TATRC TIMES
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Team TATRC Makes Fitness a Priority!

In keeping with the Surgeon General's Performance Triad Initiative, many TATRC staff members are "walking the line" and striving to meet their daily activity goals. The Performance Triad focuses on Sleep, Activity and Nutrition and key actions that go into each of those spaces. One primary area that Team TATRC is focusing on is Activity. The Triad Initiative calls out 10,000 steps as a goal for people to try to reach. Here at TATRC, we are aiming for excellence in Activity. Several have even turned it into a group activity.

Kati Weaver and Courtney Kentrus of TATRC's Resource Management Office out walking and staying on track checking their fitness devices.

For most of us, if the alarm clock goes off at 3:45 am, it's a mistake. But that is not the case for Ms. Esmilda "Angie" Hill, one of TATRC's hard working administrative assistants who supports the Mobile Health innovation Center (mHIC) lab based at Fort Gordon, GA. Four to five times a week, Angie ensures that she is awake well before 4:00 am so she can dedicate up to 90 minutes of her day to physical activity before she reports to work.

Angie prefers to hit the track and clock six miles each morning. During the winter months, it's not uncommon for her to don 3 layers of clothing just to ensure she can keep her exercise routine outdoors. But on the days when the weather doesn't allow her to be outside, she maintains her personal commitment to exercise and moves to the gym.

Back at Headquarters, in Fort Detrick, MD, Mr. Greg Dempsey, TATRC's Chief Financial Officer keeps his activity routine steady. Mr. Dempsey walks every day, rain or shine, for his thirty-minute Lunch Break, in an effort to get his steps in.

A great way to "stay on track" with fitness goals is to exercise with friends and co-workers. Courtney Kentrus and Kati Weaver from the Resource Management team stop and take a brisk two minute walk outside around the building several times throughout the day to increase their active minutes. Ms. Betty Levine, Health Technology Information Center (HTIC) Lab Manager and Mr. Bob Connors, along with Mr. Robert Chewning, also walk around the TATRC building a

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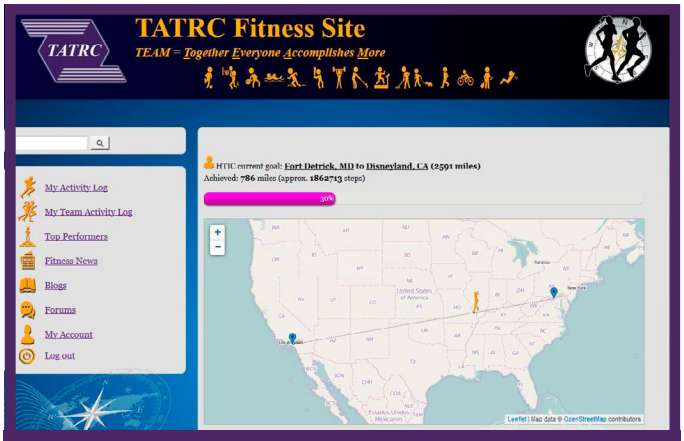
Ms. Angie Hill putting her best foot forward.

couple times a week together, encouraging each other to keep up on their fitness goals and take seated meetings out of the conference room and to the great outdoors.

Another way the TATRC team stays motivated, is by utilizing the TATRC Fitness Tracker, developed by TATRC's HTIC lab. The TATRC Fitness Tracker is a web-based prototype that demonstrates an interactive team approach and application to support the Performance Triad Initiative. This site can track and monitor fitness both on the individual level and at the group level. Currently, Ms. Levine and Mr. Joe Barrick, TATRC's Logistician have set a team challenge to walk the equivalent distance from Fort Detrick, Maryland to Disneyland in CA. So far they have completed 786 miles, (approx. 1,862,713 steps) about 30% of their goal. Not only can the TATRC team track their progress in their cross-country walk, but there are also opportunities on the site to share motivational articles on fitness, nutrition and sleep as well as blogs. This motivates not just individuals, but the teams working towards their goals as well!

Making fitness a personal priority isn't a novelty for the TATRC staff. For example, Mrs. Hill started working out in this fashion in 1995 when she noticed that she was experiencing lower back issues on days she did not get regular exercise. Once she began a regular exercise regimen, her lower back issues disappeared. But she's also experienced other benefits; she's more relaxed, has a natural stress reliever, and has noticed an improvement in sleep and energy levels. Ms. Hill said, "I try very hard to give my best, do my best, look my best and be at my best every day and in every way. Therefore, I have a holistic health care approach to life. Fitness at its best enables me to always be my best!"



Screen Shot of TATRC Fitness Tracker developed by HTIC programming staff.

TATRC Director, COL Dan Kral is leading the way in the adoption of standing desks to help improve over all fitness in the work place.

Many members of the TATRC staff have noticed similar results in their personal fitness routines. These improvements not only encourage their own personal commitment, but have served as an inspiration to other members of the staff to get up and get moving. This not only takes the form of getting outside and walking or hitting the gym, they are changing their daily work habits by starting to use standing desks for day-to-day work. Leading by example, TATRC Director, COL Dan Kral, utilizes his standing desk for several hours each day. He has been a staunch supporter in getting the rest of the TATRC team "on their feet." New research has come out stating that sitting for extended periods of time can increase your risk of heart disease and other medical problems. By using this alternate work station, the TATRC team is working to help reduce the risk of obesity, Type 2 Diabetes, other metabolic problems, as well as cardiovascular disease.

Together, Team TATRC is committed to improving overall health and making fitness a priority!

Diabetic Mobile Health Research Study - A Project Update

The TATRC mHIC team is hard at work on advancing the technology for a Diabetic Mobile Health Research study that will be conducted in partnership with the Patient Centered Medical Home and Clemson University. The research project is funded by Joint Program Committee - 1 (JPC-1). Recently, the selection of the equipment sets that will be used for home based monitoring in the patients' homes was finalized. Each patient who will participate in the research arm study will receive a glucometer, blood pressure monitor, weight scale and activity/sleep tracker that will synchronize data with the secure mCare application on their personal mobile devices, and will be monitored through the backend portal by case managers at Madigan Army Medical Center at Joint Base Lewis McCord and Mike O'Callaghan Federal Medical Center at Nellis Air Force Base. The home monitoring devices that will be used during this study include: My Glucohealth Glucometer, A&D Blood Pressure monitor, A&D weight scale and the Fitbit Charge. Information from these devices will be displayed in a secure mobile app on the patient's personal mobile phone and/or tablet, and will also be accessible to their assigned case managers through a secure portal interface at the clinical facilities. The features of the mobile and portal interfaces are under development now, and will be leveraged in an Institutional Review Board approved clinical trial. The outcomes of this clinical trial will help shape remote home monitoring Telehealth options for the Military Health System in the future.

Mrs. Jeanette Little, mHIC Lab Director stated, "The Diabetic Mobile Health Research study has the potential to be a landmark effort for the industry. Home monitoring devices are very popular within the industry, but there remains a paucity of information about the impact these technologies will have on patient activation and outcomes without clinical trials."

Pictured above are various types of connected devices that can be used to monitor diabetic physiology.

