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Features

COL Ronald T. Stephens
Commander
Womack Army Medical Center
Fort Bragg, NC

Commander’s Corner

Tactical Ambulatory Evolution
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By Regena Kowitz

Developing Healthcare Professionals and Optimizing Readiness
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Q&A with COL Evan Renz, Commander, BAMC

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By Kevin Hunter

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Cover: Medics of “Task Force Tropic” prepare to load a casualty on to a UH-60 during a casualty evacuation drill. (Photo by Sgt. 1st Class Walter Van Ochten)
In the decade and a half since U.S. troop deployments to Afghanistan, the defense industry has made tremendous strides in the medical arena. The marriage of combat action and medicine has produced a myriad of advancements helping enable servicemembers to get necessary survival care on the battlefield. Technological progress in research centers and even bringing the medical tools of the military to first responders in civilian scenarios has produced a cross pollination of increased capabilities across the civil and defense sectors. Above all, special attention has been paid to increased preparation and training for combat medics and personnel deployed to global hot spots in an increasingly-volatile world.

In the Winter 2015/16 issue of Combat & Casualty Care, we tackle the ever-evolving topic of tactical medicine and lessons learned in recent years of combat wound care which continue to change training application DoD-wide. From targeted tactics in mock field first response to surgical techniques for enhancing short- and long-term outcomes, Joint DoD centers of learning such as the Defense Medical Readiness Training Institute, Camp Bullis, TX, and the Naval Health Research Center, San Diego, CA, are pioneering concepts in capabilities such as computer-assisted rehabilitation and statistics-based preventive trauma care.

Exclusive interviews with key U.S. Army medical facility commanders serve as the issue’s centerpiece as we look into daily routines at current primary care centers. C&CC recently spoke with COL Evan Renz, Commander, Brooke Army Medical Center (BAMC), Ft. Sam Houston, TX, regarding the evolution in healthcare and healthcare professional development at DoD’s only Level 1 trauma care center. From BAMC to WAMC or Womack Army Medical Center, Ft. Bragg, NC, an exclusive interview with COL Ronald Stephens, Commander, provides insight into the use of an integrated, team-oriented approach to implementing quality personalized patient care.

Looking to the battlefield, critical advances toward the fielding of a versatile, next-generation tactical ground ambulance capability has Army and Joint combat medics buzzing. A recent award to AM General for upgrades to the company’s High Mobility Multi-Wheeled Vehicle (HMMWV) for ambulatory mission is also seeing the Army’s eventual addition of an Armored Ambulance (Extended Payload) variant for robust tactical application. In a spotlight on tactical emergency medical services (TEMS), recent advances in civil and defense combat casualty care application are changing the way cross-agency first responders share critical data in maximizing effective care implementation.

As always, thanks for your continued readership!

Sincerely,

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Developing Healthcare Professionals and Optimizing Readiness

C&CC recently spoke with COL (Dr.) Evan Renz, Commander, Brooke Army Medical Center, Ft. Sam Houston, TX, regarding the evolution in healthcare and healthcare professional development at DoD’s only Level 1 Trauma Care Center.

Interview conducted by C&CC Editor Scott Sharon

C&CC: How has BAMC evolved since its inception, and can you speak to its present-day core mission?

COL RENZ: A good starting point is our present-day mission. The Brooke Army Medical Center (BAMC) team is fully committed to promoting health and providing safe, quality, timely, compassionate, patient-centered care while developing healthcare professionals and optimizing readiness. We continuously strive to be our patients’ first choice when seeking any medical care available to them within our military healthcare system.

Since the very beginnings of Fort Sam Houston, TX, our population has required a military treatment facility; as the installation has grown, so has the medical capability. By the early 1940s, Brooke General Hospital stood as a major military hospital. The facility evolved into BAMC, which served Fort Sam Houston until 1996. That year, BAMC moved to its newly constructed home just a few miles away and where it remains today.

BAMC continued to advance in its capabilities and soon became a Level I trauma center. The next and greatest changes to BAMC’s mission occurred as part of the 2005 Base Realignment and Closure Act when the inpatient services from the Air Force’s Wilford Hall Medical Center (located on Lackland Air Force Base) moved to the BAMC campus, becoming what is now the San Antonio Military Medical Center (SAMMC). SAMMC is the core hospital of BAMC around which operate six separate outlying clinics. Moreno Primary Care Clinic and McWethy Troop Medical Clinic reside on Fort Sam Houston, while Taylor Burk Clinic at Camp Bullis and Westover Medical Home serve beneficiaries living in Northwest San Antonio. The Schertz Medical Home is located in the Northeast part of our city. The satellite Corpus Christi Occupational Health Clinic serves the Corpus Christi Army Depot.

Just as BAMC has evolved over the decades, so too have its principal partners in direct health care, education and research. Fort Sam Houston’s investment in medical education and training has markedly expanded as part of tri-service collaboration coupled with Defense Health Agency objectives. Collaboration and mutual support between BAMC and the Army’s Institute for Surgical Research (ISR) continues to flourish, honoring more than 70 years of synergy and teamwork.

