposals for the AAMTI program focused on the following areas for Fiscal Year 2017:

- Demonstration of technologies that improve education for both patients and providers.
- Applications involving the use of cell phones and other ubiquitous technologies to deliver care, monitor patients and/or provide patients with information.
- Explore technologies that support/enable medical care to remote and underserved populations within the AMEDD.
- Evaluate technologies that reduce the administrative burden associated with the provision of care within the AMEDD and support efforts to improve the safety of care and force readiness.
- Investigate Tele-Surgical applications to include real-time surgical consultation from Theatre, telementoring (using Theatre surgeries), consultation and telementoring between and among AMEDD medical facilities and activities.



A breakdown of proposals and awards for the AAMTI since FY 2000

AAMTI Awards are executed by TATRC and funding is transferred to AMEDD organizations that meet the appropriate safety and administrative approvals. Proposals are reviewed through a Two-Tiered Submission Process. Initial Submissions are accepted in the form of a pre-proposal submitted via a secure website accessible from http://www.tatrc.org. Pre-proposals may be submitted by anyone who meets the submission eligibility requirement: the Principal Investigator (PI) must be an AMEDD employee who is employed at an AMEDD facility/activity. A panel of AMEDD personnel representing various AMEDD activities evaluates each pre-proposal. All pre-proposals are evaluated for scientific merit and relevance to military medical programs using the following criteria: innovative concept, military relevance, metrics and potential return on investment (ROI).

Upon review of the pre-proposals by an AMEDD review panel, pre-proposals that merit further exploration are invited for further consideration via the submission of a Full Proposal. Full Proposal submission is by invitation only. The full proposals are also submitted via a secure website accessible from http://www.tatrc.org. Full Proposals are evaluated for consistency and resolution of issues from the pre-proposal phase by a panel of AMEDD personnel. Awards are dependent upon adequate demonstration by the applicant that they have fully addressed all administrative and programmatic considerations.

This year, the AAMTI program received sev-

AAMTI Proposal Team, Holly Pavliscsak & Sharon Garlena, hard at work preparing incoming proposals for evaluation and award.

TEAM TATRC Presents and Participates at 2016 DHITS Conference

The 2016 Defense Health Information Technology Symposium (DHITS) was held at the Caribe Royale Convention Center in Orlando, Florida, 2-4 August. DHITS brought together a broad spectrum of participants from the Military Health System (MHS), the Defense Health Agency (DHA) and Military Services' Health IT community. The symposium provided a platform to interact and discuss strategic changes, the concept of shared services, DHA initiatives, and information on the launch of MHS GENESIS.

This multi-day event included DHA-wide plenary sessions, service specific general sessions, and break out presentations on a number of IT related topics, ranging from the roll out of the new electronic health record – MHS Genesis to Cyber Security practices. TATRC Director, COL Daniel Kral presented at two breakout sessions entitled: "Providing Telehealth Services and Improving Access to Care Using HIT." Kral said, "just like all military assets, information technology (IT) must be planned with the future, not the past, in mind." He was joined by Public Health Service Cmdr. William Satterfield, telehealth/telementoring program officer for the Defense Health Agency's Clinical Support Division, and Andrew Jacobs with the agency's Health IT Investment Branch.

Additionally, Ms. Jeanette Little, TATRC's mHIC Lab Manager presented at two breakout sessions entitled: "Mobilizing the Enterprise: The Future of mHealth in the MHS." Little stated, "This event was a key opportunity for members of the TATRC team to directly interface and engage with IT experts on issues related to current and future technology operations within the military healthcare system."

TATRC was also featured in a video display highlighting all five of TATRC's intramural laboratories and programs in DHA's booth in the main exhibit hall.

TATRC's Director, COL Dan Kral, briefs DHA Leadership, Col Chip Terry and Mr. Guy Kiyokawa at our Exhibit Hall booth during DHITS16.

HTIC Lab Manager, Ms. Levine, explains how HTIC develops solutions to address gaps in military medicine.

AAMTI *Continued from page 20*

enty pre-proposals. Pre-proposals were then reviewed by seventeen different evaluators with diverse expertise from across the AMEDD. Thirty-five new investigators submitted AAMTI's for the first time this year. Of the seventy pre-proposals submitted, 61% (43) were invited for full proposal submission. Eight full proposal reviewers evaluated and scored the full proposals and then met to rank order the potential awardee list.

Upon review by TATRC leadership, 22 of the forty three invited full proposals have been awarded Defense Health Program Operations & Maintenance funding from the FY17 AAMTI program.

Ms. Holly Pavliscsak would like to thank all of the AAMTI submitters to this year's AAMTI program, as well as the reviewers for their time and expertise. If you would like more information on submitting an AAMTI pre-proposal in the future, please contact AAMTI PM: Ms. Holly Pavliscsak, at: holly.h.pavliscsak.ctr@mail.mil, 770-529-4103.