Holly Pavliscsak Named as AAMTI Program Manager Successor

Newly Appointed AAMTI Program Manager, Ms. Holly Pavliscsak

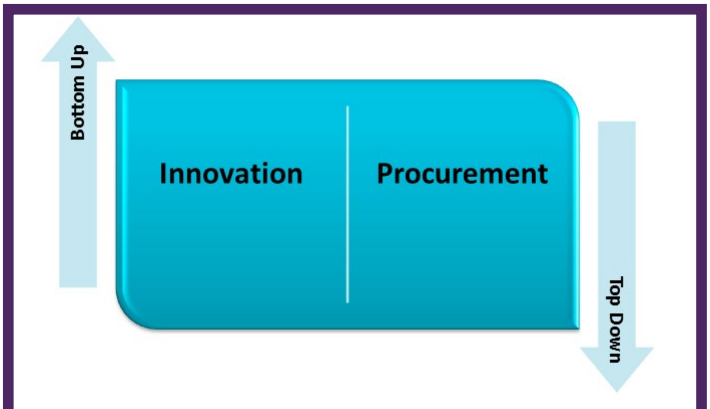
TATRC is very pleased to turn the reins of the AMEDD Advanced Medical Technology Initiative (AAMTI) program over to Ms. Holly Pavliscsak. Holly has 20 years of military medical research experience specifically focused on innovative technology implementations from concept development to publication. She previously served as a Research Project Manager at TATRC where she developed a mobile health platform known as Mobile Health Care Environment (MHCE) and its accompanying bi-directional secure mobile application, mCare. This program won one of the Army's Greatest Invention Awards in 2010. Ms. Pavliscsak also won the Rufus G. Sessions Award for Excellence in Mobile Health in 2011. She holds a Bachelor of Science degree from Georgia Southern University (1995) and a Master of Health Services Administration degree from Armstrong Atlantic University (1999). She has been awarded over 30 AAMTIs, in conjunction with Principal Investigators across many different medical specialties and who sought to implement innovative technologies such as Telemedicine, mHealth within the Military Health System. She has tremendous working knowledge of the AAMTI program and will be an invaluable resource moving forward. Holly will be supported by Ms. Sharon Garlena who will continue to serve in her role as the primary Project Officer for the AAMTI. For any questions relating to the AAMTI, please contact Holly directly, at: holly.h.pavliscsak.ctr@mail.mil or 770-529-4103. Congratulations, Holly!

Committed to Innovation:
The AMEDD Advanced Medical Technology Initiative (AAMTI)

"The enterprise that does not innovate, ages and declines, and in a period of rapid change such as the present, the decline will be fast." - Peter Drucker, Renowned Management Theorist

The Army Medical Command (MEDCOM) has many unique missions that differentiate it from the civilian medical sector such as, rapid mobilization of military medical personnel, providing emergency care on the battlefield, and providing rehabilitation to Soldiers recovering from multiple, devastating injuries. When the requirements of providing retiree and beneficiary care are added to the Soldier-specific medical mission, a daunting undertaking becomes almost herculean. The imperative to meet military mission requirements while providing quality care to Soldiers, retirees, and beneficiaries demands the demonstration and adoption of innovative solutions. As the intersection of technology and medicine broadens at ever-increasing speed, a nimble and focused method of identifying and demonstrating technologies and their impact on cost, access, quality, and safety of care (and medical readiness) becomes imperative.

The Army Surgeon General, through the Telemedicine and Advanced Technology Research Center (TATRC) provides a special Defense Health Program, Operations and Maintenance (DHP O&M) appropriation to enable technology proofs of concept/demonstrations throughout the MEDCOM. TATRC created the AAMTI to solicit and fund these projects. The fundamental goals of the AAMTI are: to demonstrate medical technologies and their impact on cost, access, quality, and safety of care, and medical readiness; to provide senior MEDCOM leadership with medical tech-watch capabilities; and, to encourage medical technology entrepreneurship by funding MEDCOM technology innovators through a bottom-up (provider/Medical Treatment Facility level) approach. 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 "Bottom-Up" approach-funding MEDCOM technology innovators to inform important "Top-Down" acquisition decisions.

AAMTI projects demonstrate primarily Commercial off the Shelf and emerging technologies and systems, some of which evolved from projects funded through Congressional Special Interest, Small Business Innovative Research, Defense Health Program, core medical research programs, and other DoD and Government sources. These small-scale proofs of concept and technology demonstrations can augment existing, larger investments, or provide data to support future technology/systems development planning and investment. The modestly-priced projects (<$250K) offer the potential of a high return on investment (ROI) particularly when compared to larger, more expensive Research Development Test and Evaluation (RDT&E) hypothesis-driven research projects. Being an Intramural program, AAMTI projects enable the Enterprise to control for environment, study design, metrics identification, reporting criteria, etc. The bulk of AAMTI projects require partnering with industry and/or academia, but the relationship is driven by a "pull" from the Enterprise, rather than a "push" from industry/academia (as is the case with Broad Agency Announcements, Program Announcements, and other RDT&E award mechanisms where the government is, in essence, purchasing a proposal, with limited shaping capabilities). Analysis of AAMTI project data against the cost, access, quality, safety of care, and medical readiness metrics often results in identification of the underlying clinical, business, and cultural practices that retard adoption and/or use of new technologies, systems, and protocols. Ultimately, AAMTI proofs of concept/demonstrations can inform important acquisition decisions by providing input from disparate stakeholders and end-users in Army medical facilities and environments. The results of AAMTI demonstration projects are

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expected to either directly result in, or support, efforts to:

A) Provide technologies needed to enhance full spectrum force health protection and readiness;
B) Reduce the cost of delivering care;
C) Reduce the time it takes to access care and critical specialty intervention;
D) Improve the skills and efficiency of care providers; and
E) Improve the quality and safety of care throughout the TRICARE healthcare continuum.

The AAMTI is an annual program with a two-tiered submission (pre-proposal and full proposal) and evaluation process; it is open to Army Medical Department (AMEDD) personnel only. Collaboration with industry, academia and other military services is permitted and encouraged, however the submitter must be employed in the AMEDD and the funding must go to an AMEDD facility or command for execution. Pre-proposals are submitted via a secure TATRC web site. Pre-proposals may be submitted by any AMEDD employee (one who is employed at, or through, an AMEDD facility/activity) who is Active Duty, Government Civilian, or IPA. Full proposal submission is by invitation only.

Through its "bottom-up" approach to technology demonstration, the AAMTI reaches out to those on the front lines of Army medicine to identify and demonstrate technologies and systems that support and advance the Surgeon General's vision while informing important acquisition decisions.

The FY17 AAMTI pre-proposal submissions system opened on 7 January 2016 and will remain open until 10 May 2016, the submission system and detailed program documentation can be found at www.tatrc.org. For more information, please contact the AAMTI Program Manager, Ms. Holly Pavliscsak (holly.h.pavliscsak.ctr@mail.mil, 770-529-4103).

TATRC Team Member Recognized by HIMSS Society for 2015 mHealth Summit Presentation

On November 9, 2015, Ms. Holly Pavliscsak, presented at the 2015 mHealth Summit conference, in the Population Health track. Her presentation was entitled *Utilizing Mobile Messaging for Rehabilitation Support* and presented very detailed data and strategies for long term patient engagement with mobile health applications and systems.

In January 2016, the Healthcare Information Management Systems Society (HIMSS), who served as the conference sponsor of the mHealth Summit, informed the TATRC team that Ms. Pavliscsak's presentation received the highest evaluation scores of all speakers at the conference. We are very proud of Holly's hard work and commitment to advancing best practices in mobile health, and are pleased to see that her peers in the industry have singled her out for recognition of her contributions to groundbreaking research findings.