C&CC: Please speak to some of the advances and lessons learned from CONUS-based support of combat operations during the past 14 years of continuous military operations.

COL RENZ: One of the things we believe contributed enormously to marked improvements in our survival rates -- the highest survival rates on the battlefield witnessed in American history -- is the rapid implementation of lessons learned from the battlefield. Effective implementation of advances requires far forward and timely data collection and analysis, closely followed by translation into clinical practice guidelines that are distributed to military providers both at home and abroad. Many of these practices become incorporated into civilian practice as word of their effectiveness and outcomes is shared among the professional communities and organizations.

One of the major advantages enjoyed on Fort Sam Houston and on the BAMC campus is the presence of several organizations, all focused on advancing combat casualty care. One such organization is the Joint Trauma System (JTS) located within the ISR and the Battlefield Health and Trauma Institute (BHT) located next to BAMC. JTS was initially established to spearhead the collection of combat casualty care data from the combat theater, and has exceeded all of its intended objectives, and continues to leverage both military and civilian research to improve practices. Many textbooks, particularly in trauma care, have been re-written in the last 10 years based on many of the lessons gleaned from the work of JTS.
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BAMC has enormous resources, including several capabilities that are unique within the Department of Defense. Serving as the sole Level I trauma center within the Military Health System (MHS), SAMMC is uniquely positioned as a readiness platform. Add to that the presence of the DoD’s only Burn Center, and SAMMC joins a very small group of facilities nationwide that can claim the combination of both a Level I trauma center and a burn center, each separately verified and accredited by the American College of Surgeons and its Committee on Trauma. An autologous bone marrow transplant unit is one more capability unique to the BAMC portfolio of services.

One of my most important responsibilities as commander of BAMC is to ensure relevancy and currency among our academic faculty by encouraging and supporting scholarship. The concept of Scholarship in Action helps us as an organization to bring together cutting edge clinical care, while ensuring we do not forget key concepts and skills necessary to provide care on the battlefield. Both teaching and clinical research are encouraged throughout the organization, on several levels, and in almost every area of practice. Often times, patients who visit our hospital or clinics do not realize how engaged our military medical providers are regarding research; they are often pleasantly surprised to learn that their individual provider has published and taught about a particular aspect of their care. One of my objectives has been to raise awareness and promote our military medical academic leaders, in all professions and specialties, as well as their many accomplishments.

Each and every day, staff members are working to advance safe, quality care. Over the past several years, clinical leaders have worked diligently to strengthen our ability to provide multi-organ system support in anticipation of being called upon to transport future combat casualties. Implementation of extracorporeal life support (ECLS) at SAMMC is a great example of the advancement of one such technology. Teams work and train together as they provide ECLS for some of our most critically ill trauma patients. Simultaneously, researchers are working on our campus to improve the technologies that are required to provide this support during long range evacuation missions.

C&CC: In looking at BAMC’s role in operating the DoD’s only Level I Trauma Center, please speak to some efforts in trauma care that are advancing TCCC field practices.

COL RENZ: When a service member is injured in Afghanistan or anywhere else in the world, a well-honed medical evacuation system is used to transport the patient safely and rapidly. Air Force aircraft, usually the C-17 platform, are utilized to rapidly transport one or more patients from anywhere in the world within hours of injury to one or more hospitals within the DoD system. Since 2001, the Landstuhl Regional Medical Center (LRMC) located in Germany, has served as the pivotal hub for air evacuation of our combat casualties. Many of the most severely injured casualties are moved from LRMC directly to the Walter Reed National Military Medical Center or to SAMMC, based on the injuries sustained and the Soldier’s home of record.

San Antonio is blessed to benefit from the services of two fully accredited Level I trauma centers. Together, BAMC and the University Health System join forces to provide 24/7 trauma care not only for San Antonio residents, but also for 22 counties of South Texas, which are part of the Southwest Texas Regional
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Advisory Council for Trauma. The skills implemented by medics, nurses, technicians and physicians in the trauma bays at SAMMC directly translate to the application of TCCC skills each and every day.

Typically, the majority, if not all of the care for trauma patients is provided during an initial episode of hospitalization; civilian emergency patients are provided care under the auspices of the Secretarial Designee Program, whereby the Secretary of the Army authorizes BAMC to provide emergency care for the benefit of citizens who live in our region. Providing emergency services for thousands of trauma patients each year helps maintain deployment readiness of our military staff. If we were not able to perform direct care for casualties of trauma on a daily basis, we would not be as well prepared to deploy or be able to provide the same level of lifesaving care for America’s sons and daughters when called to do so.

Our commitment to trauma care is evident throughout the campus. Construction of the consolidated tower included an expansive Emergency Department and Trauma Service on the ground floor of SAMMC. Rotary wing aircraft delivering patients may utilize either the large ground helipad capable of supporting multiple aircraft or the convenient rooftop helipad which was incorporated into the design of SAMMC.