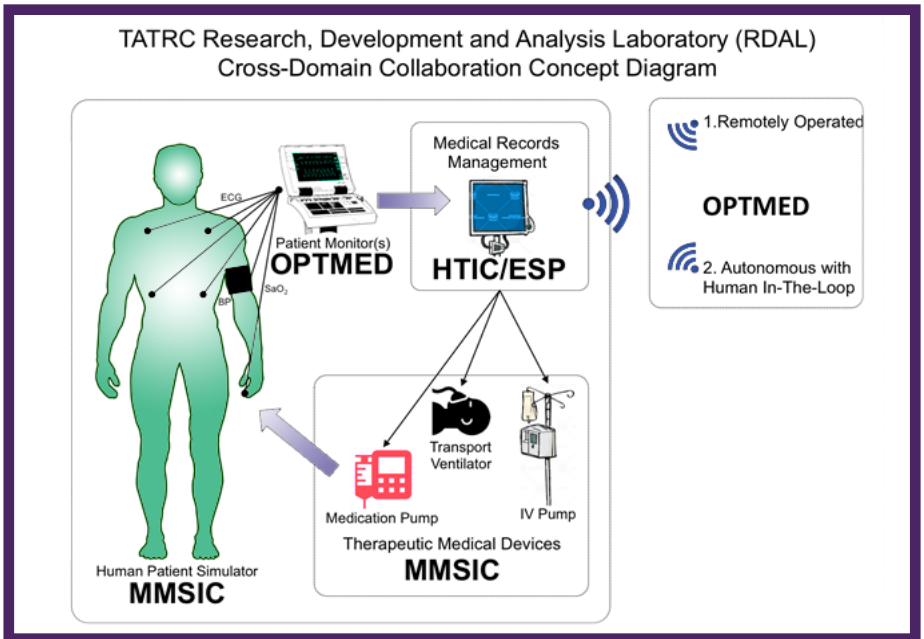
TATRC Paves the Way Towards Optimizing its Simulated Field Environment

TATRC is building a new capacity and capability within its Prototype, Integration & Testing Lab (PITLAB) facility this fall, known as the Research, Development and Analysis Laboratory (RDAL). Following this year's successful TATRC Open House, a proposal was submitted to TATRC leadership, by the Medical Modeling and Simulation Innovation Center (MMSIC) to develop a permanent laboratory on site to replicate the Role 1 and 2 environments. This new capability is intended to support the widest possible range of TATRC research efforts, providing a comprehensive testing ground for past, current and future research efforts, encouraging cross-domain and laboratory collaboration.

Building and expanding on the existing tent space at TATRC, the lab area will add another 800 square feet, bringing the new total space to 2400 square feet. The lab will consist of two simulation spaces, and areas for pre-briefings and after action review. The laboratory will also be outfitted with an audio-visual system to allow for video recording and archiving as well as the capability to create immersive virtual environments, sounds and other realistic environmental characteristics. In the future, the lab hopes to be able to add the ability to even produce additional environmental features such as smoke, smells, and other combat related conditions.

The laboratory will add 2-full bodied computer-driven human patient simulators, capable of simulating a wide array of medical conditions and injuries. The simulators can be used for testing and experimentation of current and future technologies, procedures and interventions for military health needs. The lab will also provide a variety of partial task trainers. The laboratory will be furnished and fitted with equipment sets for combat medics and the majority of Role 1 and 2 care needs. This area will also have an operational telemedicine lab, accredited medical information center, allowing for testing of prototype secure communication and data devices. These capabilities can further be integrated to allow for multi-lab concepts testing and systems modeling and simulation, to evaluate research efforts across the entire casualty care spectrum.

With all of these new capabilities, the lab will provide new and enhanced opportunities for TATRC's research and development activities, specifically, the ability to perform early-stage testing of research programs, the ability to conduct comprehensive evaluation and analysis of funded research efforts, and promotion of integrated, collaborative research and development activities both intramural and extramural, across multiple labs. "This investment represents an exciting opportunity for the labs at TATRC to work together bridging our research efforts in a simulated military environment. We will soon have the ability to research, experiment and test from the casualty and through the entire telemedicine environment," stated Geoffrey Miller, MMSIC Lab Manager and Research Scientist.



Sample Concept for Cross-Domain / Laboratory Research

TATRC Supports the ATARC Federal Cloud Computing Summit

The Advanced Technology Academic Research Center (ATARC) sponsored the Bi-Annual Federal Cloud Computing Summit at the Marriot Metro Center, in Washington, DC on 26 July. The one-day summit was supported by a variety of Federal agencies including the Department of Defense, Department of Veterans Affairs, Office of Management and Budget, Department of Agriculture, and others.

The ATARC is a 501(c)(3) non-profit organization that provides a collaborative forum for Federal government, academia and industry to resolve emerging technology challenges.

ATARC introduces innovative technologies and ideas from academic research labs to the Federal government and private industry.

Opening remarks and introductions to keynote speakers were provided by Dr. Lauren Thompson, Director, Department of Defense/Veterans Affairs Interagency Program Office (DoD/VA IPO).