TATRC's AAMTI Program Manager, Ms. Holly Pavliscsak, presenting her talk on the use of mobile messaging in rehabilitation.

TATRC Partners with Marine Corps Warfighting Laboratory for RIMPAC 2016

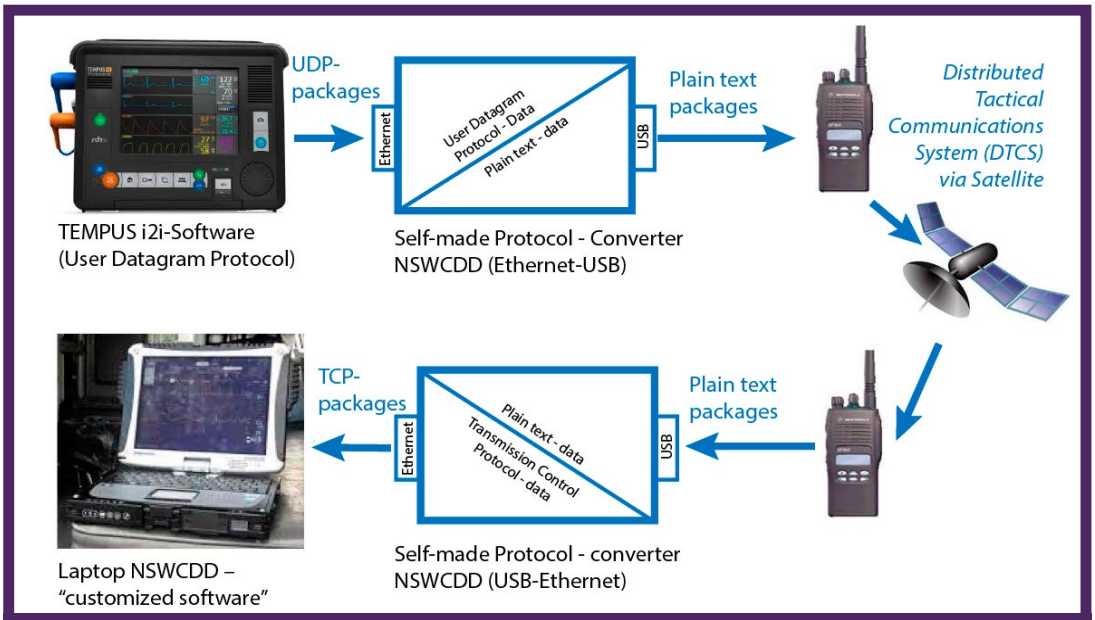
The Operational Telemedicine Lab of the Telemedicine and Advanced Technology Research Center (TATRC) is partnering with the Marine Corps Warfighting Laboratory (MCWL) for the exercise known as "Rim of the Pacific" (RIMPAC) 2016 in Southern California to experiment with the concept of medical situational awareness.

RIMPAC is the world's largest international maritime warfare exercise with units conducting operations in both Hawaii and Southern California. During RIMPAC, MCWL will conduct a concept based experiment, referred to as the Marine Air Ground Task Force (MAGTF) Integrated Experiment 1-2016 (MIX 1-16), in the Southern California region. MIX 1-16 will focus on the employment of Company Landing Teams in urban terrain as envisioned by the Marine Corps capstone concept Expeditionary Force 21 (EF-21). Special attention will be given during the experiment to questions and concerns surrounding combat casualty care. MCWL will insert a forward surgical unit, a maneuvering shock trauma squad, and a shock trauma squad operating within an aircraft. Units will be distributed between Camp Pendleton and 29 Palms.

In support of MCWL, TATRC is providing six (6) Tempus Pro physiological monitors. These monitors will be integrated into the Navy's experimental Distributed Tactical Communications System (DTCS) and the organic sea-based operational 117G/ANW2c. This will allow forward resuscitative care teams, on the ground and in aircraft, to transmit vital signs and other medical data over tactical communication systems to higher echelons of care to ensure situational awareness, to gain assistance, and to prepare for the arrival of casualties. MCWL describes this concept and tool as the "Medical Common Operating Picture." The hope is that the tool will one day provide both the Commander and Medical officers with the real-time locations of medical units, patients' status during transit, the status of medical supplies (to include blood), a medical regulating tool, and disease tracking.

"Without the support of TATRC, our medical objectives for MIX 1-16 would not be possible," said LCDR David Gribben, USN, Branch Head of Expeditionary Medicine at MCWL. He went on to say, "This goes beyond material support. In TATRC, we have a true Joint partner in the development of future medical concepts and technologies." The goal for TATRC and MCWL is to continue this valued partnership over the next three years with the integration of the ultra-wide band medical sensors and other En Route Care wireless medical capabilities, as well as capturing and transmitting electronic point of care medical data with DTCS & integrating the medical data into the Tactical Cloud, and with an electronic TC3 card that can go into the casualty's permanent Electronic Health Record.

Joint collaborative cooperation, experimentation, and development between TATRC and MCWL is essential to the success of future Joint Operations. Through leveraging partnerships and innovations, the Army and Marine Corps can ensure that they are ready to provide the best possible care for the casualties of future wars.



Remote Patient Monitoring Concept

From the desk of TATRC's Chief Scientist...

TATRC Creates yet another Memorandum of Agreement (MOA)—But Why?

by Francis L. McVeigh, Chief Scientist,
TATRC, USAMRMC

Before I answer the question, 'Why create yet another MOA?,' I would like to discuss the MOA's definition and purpose as they relate to TATRC's current mission.

IAW, Wikipedia, March 2015, 'A Memorandum of Agreement (MOA), also known as a memorandum of understanding, is a formal business document used to outline an agreement made between two separate entities, groups or individuals. This MOA may be used to cooperatively work together on an agreed upon purpose, or meet an agreed objective and outline the discussed terms of a new relationship. The purpose of an MOA is to have a written understanding of the agreement between the parties. An MOA usually precedes a more detailed contract or agreement, after a process of negotiations and due diligence.

More clearly stated by Robert L. Charles, JD, LLM, MPH, Chief, Medical Research Law, Office of the Staff Judge Advocate, US Army Medical Research and Materiel Command (USAMRMC) Fort Detrick, MD, "… different agencies have a different understanding of when a particular document should be denoted as an MOA rather than an MOU. When we (USAMRMC) are working or collaborating with another agency, we are willing to have that document denoted as whatever the other agency might wish or insist upon, either MOA or MOU. From a legal standpoint, we really don't care. For arrangements entirely within DoD, my understanding has always been that under an MOA, the parties are offering up or committing certain resources to each other, or toward a common end, under agreement. On the other hand, under an MOU, the parties come to a general understanding, usually of having a common interest in some area (e.g., treatment of infectious diseases), but no funds or other resources are committed to any particular action (except perhaps, e.g., the parties agree to meet every so often to discuss the common interest; however, if they want to commit resources, then another type agreement will be entered, like a CRADA or MOA.). This is how I interpret DoDI 4000.19, which concerns specifically Support Agreements to which at least one of the parties belongs to DoD."