The application of many of the TCCC principles can be observed each and every day at SAMMC. Medics and technicians, some assigned to the trauma mission and some in training, play an active and essential role in the provision of trauma care. By working every day in a Level I trauma center, our military staff remains in tune with TCCC methodology and the thought processes behind it. While caring for a patient in the continental U.S.-based mega-center is not the same as providing care in a field environment, the working environment provides a surrogate for talking about the principles and applying them whenever possible.

C&CC: Please speak to ways BAMC is partnering with joint medical/industry to advance trauma care.

COL RENZ: As a proud partner within the San Antonio Military Health System (SAMHS), BAMC facilities provide comprehensive care for more than 225,000 military beneficiaries living throughout the San Antonio metropolitan area. BAMC and its Air Force partner, the 59th Medical Wing and its Wilford Hall Ambulatory Surgical Center, forged the SAMHS to optimize military medical resources to better serve “Military City USA.”

Since 2001, BAMC has played a crucial role in the provision of care for combat casualties wounded in either Afghanistan or Iraq. SAMMC simultaneously provides emergency services during 80,000 Emergency Department visits annually and serves as the premier medical readiness training platform for both the Army and the Air Force; care extends throughout the globe as military providers continue to deploy to combat zones throughout the world.

The U.S. Army Institute for Surgical Research (USAISR) Burn
Center occupies the entire fourth floor of SAMMC’s consolidated tower; forty of the hospital’s 425 beds are designated for the Burn Center. Since March 2003, the Burn Center has treated more than 900 military personnel injured in overseas contingency operations. Since the initiation of U.S. military operations in Iraq, the USAISR Burn Flight Team has completed more than 90 overseas flight missions, transporting more than 300 burn and trauma casualties from Landstuhl Regional Medical Center in Germany to SAMMC for definitive care. The Burn Center – verified jointly by the American Burn Association (ABA) and the ACS-COT – serves alongside the Level I trauma center to provide emergency services for residents from 22 separate counties in South Texas.

Prominent on the hospital campus, and surrounded by four Fisher Houses, the four-story Center for the Intrepid (CFI) stands as an ever-present reminder of our enduring commitment to both the art and science of rehabilitation. Dedicated in 2007, the CFI was designed to advance rehabilitation and recovery of many our most severely injured combat casualties. Monumental advances in prosthetic care for amputees and functional restoration for patients undergoing limb salvage are among the hallmarks of the CFI. The construction of this unrivaled outpatient rehabilitation facility was funded by the donations of more than 600,000 Americans. Today, the CFI continues to serve our wounded warriors from ongoing operations, as well as veterans and others who have sustained severe injuries.
The U.S. Army’s current M997A3 HMMWV Ambulance program is expected to address a requirement identified by the Army National Guard and Army Reserve for an updated capability to deliver quality medical care on a common and ready vehicle platform.

By Kevin Hunter, C&CC Editor

Rock Island Arsenal Joint Manufacturing and Technology Center (RIA-JMTC) has partnered with Army Tank-Automotive Command (TACOM) Life Cycle Management Command (LCMC) and the Program Executive Office for Combat Support and Combat Service Support (PEO CS&CSS) to support the production of the M997A3 Ambulance.

RIA-JMTC is part of the organic industrial base and is a readiness provider for the total Army and joint services. Since the start of the M997A3 program in 2014, RIA-JMTC has reduced production cost of this system by nearly 15 percent as part of its continuous process improvement (CPI) initiatives. “This is achieved due in part by leveraging the expertise from program managers, engineers and the men and women on the factory floor,” emphasized COL Don Wols, Commander, Rock Island Arsenal Joint Manufacturing and Technology Center. “We know the Army, National Guard Bureau and Army Reserve are counting on us for this important mission.”

“This effort showcases the production capability available at the U.S. Army’s Rock Island Joint Manufacturing Technology Center, where vendor-provided chassis are integrated with a government-manufactured ambulance compartment,” said Mr. Steven Rienstra, Product Director, Light Tactical Vehicles, PEO CS&CSS. “The effort has already produced more than 500 ambulances and is positioned to deliver as many as 800 more under the current program based on user requirements and funding.”

Modular Capability

As an offering to address needs beyond the scope of current M997A3 requirements, AM General LLC has developed a new 2-litter armored ambulance integrated to a M1152A1B2 armored High Mobility Multi-Wheeled Vehicle (HMMWV). The new HMMWV Armored Ambulance answers the military’s need for a highly mobile, reliable, transportable and affordable ambulance for combat, peace-keeping, and humanitarian missions.

The AM General armored ambulance provides the protection, mobility and mission equipment for evacuation and treatment of patients and allows medical personnel to conduct medical procedures and treatments during tactical operations (en-route care) while being protected.

The new ambulance incorporates unique features including individual ambulatory patient seating, a built-in HVAC system, LED interior lighting, storage for medical supplies and equipment, access to the vehicle which meets the Medical Mission Doctrine, and flexible configurations for patients and medical personnel. Its design complements the versatility and other mobility advantages of the HMMWV.