The summit was broken down into two main forums; a morning and afternoon forum, with five separate breakout sessions. In the morning, the key topic areas discussed were how Federal CIO, Tony Scott released a draft memo on the Data Center Optimization Initiative (DCOI), which requires agencies to develop and report on data center strategies to consolidate inefficient infrastructure, optimize existing facilities, achieve cost savings, and transition to more efficient infrastructure, such as cloud services and interagency shared services. The panel explored Data Center Optimization and examined how Federal agencies are working to meet the DCOI mandate. Also discussed was how the Federal government continues to develop Cloud capabilities. Selected government organizations discussed how they are utilizing Cloud technology and services to better accomplish their mission through their Cloud success stories, and the available tools, services, and utilities that provided greater efficiency with their agencies. The afternoon session was broken down into five breakout sessions that covered the following five topics:

1. DevOps vs. NoOps Managing Public Clouds
2. Secure Cloud Access: from APIs to Mobile & IoT Devices
3. Workload Management for Cost Savings
4. Cloud Category Management
5. Cloud Computing in Healthcare

Representatives from the DoD/VA IPO requested TATRC's presence at the Summit to serve as subject matter experts in advanced technology and Operational Telemedicine in Theater.

Mr. Thomas R. Bigott, of TATRC's Operational Telemedicine Lab and Project Manager for Medical Cloud Computing for Combat Casualty Care (MC5) research and development project, participated in the afternoon breakout session where four major questions were asked of the participants concerning Cloud Computing in Healthcare. Mr. Bigott expounded on the research and development Cloud Computing work taking place to support the capture, transmission, and data collection of casualty medical information from the point of injury, while enroute to advanced tactical medical care, and at the tactical medical treatment facilities.

Mr. Bigott later stated, "The ATARC Federal Cloud Computing Summit provided an excellent opportunity for TATRC to understand the breadth, complexity, and standardization of the Federal Government moving toward Cloud Computing. In addition, it provided like-minded staff from a multitude of Government organizations, the opportunity to meet with each other to discuss their concerns, questions, and thoughts on Cloud Computing."

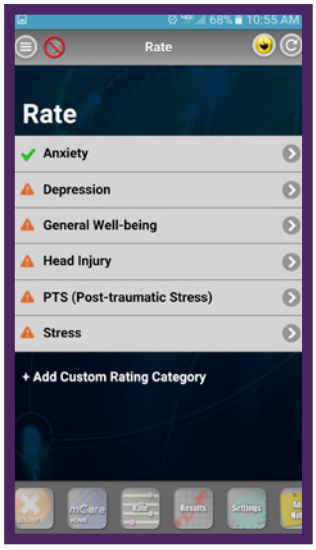
Photo Courtesy of ATARC
The morning forum at the Bi-Annual Federal Cloud Computing Summit on 26 July 2016

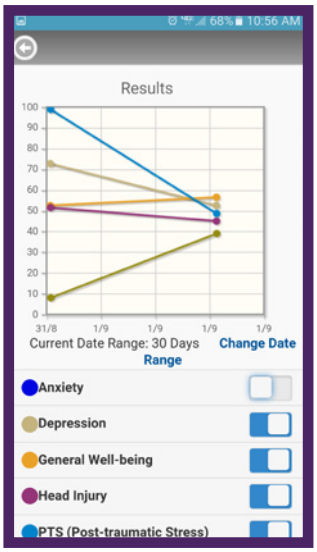
MHCE-R System Now Includes T2 Mood Tracker Functions

The popular T2 mobile app, Mood Tracker, has now been successfully integrated into the TATRC-hosted Mobile Health Care Environment Research (MHCE-R) System. This project was a collaboration between the TATRC mHIC team and T2, and provides a means to do secure, bi-directional communication and tracking of Service members and other patients using the Mood Tracker mobile app features and their assigned behavioral health providers. T2 Mood Tracker is a mobile application that allows users to monitor and track emotional health. Originally developed as a tool for service members to easily record and review their behavior changes, particularly after combat deployments, it has now become very popular with many civilian users around the world. The app records a range of emotions for anxiety, depression, head injury, stress, posttraumatic stress and a user's general well-being. Users can also create items to track their progress in unique areas.

The features of the Mood Tracker app have been seamlessly integrated into the MHCE-R system's secure mobile app, mCare, and allow validated users to input feedback on 10 standard scales, and any custom rating scales they create within the mCare application. Additionally, the input the mobile user provides is shared with their assigned providers through a secure web portal interface to the MHCE-R system. This will allow the T2 team to evaluate how mobile users interact with the Mood Tracker features over time, and also assess how this tool can be used in a dynamic way to connect patients and providers between clinical encounters. TATRC's mHIC lab manager, Jeanette Little stated, "Working in collaboration with our peers at T2 has been a pleasure, and we hope this Mood Tracker project is the first of many opportunities to partner in ways that bring out both organizations' strengths as a value-added effort."

This project was funded by a grant from the AAMTI program, and is the first of several joint collaborations between the TATRC mHIC team and T2.





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