TATRC has interpreted the MOA and MOU purposes as Mr. Charles stated above. To date, TATRC has finalized a MOA with the PEO-Joint Chemical/Biological and the Medical Communications for Combat Casualty Care (MC4) Program Offices and is in the process of finalizing MOAs with PEO-Defense Healthcare Management Systems (DHMS) and others.

Dr. Francis McVeigh, TATRC's Chief Scientist

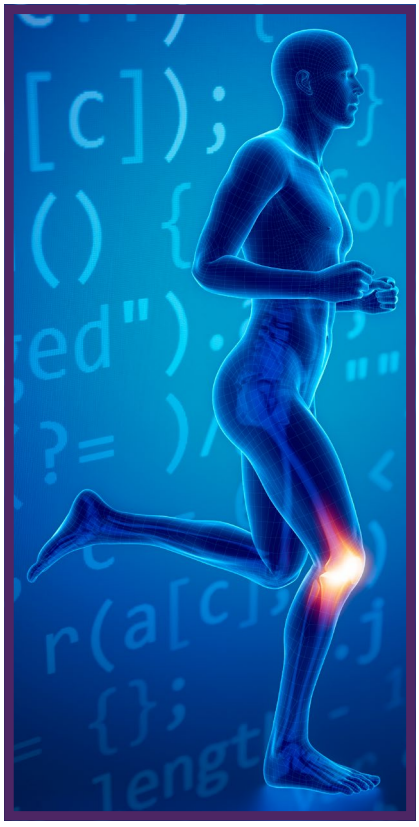
So, to answer the question why do we create MOAs? A short answer is: We create a MOA to formally acknowledge in writing that a level of trust and willingness to work with each other exists between organizations. Furthermore, MOAs delineate each organization's capabilities, and their focused areas of concern. Inherent in the agreed upon MOA is the belief of both parties that the supporting organization possesses the capabilities and right people skill sets required to address the other organization's areas of concern. Additionally, as stated above, the MOA, unlike an MOU, identifies the ability and ways to provide reimbursement for efforts expended. It takes months to create and gain concurrence on a MOA. Therefore, another major benefit of having an MOA is that work efforts can continue uninterrupted and delays or stoppage will be avoided when specific individuals within an organization change as your agreement is with the organization and it remains in place irrespective of personnel changes.

Lastly, TATRC has an obligation to transition its research products to Program Offices. Establishing MOAs with Program Offices enhances the likelihood that research ideas and efforts are focused from the beginning on the Program Offices' identified needs and gaps. This early on synchronization with Program Offices increases the likelihood that research products will transition to Program Offices; hopefully get into the hands of our Soldiers, and other service members; and ultimately avoid the Research Valley of Death.

Algorithms Prove Paramount in Mobile Health

One of the foundations of successful implementation and adoption of any mobile health project includes well thought out algorithms for information flow between patients and providers. The TATRC Mobile Health Innovation Center (mHIC) team has an experienced staff of mobile health subject matter experts that guide partners through the process of outlining information flows to ensure that protocols and processes are established prior to application development. Currently, the TATRC mHIC team is working on an AMEDD Advanced Medical Technology Initiative funded project for post traumatic osteoarthritis in conjunction with the University of North Carolina and Keller Army Community Hospital, West Point, NY on developing communication algorithms. Dr. Ken Cameron, Director of Orthopaedic Research at Keller is the Principal Investigator for this effort.

These algorithms include outlining when to query patients, accessing educational content titration, quantifying patient response, determining parameters that trigger a provider alert and connection to the backend provider interface. Long term, this thoughtful process is designed to ensure patients and providers get an appropriate stream of information that keeps them engaged in the mobile health application but doesn't overwhelm them with unnecessary information. This application will allow for the education of service members young and old, on the importance of knee health, avoidance of injury with proper technique and assessment of risk factors.



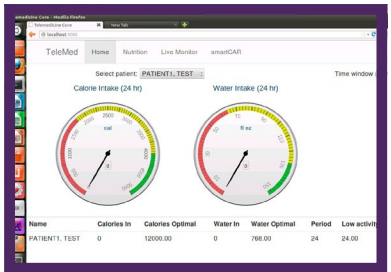
Medication Integration into the mCare/Mobile Health Care Environment

Medications are the most cost effective therapy available to our patient population. That being said, the mechanics of providing these medications to our beneficiaries can be challenging. In order to demonstrate improvements in the distribution process as well as provide MHS patients with valuable information concerning their medications, TATRC mHIC is working with MAJ Todd Schwartz, the Principle Investigator for this AAMTI funded project, as well as COL Keith Wagner, to determine what information and functionality can be incorporated into a secure mobile device to optimize their Pharmacy experience. This partnership brings together experts from Madigan Army Medical Center, Dwight David Eisenhower Army Medical Center, as well as expertise from private industry.

A few of the areas that we are looking to improve are the medication refill request process, as well as an up-to-date pharmacy profile that lists all of the current medications a patient is taking via secure mobile technologies. An additional functionality of value, will be to have information available that would typically be found on the medication information sheets that you receive with your prescription. Patient compliance with their prescribed medications is a key component to their long term health, and TATRC is pleased to have an opportunity to contribute to this effort.

The Value of Sleep, Nutrition and Hydration Monitoring During Far Forward Missions

A Captain Aero Medic with 18 years' experience as a PA said the following about Sleep, Nutrition and Hydration, "If water is an issue then my guys get headaches and faint. If nutrition is an issue then the mission could be over before they have a serious energy loss. If sleep deprivation occurs, then I see poor thinking, increased risk taking and sometimes the beginning of paranoia. If all three of these are an issue and not just one, then the mission is at risk and long-term health problems may also have their initial beginnings. They are all interrelated. Sometimes the location can mitigate the seriousness. We can filter water, and kill something to eat. But sleep is a 'get it when you can' type of issue. We can take stimulants, but there is a down side to too much of that."



Realtime Monitoring of Sleep, Nutrition, and Hydration: Health Dashboard

This Tiad of health components is also a focus of the Army Surgeon General. The TATRC Operational Telemedicine Lab has just finished a three year project that addressed this Triad called the Smart Project.

The Smart Project evolved over three years into a system of systems and prototyped a Health Dashboard that monitored Soldier Activity, Nutrition and Hydration. NetWarrior applications for the End User Device (EUD) (Smart Phone) were developed and integrated into a communications network that could be displayed on a remote Army server that was monitored by leadership and the health care provider. A system for theater operations, or humanitarian relief requires good communication networks, operation in limited infrastructure environments and limited resources of equipment and supplies. The three year project addressed all issues of a health care theater network and gaining soldier acceptance. The three years were broken up into the capabilities of Connectivity, Sensors and Alerts.

The first year of the project focused on Connectivity. The goal was to find a way for the medics, soldiers and leadership to communicate with each other while on the move. TATRC collaborated with CERDEC on range extending capability of the NetWarrior phone and downloading Medic mission software from a prototype that CERDEC developed for the Army App Store. We were successfully able to integrate the EUD, Army radios and mobile transport vehicles to include HUMVEEs, and a flight helicopter. With the comms issue solved, we were ready to focus on getting the data off the soldier.

The second year of the project was spent focusing on sensor integration and the use of a Zephyr interface. With a prototype dashboard, this was where we began to look at the Triad components.