The perimeter armor protection is achieved by removable appliqué panels. This is a modular, kitted approach armor to be removed for peace keeping missions, ease of repair for battle damage repair and low-cost upgrades with a different armor solution. Per the Medical Mission Doctrine, the ambulance is designed to provide easy access through entry/exit points for patient loading and unloading of litter and ambulatory patients. To accommodate easy access, the stowage load layout was also carefully planned and designed to ensure the fullest complement of medical equipment and supplies.

Medical Module Design

AM General designed the Armored Ambulance Shelter as a self-contained module for installation on the M1152 Vehicle at the manufacturing plant or in the field. The armored module can be fitted on any HMMWV M1152 Vehicle with the higher capacity chassis. In a non-armored configuration, the module can be fitted onto any, existing production, M1152 Vehicle. The plant or field service can use a crane or forklift to add or remove the Armored Ambulance Shelter from the M1152 using existing, standard lift connections.

The base Shelter body is constructed from aluminum bonded with adhesive and self-sealing rivets. No welding is required. The base Shelter body contains the roof and body construction to support modular armor weight within the gross vehicle weight requirements. All electrical equipment such as the interior lights, HVAC and fuel fired heaters are packaged above the 60-inch fording line.

AM General constructs the Shelter body with structural floor and wheelhouse armor of thick aluminum for mine blast protection. Thermal and acoustic insulation material along with spill liners are also installed on the side panels. The Armored Ambulance Shelter also provides ballistic protection.
AM General’s newly developed Advanced Life Support Ambulance is designed for a variety of U.S. and international combat, homeland security or disaster relief missions. The new ambulance incorporates unique features to meet the latest medical mission doctrine. The optional ambulance armor kit complements the versatility and other mobility advantages of the HMMWV by being available as either factory or field installable, increasing protection to meet customer unique demands.

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PORTABLE OXYGEN TECHNOLOGY IS NOW EASIER THAN EVER TO CARRY AROUND ON THE BATTLEFIELD. THE SAROS BATTLEFIELD OXYGEN SYSTEM IS A NEWLY-AQUIRED DEVICE IN THE U.S. ARMY’S ARSENAL OF LIFE-SUSTAINING EQUIPMENT IN COMBAT.

By Pamela Jackson, Panakeia and Ellen Bock, ADS, Inc.

The U.S. Army Medical Materiel Agency (USAMMA), a subordinate command of the Army Medical Research and Materiel Command (MRMC) will soon begin fielding a new, 12-pound portable oxygen generator that will drastically reduce logistical issues related to oxygen supply for patient care in the field. A recent partnering between ADS, Inc. with Panakeia, LLC and Chart Industries, resulted in a 4-year indefinite delivery / indefinite quantity (IDIQ) contract for 7,000 SAROS Battlefield Oxygen Systems.

USAMMA is expected to field the generators in its kits, such as air and ground ambulance, unit assemblages provided for forward surgical teams, EMT/trauma, pre-op and intensive care ward/post-op. The SAROS will augment the ‘D’ cylinder for patient care and transport, providing a continuous supply of oxygen for non-critical patients using rechargeable batteries or standard electrical power.

“Instead of lugging around 10 cylinders weighing nine pounds each, a medic now has a 12-pound device, which runs on a rechargeable battery and can produce three liters of 93 percent oxygen per minute,” said Maj. Norland James, assistant program manager of health care technologies at the USAMMA. “This is going to save the government countless dollars and reduce the giant logistical footprint that we have when it comes to patient care oxygen in the field.”

Besides its low weight, 30 percent lighter than a comparable commercial device, the generator also maintains the shape of a traditional cylinder. Most commercial oxygen generators are box-shaped. However, the Army required this device to fit where any regular cylinder would go on a Mine-Resistant Ambush Protected (MRAP) vehicle or Humvee. The explosion injured multiple soldiers and destroyed the vehicle. USAMMA continued the developmental efforts with SeQual Industries to make a lighter, equally robust product that would fit in the “D” cylinder racks of the ground ambulances. The culmination of the project became the SAROS Battlefield Oxygen Generator.

In 2008, the Army started deploying a ruggedized version of the Eclipse in their ground ambulances following an oxygen cylinder explosion inside an MRAP vehicle. The explosion injured multiple soldiers and destroyed the vehicle. USAMMA continued to partner with a new company, Panakeia LLC, to continue the partnership with the Army. Although SAROS was commercially available in 2011, the Army needed to follow the process and assure each milestone was achieved. After achieving final approval of the project in 2014, the contract was awarded in September 2015. The SAROS 9400-OGFPe can be ordered via NSN: 3655-01-648-5957 through ADS at (866) 845-3012.

About Panakeia, LLC
Panakeia, LLC specializes in marketing, training and distributing advanced medical products to military, pre-hospital care and EMS, law enforcement, fire/rescue, veterans administration and hospital critical care. Panakeia’s mission is to provide the medical community with unique solutions and innovative products that transform patient care and save lives. We bring medical innovations to life.

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About ADS
ADS Inc. is a leading solutions provider that proudly serves all branches of the U.S. Military, federal, state and local government organizations, law enforcement agencies, first responders, partner nations and the defense industry. The company’s medical team is comprised of multiple subject matter experts with backgrounds and experience in military medicine. Their specialties include, but are not limited to, combat medicine, custom medical kitting solutions, domestic preparedness, emergency medical services, evacuation & rescue, battalion aid stations and medical treatment solutions.
Warrior Expo is the premiere industry event that brings end users, program managers, and procurement specialists together with industry-leading solutions providers in an environment designed specifically for government and defense organizations. Attendees can take advantage of demonstrations, exhibits, and learn about the latest equipment, procurement, and support solutions for maintaining operational readiness.

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As the U.S. Army continues to develop and advance its next generation of battlefield ambulances, it will need to address the persistent threat of underbody blast and difficult terrain. The next generation of Army ambulances could begin to resemble the rest of the ground tactical fleet and incorporate blast resistant design, akin to a Mine-Resistant Ambush-Protected (MRAP) or MRAP All-Terrain Vehicle (M-ATV).

Regardless of design, ambulances will continue responding to incidents and casualties resulting from underbody blast events and environmental conditions. New vehicle occupant survivability and suspension system technologies are currently under development designed to decrease injuries resulting from underbody blasts or simply from poor road conditions.

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TenCate's ABDS Sentinel X is an Active Blast Defeat System (ABDS), proven to mitigate the deadly effects of underbody IED and mine events for the occupants of ground vehicles. ABDS is a compact, lightweight, “B-kit” bolt-on, survivability system that can reduce injury and improve mission effectiveness for blast resistant combat and tactical platforms.

ABDS delivers enhanced human survivability by leveraging the benefits of a blast resistant hull and mitigating launch acceleration, jump height, flight duration and the brutal slam down inherent in a typical underbody blast event. U.S. and Allied testing has demonstrated that reducing the impact of these highly destructive actions can yield significant reductions in fatalities and injury severity.

Specifically, data from sensor laden anthropomorphic test devices (ATDs) has repeatedly shown dramatic reductions in the deadly G forces, sometimes by half or more, that is transferred through a vehicle and into the occupants. The human body can withstand an impressive amount of G-force loading, but mine blasts typically exceed human limits. Lumbar, spinal, neck, head and brain injury are common killers during mine blast, but ABDS mitigates blast impulse to a level that humans can endure.

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**Platform Support**

Upgrade to the Army’s High Mobility Multi-Wheeled Vehicle (HMMWV) to include a new Enhanced Mobility Upgrade System.

Meritor, Inc., supplier of global supplier of drivetrain, mobility, and braking solutions, has introduced the HMMWV Enhanced Mobility Upgrade System. The system is a complete rolling chassis which offers troops increased mobility, durability and reliability over current systems that are hampered by the weight of heavier armor protection or payload requirements. It offers a suspension and driveline solution that supports multiple vehicle platforms, including tactical ambulatory vehicle applications.

The upgrade features Meritor’s ProTec™ Series 30 High-Mobility Independent Suspension. It accommodates additional armor or payload capacity by increasing the allowable gross vehicle weight (GVW) by greater than 9,000 pounds. The ProTec Series 30 improves ride quality and has a wider track to increase vehicle stability. Higher wheel travel allows for better mobility and higher-speeds in off-road environments. More than 55,000 durability miles of testing has validated system durability with multiple engine types, wheel and tire sizes and a range of GVW ratings.

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As Overseas Contingency Operations (OCO) slow, are we medically trained for future military engagements? In a world that is filled with uncertainty and conflict, it is important to be adequately prepared for future engagements. During the past 14 years, the U.S. military witnessed the lowest prehospital, battlefield casualty fatality rate (CFR) 2012-2014 at <9%. Once the casualty reaches a surgical asset, the CFR is <3%. This observation is directly related to the evidence based medicine guidelines of Tactical Combat Casualty Care (TCCC), developed by the Committee on Tactical Combat Casualty Care (CoTCCC) and the Institute for Surgical Research (ISR). These successful guidelines are based on battlefield casualty data collected by the Joint Trauma System (JTS). The trend for 2015 data shows the CFR is rising. Historically, the CFR is higher at the beginning of a conflict than what it was at the end of a previous conflict. JTS gathers data from TCCC cards and TCCC after action reports (AAR) recovered from OCO casualties. Data is also gathered at the Armed Forces Medical Examiner when casualties do not survive their injuries.

**Bringing Field to Classroom**

The solution to maintaining the medical advances achieved from OCOs is continued emphasis on tactical medicine training. Where can service medical teams, commanders, and command surgeons send medical personnel for realistic, centrally-funded, standardized TCCC training? Good medicine and good tactics are inherent to the Combat Casualty Care Course (C4), taught at Camp Bullis in San Antonio, Texas.