The third year we were able to successfully demonstrate Triad monitoring on the Health Dashboard. The EUD became a primary focus to see what the Medics thought of the system. All soldier surveys indicated a positive value of the capability. As we expected, the issues during a real deployment are the sensor size, and the additional hardware/software load the soldier would have to carry. The EUD's and its cellular system is clearly the way forward to address Triad monitoring.

The EUD development achieved the use of "Pushed" alerts to leadership, ease of use and acceptance by the soldier, connectivity between commands and diverse technologies. Additionally, the EUD had software installed that educated and provided direction as the sensor information comes into the system. The EUD can include the soldiers' Ranger Medic Handbook as a guide for taking action on poor Triad performance. Customer direction can be provided quickly, cheaply and efficiently by the medic in the field to meet changing environment and/or supplies issues. These changes can then be dynamically "Pushed" to leadership for information or action. Lastly, the system was integrated with the Medical Communications for Combat Casualty Care (MC4) card to get the information into the soldiers Electronic Medical Record.

The path forward could be to move the dashboard to the EUD instead of a remote Army server. Additionally, sensor technology needs to be automated while delivering a constant stream of information that is automatically monitored, and when necessary, alerts pushed to the health care provider and team leadership. We have determined that soldier self-reporting is a challenge and the soldier sometimes feels it is not in their best interest. So a wearable sensor that is integrated into the EUD and thus the Army comms network, would be an optimum capability. We were able to look at commercial off-the-shelf based wrist monitors and determined that one could be integrated with the Smart system. This is a key finding and requirement of the ability of the sensor to integrate with the Army EUD and cellular network. The Army has numerous requirements that are centric to deployed (Far Forward) missions that need to be met. As of this article, no hydration sensor is available.

Our research from this project demonstrates that these capabilities will be of value in Far Forward missions and across all continuums of care.

Mr. Winston Goes to Washington after 16+ Years at TATRC

Mr. John Winston, Former AAMTI Project Manager

After sixteen great, exciting, rewarding and productive years at TATRC, Mr. John Winston has decided to move on to a brand new chapter! Mr. John Winston, the Program Manager for the AMEDD Advanced Medical Technology Initiative (AAMTI), has accepted a position with American Defense International (ADI), a well-known and respected government consulting firm in Washington, DC. He will be the new VP for Health and Life Sciences Programs. He will be working with commercial and academic clients, helping them with business and funding strategies, to include opportunities in the DoD (primarily medical). His last official day at TATRC was Friday, 12 February 2016.

This is a great opportunity for Mr. Winston, but in talking with him, it's bittersweet as he leaves TATRC and MRMC. Mr. Winston wanted to personally address all the friends and colleagues he has made during his tenure to thank each of them. "After 16+ great years at TATRC, I have decided to move on to a new challenge. I leave TATRC with a heavy heart, as I have made so many friends whom I respect and admire. I want to thank all of you for your willingness to work with me and the AAMTI program, for your counsel, your passion, and mostly, for your friendship. The AAMTI has been my most meaningful achievement at TATRC. Through the AAMTI, I have had the privilege to meet and work with the very best in military medicine. The AAMTI has afforded me the opportunity to engage with innovators and leaders from all corners of the Military Health System, and it has cast in sharp relief the commitment to selfless service each of you make every day. It has been an honor and a blessing to know you, to support you, and to learn from you, and all of you will be in my thoughts and prayers as you move forward in your careers."

In his new role, he hopes to be able to keep abreast of advances in technology and government developments and wanted everyone to know that he will always value the opportunity to assist the Army Medical Department.

Thank you, John Winston, and good luck in all your future endeavors! Your TATRC family will miss you.

TATRC mHIC Team Member Recognized for 10 years of Civilian Service

On January 29, 2016, COL Daniel Kral recognized Richard "Rick" Wise from the TATRC mHIC office at Fort Gordon for ten years of civilian service to TATRC as a Network/System Administrator. Rick is a hardworking, committed member of the TATRC team, who is well deserving of acknowledgement and recognition for his dedicated service.

Employee Spotlight

TATRC Welcomes Military Science Officer!

MAJ Ian Dews, TATRC's Chief Science Officer

MAJ Ian Dews, Ph.D, comes to us from Joint Program Committee – 6 (JPC-6). While at JPC - 6 he served as COL Todd Rasmussen's Military Deputy and did a 7 month deployment to Afghanistan in 2012. Now that he is here at TATRC, he will serve as the Chief Science Officer, working closely with Dr. Francis McVeigh, TATRC's Chief Scientist, as well as all five of the TATRC Lab Managers, and will serve as a "bridge" between TATRC and each of the JPCs! He holds a Ph.D from Rice University in BioChemistry and is eager to dive in! MAJ Dews officially arrived in December 2015 and is our second official "Green suiter!" He is a big Motorcycler and loves his Harley! He lives in Frederick with his wife and 4 children, who range in ages from 10 months to 18 years, so he is a busy Dad!! WELCOME MAJ DEWS! \\\

TATRC Welcomes New Help Desk Technician Matt Goff and Computer Programmer Dean Parrish

Mr. Matt Goff, Help Desk Technician

Mr. Matthew (Matt) Goff, joins us a "help desk technician" working here at Fort Detrick on site 100% of the time at TATRC HQ. His time is split down the middle, working specifically in support of TATRC's mHIC initiatives and Ms. Jeanette Little's team in Fort Gordon, GA, as well as spending half his time supporting the HTIC lab and the ESP initiatives, so he is dual hatted. He is a contractor with the Geneva Foundation & Vanesco. Matt lives in Germantown, MD with his wife and young daughter and his hobbies include hiking and camping. Welcome aboard Matt! \\\

Mr. Dean Parrish, Computer Programmer, mHIC Lab

Ronnie "Dean" Parrish joined the TATRC mHIC team at Fort Gordon in early December 2015. He is a computer programmer and will be working with both the mobile interface and backend secure portal features for the Mobile Health Care Environment (MHCE) system. Dean is a graduate of Augusta Technical College, and has 3 years of professional experience in computer programming, which included both client-side and server side language. Mr. Parrish is a lifelong local resident of the greater Augusta area, and enjoys drinking good coffee, watching sports, and travelling when he can. Welcome to the team, Dean! \\\

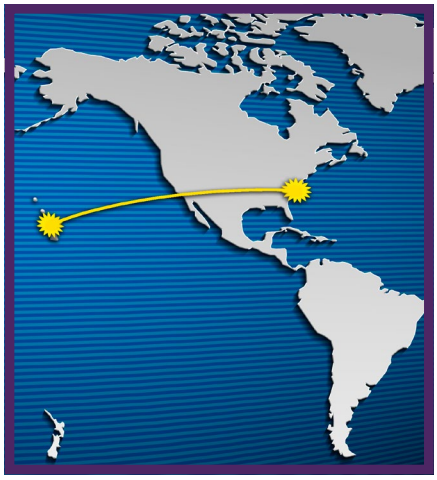
TATRC mHIC Team Contributes to the JET Mobile S & T Roadmap Efforts

The Department of Defense (DoD) and Veterans Affairs (VA) have established a Joint Exploratory Team (JET) to address a Mobile Security and Transport (S&T) roadmap. Currently there are numerous mobile S&T efforts, pilots, and lab activities being executed with lessons learned that benefit both DoD and VA; however, there has been minimal sharing of lab resources and outcomes across the Departments. The goal of this interagency team is to help bridge those gaps.

mHIC Lab Director, Ms. Jeanette Little stated: "TATRC's expertise in mobile security and transport, along with the lessons learned from the Mobile Health Care Environment (MHCE) system and mCare secure mobile app, is something we are happy to share with other government agencies." Because of this experience that the TATRC mHIC team has with mobile security via the MHCE system and its secure app, mCare, the JET team has reached out to collect the lessons learned from TATRC pilot projects and research studies. To date, TATRC has participated in the kick-off meeting on 14 January 2016, and has also participated in a formal, initial interview about the MHCE/mCare experience.