C4 provides initial pre-deployment, or sustainment Tactical Combat Casualty Care (TCCC) curriculum. This nine-day course trains Joint medical personnel to apply knowledge in an austere continuum of care from point of injury (POI), to Role II, and evacuation. C4 closes two gaps in medical care on the battlefield identified by the CoTCCC and ISR: first, military medical providers are not familiar with TCCC; and second, they do not understand or employ the scope of practice for a medic or corpsman. C4 is executed by DMRTI with the Combat Medicine Branch as lead.
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Additional courses are offered by the Tactical Medicine Branch including Advanced Burn Life Support, TCCC, Basic Life Support, Advanced Trauma Life Support Operational Emphasis (ATLS-OE), Trauma Nursing Core Course (TNCC), and Pre-Hospital Trauma Life Support (PHTLS). Courses taught through the Contingency Operations Branch are the Emergency Preparedness Response Courses, Joint Medical Operations Course, Joint Medical Planning Tool Course, and Hospital ICS Courses.

**Targeted Training**

Based on the student’s medical profession, they will attend a professional program (ATLS-OE, TNCC, or PHTLS) and upon passing the written and scenario test, will receive the appropriate certification and continuing education credits. C4 introduces medical personnel to the three phases of TCCC (Care Under Fire, Tactical Field Care, and Tactical Evacuation Care) and the concept of prolonged field care in an austere environment with delayed medical evacuation. Students are placed into an austere environment Forward Operating Base (FOB), and issued body armor, helmets, and M4 carbine simulators adding to the realistic training experience. In addition to the protective gear, each platoon is issued two stocked aid bags, a Warrior Aid and Litter Kit (WALK), and a SKED rescue system.

Students are placed into three platoons led by primary instructor cadre (PI), who have extensive deployment history, acting as platoon sergeants for accountability and instruction of subject matter expertise on tactical medicine. Each exercise has additional cadre to maintain an efficient student/instructor ratio. Students are challenged by being placed into leadership positions and required to make timely, decisive, tactical decisions. Each student platoon leader is given an operations order (OPORD) outlining the events of the week. Each evening a fragmentary order (FRAGO) is given detailing the next day’s events. Leadership is paramount to good medicine and good tactics.

Students demonstrate tactical medicine proficiency and decision making in six mission oriented exercises that stress the guidelines and phases of TCCC. Each exercise begins with a briefing and ends with an AAR. Casualty documentation and packaging for movement are stressed during each medical exercise. The C4 cadre instructs students on the importance of battlefield injury data collection to form the TCCC guidelines. These guidelines frame C4 and the medical exercises conducted throughout the evolution.

**Military Operations in Urban Terrain (MOUT)**

The MOUT medical exercise introduces the students to basic close-quarters-battle tactics utilizing a “glass house” training tool which mimics the floor plan of the target building. The casualty collection point (CCP) concept on a dismounted recovery mission facilitates this TCCC scenario.
Students are organized into eight person squads and given specific leadership and medical roles to execute. The mission is casualty recovery from a helicopter down scenario, forcing the squad to make entry into the target building. Stressors include limited visibility, loud battlefield noise, sounds of distress, and gunfire. Utilizing M4 carbines with “smart” magazines, basic squad tactics, and a Virtual Trainer Firearms Simulator (VTFS), students engage an interactive screen displaying enemy combatant avatars. Once fire superiority is gained, the squad recovers the casualties and establishes a CCP. Tactical Field Care phase interventions begin and are complete once each casualty is packaged for movement with documentation. Each casualty is moved to a simulated evacuation point manually.

Village Stability Operations (VSO)
The VSO medical exercise introduces the student platoon to planning for a medical capabilities operation. Utilizing a sand table, students use the 1/3 planning and 2/3 execution concept. Security, infiltration, indigenous medical care, and exfiltration plans are discussed. The village resembles structures from the Southwest Asian Area of Operations (AO).

The platoon approaches the village in tactical formation to conduct a key leader engagement. The medical personnel begin to treat role players masquerading as villagers. The operation comes under direct and indirect attack; students then progress through the phases and treatments of TCCC. The scenario ends at the rally point with the Quick Reaction Force (QRF).

Tactical Medicine Lane (TML)
The TML medical exercise is set in an African AO. Squads develop a plan as part of the QRF to recover casualties from a convoy attacked with an improvised explosive device (IED). The platoon must plan ground movement to the disabled vehicles and extricate casualties.

Roles are assigned and medical personnel treat each casualty as the squad maneuvers through various obstacles. Leadership determines the route and evacuation mechanism, TALON litter in the Warrior Aid Litter Kit (WALK) sled litter system such as SKED. In addition to employing leadership and tactical medical treatment, the exercise reinforces the need to evacuate to higher echelons of care as the combat situation permits. Good tactics and timely evacuation are vital as medical supplies are exhausted.