Early Stage Platform Establishes Direct Connection with PJITC

The TATRC Health Technology Innovation Center (HTIC) is focused on carrying out research on emerging health information technologies that can support improved health access, availability, acceptability, continuity, cost-effectiveness, and quality, typically at the Military Health System (MHS) Garrison or role 4 in the continuum of care. TATRC HTIC researches new ways to acquire, access, and analyze data, store, and retrieve it, and make data mobile, secure, and interoperable, for exchange with other health systems.



After months of hard work, TATRC's HTIC along with the Pacific Joint Information Technology Center (PJITC) established a secure, high-performing connection between TATRC's Early Stage Platform (ESP), a virtualized development, integration, and test lab, and the MHS test computerized physician order entry and electronic health record systems at the PJITC. HTIC provided the PJITC with fully synthetic patient records in 2015. These synthetic records are totally made-up and do not include anonymized or de-identified data. They are longitudinal and clinically relevant. As previously reported, the synthetic patient records were ingested into the test Composite Health Care System, and the AHLTA Clinical Data Repository (CDR). The connection between the TATRC HTIC will directly support HTIC's research and development initiatives to access the current legacy systems in support of Defense Healthcare Management Systems transition activities. While the MHS has acquired a new Electronic Health Records, this connection from the ESP to the legacy systems, will allow not only academic organizations, but also commercial vendors to work with TATRC to access an EHR for developmental testing purposes. TATRC looks forward to using this first connection to the PJITC as a model to connect to other government sandboxes.

This Quarter's TATRC TRIVIA...

How many Directors have led the TATRC organization since its inception in 1993?

Stay tuned for the answer in our next issue!

Early Stage Platform to Launch FHIR Proving Grounds for Joint MHS/VA Exploratory Team

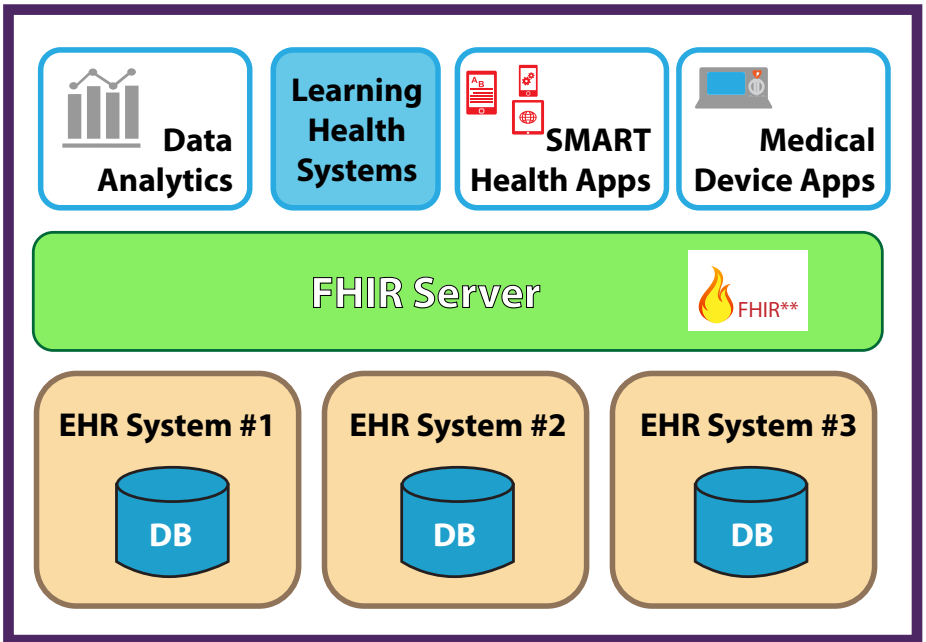
The Health Technology Innovation Center (HTIC) at TATRC is working with the Integrated Program Office (IPO) to establish a Fast Healthcare Interoperability Resources (FHIR) Test Proving Ground. This work will support the Joint Exploratory Team (JET) as they explore the use of the FHIR standard for the Military Health System (MHS) and the Veterans Health Administration (VHA). A FHIR server will be in place within a project zone in the HTIC's Early Stage Platform (ESP). Approved users will access the server to test use cases to support the MHS and VHA.

FHIR is the latest standard created by the Health Level Seven International (HL7) organization. FHIR standard combines HL7's existing v2, v3 and Clinical Document Architecture (CDA) standards with a main focus of facilitating interoperation between legacy health care systems. Its aim is to make it easy and seamless to provide health care information to health care providers and individuals on a wide variety of devices from computers to tablets to cell phones.

FHIR standard provides an alternative to document-centric approaches such as the CDA by directly exposing discrete data elements and allowing information to be exchanged through a set of modular components called Resources. Examples of Resources are Patient, Allergies, Medications, CarePlans, Family History, etc.

FHIR is easier to implement due to its ability to leverage the latest web standards thru the consistent use of a modern web-based suite of Application Programming Interface (API) technology:

- HTTP/HTTPS-based RESTful protocol,
- HTML and Cascading Style Sheets for user interface integration,
- JSON or XML for data representation,
- OAuth for authorization and
- ATOM for results.



Examples of FHIR-based Systems

Basic elements of healthcare like patients, admissions, diagnostic reports and medications can each be retrieved and manipulated via their own resource URLs.

All that is required to build a FHIR Server is a web server on the front end and access to the proprietary databases on the back-end to translate from the proprietary formats of respective EHR systems to a form that can then be packaged as FHIR Resources.

With its two key building blocks, a set of simple but flexible clinical data models and developer friendly REST APIs, FHIR can be utilized to quickly and directly expose discrete data elements as services to facilitate the development and deployment of systems that focus on the health of individuals. This is an important part of any future healthcare ecosystems such as Learning Health Systems. Besides data transparency, the format of FHIR's data structures are optimized for analysis allowing data to be easily sliced and diced for analytics.

Ms. Ollie Gray, HTIC Program Manager stated, "The HTIC is excited to host this prototype proving ground for the IPO JET to lay the initial ground work to achieve interoperability using the emerging FHIR standard."

MMSIC Team Completes First Ever Evaluation of Advanced Modular Manikin, Phase 1

In the spring of 2015, the TATRC's Medical Modeling & Simulation Innovation Center (MMSIC) was assigned a new mission: to provide independent assessments and evaluations of maturing training technologies identified as critical and relevant to improvements in medical training effectiveness. These include, but are not limited to, modeling, simulation, training, performance enhancement and skills retention. The initial customer is the Joint Provisional Project Office for Medical Modeling & Simulation (JPO-MMS). Assessment and evaluation services may become available more broadly.