Mass Casualty (MASCAL)
The MASCAL medical lane exposes the students to the chaos of multiple casualties with limited supplies to treat at a Role I facility. MASCAL situations are common in a deployed and garrison setting. Planning allows students to react in an organized manner. The lane is initiated with a simulated vehicle-borne IED (VBIED) at the FOB entry control point. Casualties arrive and the students triage, treat, and package for evacuation. The scenario continues to present more casualties as stressors mount until the students are nearly overwhelmed. Cadre monitors students for timely and appropriate decision making and casualty care.

Prolonged Field Care
The Role II medical exercise extends the course instruction into the prolonged field care concept. Students apply ATLS-OE, PHTLS, or TNCC training from earlier course training to casualty care. Students are introduced to Role II scenarios complete with ancillary service assets (i.e. radiology, lab, blood), but lacking surgical augmentation.

Simulated casualties present different trauma cases. Students are assigned to a five person trauma team and delegated roles. Each bed and mannequin is proctored by a medical professional and simulation operator. Trauma teams rotate to each case bed and delegate new roles for maximum treatment exposure.

Students are introduced to Role III capabilities at the Air Force Expeditionary Medical Support (EMEDS) training site. Students observe the EMEDS tent structure, ancillary services, and patient flow through the emergency room, operating room, and the intensive care unit.

Tactical Evacuation Care (TEC)
The TEC medical exercise is a new addition to C4. The cadre creates emphasis to the TEC phase of TCCC to expand the prolonged field care concept. Students receive instruction on basic flight physiology, in-flight emergencies, aircraft familiarization, and TEC. Utilizing a UH-60 Blackhawk simulator, students initiate a 9-line request and mark a hasty landing zone.

TEC demonstrates continuous continuum of care beyond a facility and dispels impressions of limited casualty responsibility once loaded onto an evacuation platform.
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STRATEGICALLY CENTRIC, GLOBALLY-RESPONSIVE MEDICINE

COL Ronald Stephens assumed command of Womack Army Medical Center in May 2014. COL Stephens began his service with the Georgia Army National Guard as an infantryman. While in the Guard, he attended North Georgia College after receiving the Georgia Military Scholarship. Upon graduating Magna Cum Laude with a Degree in Chemistry, he was commissioned a 2LT and attended the Medical College of Georgia under the Health Professions Scholarship Program. After completing a Transitional Internship at Eisenhower Army Medical Center, he served as a General Medical Officer at Ft. McClellan, AL, then completed a three-year residency in Physical Medicine and Rehabilitation at Walter Reed Army Medical Center.

Since completing his training, COL Stephens has served as the Chief of a Physical Medicine and Rehabilitation Service and the Chief of a Department of Orthopaedics and Rehabilitation. He has also served as a Squadron Surgeon, Brigade Surgeon, Division Surgeon, Corps Surgeon, Command Surgeon for the National Defense University, and the Command Surgeon for US Forces-Iraq. He has also served as the Deputy Commander for Clinical Services of a fixed hospital and a deployed Combat Support Hospital. He has deployed to Bosnia-Herzegovina and twice to Iraq. COL Stephens has commanded the BG Crawford F. Sams U.S. Army Health Clinic, Camp Zama, Japan and U.S. Army MEDDAC-Alaska, Fort Wainwright, AK. He also served in the Pentagon as the Assistant Deputy for Medical Affairs in the Office of the Assistant Secretary of the Army for Manpower and Reserve Affairs.

COL Stephens is board certified in Physical Medicine and Rehabilitation and is a licensed acupuncturist. He has made numerous presentations at the local, national, and international levels. His military schooling includes the AMEDD Officer Basic and Advanced Courses, the Command and General Staff Officer’s Course, the Industrial College of the Armed Forces, the AMEDD Executive Skills Course, and the Interagency Institute for Healthcare Executives. Colonel Stephens is a member of the Order of Military Medical Merit, and served as the Consultant to The Surgeon General for Physical Medicine and Rehabilitation.

Interview conducted by C&CC Editor Kevin Hunter

C&CC: Please talk about your role as Commanding Officer, WAMC.

COL Stephens: At Womack Army Medical Center (WAMC), we refer to ourselves as the center of the center of the universe. My job as the Commander is to ensure everyone on our team has the resources, training, and time to do their jobs.

As the hospital Commander, I report to two senior Army leaders – the Commanding General of the XVIII Airborne Corps and Ft. Bragg, and the Commanding General of the Northern Regional Medical Command. I ensure we focus on our Surgeon General’s priorities: combat casualty care, a ready medical force, and caring for family members and retirees. Similarly, our Corps Commander’s top priority is readiness. As discussed, we are intimately involved in this critical requirement. While we work these priorities, our leadership relentlessly emphasizes safety – the safety of our patients and visitors, our staff, and our environment. Safety encompasses everything we do, from something as seemingly simple as proper hand hygiene to meeting the standards of The Joint Commission (TJC). We consistently stress the importance of safety with activities outside our facility as well. Womack is in the business of doing all we can to prevent accidents and unanticipated poor outcomes, whether in the operating room, on the road, or taking care of the yard.