The first project requested for evaluation was the Advanced Modular Manikin (AMM), Phase 1 Research and Development (R&D). Perhaps you have heard about some kind of "new manikin" project, an "advanced" platform or training system so advanced that it can accommodate "both current and future peripherals", such as a range of procedural heads, necks, arms, hands, legs, and skins, that have not even been developed yet! It's true! That futuristic concept, the AMM, is for joint services training. The AMM is envisioned to be an agile technology platform that allows optimal configuration of almost any kind of manikin for any training purpose. The initial prototype will be a general purpose manikin. Eventual purchasers can configure future AMM manikins and devices to suit their specific needs.

The AMM was conceived in 2013 by the TATRC "MedSim" team and the Joint Program Committee-1 (JPC-1), Medical Training and Information Sciences. The concept was driven by training gaps, such as flexible training systems customizable to specific curricula and objectives, standardized architecture supporting plug and play of training scenarios, head-to-toe untethered training systems transportable via various military transports, capability to support hand-offs among military medical teams, and an interoperable training platform to support both combat casualty care and fixed facility training.

The AMM research vision resulted from an "opportunity-driven" R&D model. It drew on dozens of years of military and industry experience of being "close to the customer". Customers include, but are not limited to, educators, trainers, and managers supporting Combat Casualty Care or "fixed facility" training missions. Dr. Thomas Talbot (University of Southern California, Institute for Creative Technologies), Chief Scientist for the MMSIC under contract, is recognized as the conceptual architect of the AMM. Dr. Talbot had this to say as he reminisced about the long hours of concept thinking, "the Advanced Modular Manikin is one of many groundbreaking initiatives I've been fortunate to be involved with at TATRC. The AMM evaluation we just completed is a fitting capstone to my seven year period at TATRC."

The Request for Proposal (RFP) for the AMM was posted by the US Army's Medical Research Acquisition Agency in June 2013 and identified desired capabilities. The funding source is the Defense Medical Research & Development Program, and programmatic responsibility is that of the JPC-1. In September 2014, based on the recommendation by a selection review committee of the proposals submitted, research contracts were awarded to four (4) organizations. Dr. Kevin Kunkler, Portfolio Manager for the JPC-1 Medical Simulation and Information Sciences Research Program, Medical Simulation and Training, noted "JPC-1 works diligently to address clinical and functional gaps, needs, and requirements, when identified, and to best identify technologies that may align to close identified gaps in training capabilities. We understood that the AMM is an aggressive and ambitious goal. However, we realized that such advancements were needed to address the different and severe injuries that the military healthcare providers encounter to deliver safe and high quality care under extreme conditions to the dedicated men and women in the DoD and for humanitarian care."

Shortly after the RFP was announced, but in an unrelated action, the Director of Research and Development Policy & Oversight OSD (Health Affairs) chartered a Capabilities Based Assessment (CBA) for "Combat Casualty Care Training Technologies (C3TT)". Two "deliverables" were released 28 May 2015: 1) draft Joint Doctrine, Organization, Training, Materiel, Leadership and Education, Personnel, Facilities and Policy Change Recommendation (DCR), and 2) draft Initial Capabilities Document (ICD).

The JPO-MMS expressed interest in the AMM as a candidate for transition into the Military Health System (MHS). Anticipating potential acquisition, COL Daniel Kral, TATRC Director, charged TATRC's MMSIC team to accomplish three critical tasks, to: 1) conduct a User Needs Assessment (UNA), 2) develop a Concept of Operations (CONOPS), and 3) facilitate a Scientific Evaluation of Phase I results.

The TATRC's MMSIC planned and conducted the UNA in the spring of 2015. A 10-section, mixed methods survey instrument, based on the stated technical and functional capabilities in the AMM RFP, was designed, developed and distributed to a group of eighty-nine Subject Matter Experts (SME). The

MMSIC *Continued on page 16*

Pictured above are the collaborative contributors to the Joint Service AMM Workgroup.

You're Invited to

TATRC's

Open House & Technology Demonstration

"Supporting Military Readiness through Innovative Technologies"

Who: Thought Leaders & Collaborative Partners in Military Medicine

What: An informal Open House to highlight & feature TATRC's ongoing research & managed programs. Guests will be able to see & experience our technologies & engage in open dialogue with the research leads.

Why: To provide broad awareness of TATRC's core competency areas & current research portfolios & to highlight TATRC's unique capabilities firsthand.

When: Friday, 6 May 2016
*Open Anytime from 10:00 am - 3:00 pm

Where: TATRC Bldg. 1054, Patchel St. & PITLAB

RSVP: Advanced Registration is required NLT: Friday, 22 April 2016, via e-mail to: anna.k.hagarman2.ctr@mail.mil or lori.a.debernardis.ctr@mail.mil

MMSIC *Continued from page 14*

SMEs represented the active and influential Medical Modeling and Simulation (MM&S) advisory groups in the MHS, such as instruction and training, training program management, research and development, and acquisition program management. Thirty-nine were judged complete for evaluation and analysis, a 44% rate of return.

Key findings and major themes were identified, affirming the need for an AMM technology as described in the RFP. A detailed evaluation and analysis was provided in the Main Body of the UNA, which was approved on 13 August 2015. Drawing on his 20 years of experience as an educator and leader of several simulation centers, MMSIC's Research Scientist, Mr. Geoff Miller, noted as he thought of the AMM's potential impact: "The concept of developing a truly 'universal, interoperable human-patient simulation platform' has the potential to revolutionize medical modeling and simulation. Common standards, open-source architecture and a focus on interoperability will allow future innovation to be crowd-sourced, accelerating new ideas, modules, peripherals and interfaces in and far beyond the current standard, meeting the ever increasing demands of not only the MHS, but the larger medical and healthcare education, patient care, and research communities."

To ensure end user input, the MMSIC team convened a Joint Services AMM CONOPS Workgroup, 17-18 December 2015, Fort Sam Houston, Texas. Approximately 40 SMEs participated. Mr. Miller, assisted by Ms. Rebecca Lee, project officer, employed a Nominal Group Technique, which generated, recorded, clarified, and ranked concepts identified. The MMSIC team has completed the final draft Joint Services AMM CONOPS. As of this writing, it is under review.

A formal Peer Review Scientific Evaluation of Phase I was facilitated by the MMSIC team on-site at TATRC's Prototype and Integration and Testing Laboratory (PITLAB), Fort Detrick, MD, 1-5 February 2016. The MMSIC developed the technical and educational evaluation instruments and hand-selected educational and technical evaluators, all SMEs in the field. Formal presentations and interactive live demonstrations were given by the awardees. The overwhelming response of government participants was that the AMM evaluation was successful. Formal reports were written, to assist the Government as it determines whether to invest in a Phase II effort to develop a "training prototype".

The long-term goal is to obtain the DoD's first-ever interoperable, standardized manikin-based training platform. Harvey Magee, MMSIC Lab Manager, noted "The AMM initiative is a monumental undertaking. Many agencies have key roles: JPC-1, the Congressionally Directed Medical Research Program, TATRC, and JPO-MMS. It is not the place of the R&D community to force technology on the users. The AMM is only a technology to deliver a capability to support the trainers. It is the DoD's dedicated trainers, with many and varied missions at all levels of care, who conduct the training!"

On a fee-for-service basis, the TATRC MMSIC is now maturing its plan and processes to offer their assessment and evaluation services to other organizations.

TATRC Shines at IMSH 2016!

For more than ten years, the TATRC "MedSim" team has played a major role in the success of the International Meeting for Simulation in Healthcare (IMSH). So what is the IMSH anyway? The IMSH is the annual meeting of the Society for Simulation in Healthcare (SSiH). Driven by a growing national mandate to improve patient safety, the IMSH reflects the emergence over the last two decades of Medical Modeling & Simulation (MM&S) as an entirely new professional field. The IMSH conference is the premiere main educational event for government, industry and academia. SSiH also publishes a peer-reviewed journal (Simulation in Healthcare) and manages the Certified Healthcare Simulation Educators program for medical simulation educators.

In 2016, several TATRC leaders participated in the IMSH meeting. TATRC Director, COL Daniel Kral, Dr. Fran McVeigh, Chief Scientist, MAJ Ian Dews, Science Officer, Mr. Harvey Magee, Lab Manager, TATRC's Medical Modeling & Simulation Innovation Center (MMSIC), Mr. Geoff Miller, MMSIC's Senior Research Scientist, and Dr. Thomas Talbot, MD, MMSIC Chief Scientist were all in attendance and active participants. Approximately forty other key Army personnel were in attendance for the 15-20 Jan 2016 meeting, of the more than 2,500 attendees from 56 countries around the world. There were more than thirty Preconference and Immersive Sessions, 325 education sessions delivered by over 750 faculty leaders. The 'Hall of Discovery', which is the world's largest Medical Simulation exhibition, featured 98 exhibitors for healthcare simulation professionals, many of which were collaborative research partners.

A simulated RPG Explodes at the Mass Casualty Exercise Scenario

Participation in the IMSH conference advanced the Army's mission by expanding and updating our understanding of state of the art training techniques, and allowing us to interact with simulation leaders from all over the world. The MEDCOM's

IMSH *Continued on page 17*

IMSH *Continued from page 16*

mission includes providing safe, high quality care — as effectively and as efficiently as possible — to its military, dependent and retirees. One key is effective training. This includes education and training "from the foxhole to the operating room," from first responders and combat medics, to Spec Ops medics through fixed facility Graduate Medical Education programs, including physicians, nurses, ancillary providers, and health care administrators as well. It is critical that Military Health System (MHS) healthcare providers remain educated and informed of the latest teaching and training strategies, and management and operation of Medical Simulation Centers. Educational sessions added extreme value to Army attendees in many tracks such as: assessment and outcomes, certification, instructional methods, leadership, learning theory, program administration, research and development, and technical operations.

MMSIC Lab Manager, Harvey Magee, served as the DoD's lead coordinator for the DoD Exhibit Area

Prior to the opening plenary session at IMSH, there were several intensive "Immersive Training Scenarios" conducted at the Strategic Operations Inc. "Shoothouse" in San Diego, CA. MMSIC's Senior Research Scientist, Mr. Geoffrey Miller, was one of a number of volunteer faculty members who planned and facilitated this exciting event.

TATRC's MMSIC and JPC-1 team developed and co-moderated, more than twelve riveting presentations in the DoD academic program session ranging from current research initiatives and projects such as Skills Decay, Biogears, Conversational Virtual Patients and Simulated Human Tissue Characterizations to forward looking strategic vision.

Dr. Thomas Talbot addresses "Virtual Standardized Patient"

TATRC's MMSIC also planned and coordinated the "DoD Interactive Exhibit Area" which featured none maturing R&D prototypes. This provided an effective venue for mutual exchange of information between the research teams and conference attendees, to provide early feedback to the Principal Investigators and their investigative teams, which improves research outcomes. This provided Army attendees a better understanding of what is "in the pipeline" of DoD-funded research and development to help them select "best of breed" approaches to training.

As the use of simulation-based education and training becomes more prevalent in the MHS, other DoD agencies are demonstrating leadership roles as well. Several other special events took place for DoD attendees, to include a DoD Medical Simulation Affinity group meeting, and a DoD Medical Simulation orientation meeting at the Naval Medical Center San Diego.

Approximately 100 DoD personnel attended the DoD Medical Affinity group meeting, which was co-chaired by Dr. Joseph Lopreiato, Director, Val G. Hemming Medical Simulation Center, USUHS, and CDR Typhanie Kinder, Chair, US Navy Central Simulation Committee. Dr. Lopreiato informed the group of the "Healthcare Modeling & Simulation Certificate" program (https://movesinstitute.org/healthcare), which is a collaborative venture of the MOVES Institute and the Uniformed Service University of the Health Sciences. The certificate program is a four-course, distance-learning certificate program to provide healthcare simulation center directors, staff, users and supporters with state-of-the-art theory and practice of healthcare modeling and simulation. TATRC's own Harvey Magee, MMSIC Lab Manager, is a graduate of the inaugural class in 2013.

On 20 Jan 2016, approximately 100 DoD attendees met at the Naval Medical Center San Diego. More than a dozen DoD agencies briefed their simulation-based training missions. Now that simulation-based education and training has been identified as a primary method of training in the MHS, DoD agencies need to understand "Who's Doing What" to work effectively and supportively. Because the IMSH meeting was in San Diego, this was an excellent opportunity for overviews of service-specific medical simulation programs. The Navy's Surface Warfare Medical Institute Simulation Center, Naval Hospital Simulation Center and the commercial Strategic Operations Hyper-realistic Training Center were highlighted. Tours of these facilities provided a service-specific aspect of the requirements necessary to simulate training for Navy medical personnel to perform patient care on land or 'aboard ship'.

So was it worth it? Unanimously, the Army attendees said "Yes! Let's definitely do this again!" Mr. Harvey Magee stated, "The IMSH is a tremendous and unique opportunity for TATRC to communicate with simulation leaders on new research and technology trends at the world's largest conference on simulation healthcare. This one of a kind training event provides opportunities not offered anywhere else in the DoD."

Mr. Geoff Miller Presenting on Autonomous Mentoring Systems.

Mobile Integration of 'Fit for Performance'

The TATRC mHIC team is working directly with Principal Investigator, COL Joanna Reagan, of the Health Promotion and Wellness Portfolio at the Army Public Health Center to incorporate the 'Fit for Performance' educational modules on nutrition, activity and mindset into a secure mobile health application. This TATRC AMEDD Advanced Medical Technology Initiative (AAMTI) funded effort will incorporate the principals of "Get Nutrition Ready", "Get Physically Fit", and "Get Mind Fit".

This unique application is designed to provide a dietician coach to patients directly through a mobile application on their personal phone. Patients will be able to receive the validated content provided by Fit for Performance, as well as, personal messaging and direct coaching from their personal dietician. Remarkably, patients will be able to take a picture of their meal and submit it through the security of the mobile application to their dietician for analysis and recommendations for modifications. This application will allow dieticians unprecedented access to patients between face-to-face encounters, greatly increasing the likelihood of success of each patients individualized treatment plan.

More information about Army Nutrition programs can be found on the Army Public Health Center website: https://phc.amedd.army.mil/topics/healthyliving/n/Pages/default.aspx

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lori.a.debernardis.ctr@mail.mil

On the Horizon...

Upcoming Events:

7 - 9 April: MMVR Conference; Los Angeles, CA

6 May: TATRC's Spring Open House & Technology Demonstration, Fort Detrick MD

14 - 17 May: ATA 2016: Annual Conference & Trade Show, Minneapolis, MN

23 - 26 May: 2016 SOMA Annual Meeting, Charlotte, NC