I also consistently discuss our hospital vision with staff: One Team – Quality Care – Quality Caring.

One Team is easy to explain. Healthcare is a team sport and requires everyone involved, whether directly involved in patient care (providers, nurses, medics, medical support assistants, etc) or in support of them (logisticians, information management personnel, administrators, etc).

Quality Care is the science of medical care. Safety is a critical
Quality Caring is the art of medicine. Simply put, this means treating others with kindness and respect, dignity, and compassion. This tenet applies to how we interact with our patients and visitors as well as each other. We are here to care for patients, and a crucial aspect of that care is how we treat them. Everyone at Womack working in unison towards our vision will result in patients and a community that not only satisfied, but loyal and ultimately advocates for our healthcare system.

As Commander, I also spend a lot of time engaging our community, on and off post. We are always seeking feedback from our patients in order to recognize our outstanding teammates as well as discern opportunities to improve the services we provide. We also depend on our partners in Fayetteville and the surrounding communities, particularly the healthcare facilities who provide capabilities and capacity not available at Womack.

**C&CC: From a patient care perspective, talk about any current efforts at WAMC which are addressing immediate healthcare needs of a global Army, including lessons learned recent wartime engagement.**

**COL Stephens:** Womack privileges almost 1000 healthcare professionals. While some of them are assigned to units outside of Womack, they still provide care under our authority. We host numerous training events that include healthcare professionals across the installation designed to improve teamwork, communication, and quality of care provided. Many of our military personnel participate in the Professional Filler System program, in which those who are assigned to Womack augment the staff of deploying units to ensure they have all medical positions filled.

Womack supports numerous professional training activities. We have residencies in Family Medicine, OB/GYN, and Podiatry as well as programs for Nurse Midwifery, Certified Registered Nurse Anesthetists, Psychologists, Physician Assistants, and Oral and Maxillofacial Surgery, among others. Many enlisted medical personnel complete their training at Womack, including technicians specializing in radiology, orthopaedics, physical therapy, occupational therapy, and optometry. Every year, numerous medical residents complete rotations at Womack as part of their graduate medical education program. We also maintain partnerships with numerous civilian institutions where their students spend part of their training time at Womack. In addition to all these programs preparing the next generation of healthcare professionals, they also ensure our staff maintains currency in the latest healthcare practices and techniques.

Womack has a robust research program covering a variety of topics that impact our force. Even though our staff is small, the contributions of the scholarly activities they either conduct or support result in practice improvements that affect Army medicine in garrison and deployed environments. We recently hosted a symposium where researchers presented findings from some of their most recent projects. In March, our Family Medicine Residency Program, in concert with our research team, won the...
Combat operations over more than a decade have changed the way we all do business...a prime example is our Warrior Transition Battalion (WTB) complex, a facility where most of the services a wounded warrior would need are centrally located in one, easily accessible area.

Outstanding Achievement Award in Scholarly Activity. This was the second year in a row that they’ve garnered this honor.

Combat operations over more than a decade have changed the way we all do business. Our Warrior Transition Battalion (WTB) is a prime example. Our WTB complex is a facility where most of the services a wounded warrior would need are centrally located in one, easily accessible area. The WTB provides an environment where Soldiers can focus on healing and transitioning, whether returning to active duty or the reserves, or converting to veteran status. Before we had warrior transition units, Soldiers would go back to their assigned units, unable to perform their previous duties and unsure of their future in the military. Now they are assigned to this unit, which provides enhanced care and medical management. They have access to adaptive physical training and sports along with educational opportunities and transition assistance for those who need it.

C&CC: From a Joint perspective, please highlight some of WAMC’s efforts in support of long-term health initiatives across the Army and DoD.

COL Stephens: WAMC is working with DoD and Ft. Bragg Garrison leadership in support of the Healthy Base Initiative. This program emphasizes increased physical activity, obesity reduction, improved nutritional choices, and tobacco use cessation. The initiative is predicated on helping...
Commander’s Corner

servicemembers, retirees, and family members focus on wellness. Our Surgeon General’s Performance Triad combines sleep, activity, and nutrition to encourage healthy lifestyles. No matter who we are, how old we are, or what we do, devotion to the principles of the Performance Triad will build and sustain health, now and in the future. Of particular importance, adherence to these three components will contribute to the readiness of the force.

We are working to shift the patient experience at WAMC from a healthcare system to a system for health. We encourage members of the Army Family to incorporate health-promoting behaviors and decisions into their everyday lives. We take this seriously and have modified our own behaviors as well. The hospital dining facility completely revamped their menu to encourage healthy eating choices. For example, we no longer serve some foods that may taste good, but do not promote good health. It doesn’t make sense to tell our community to make healthy nutritional choices, but continue to offer unhealthy ones.

The Womack campus is tobacco free. We have a robust tobacco use cessation program which provides education and assistance to help our patients quit smoking, dipping, or using tobacco products of any kind. We are always trying to provide the information our community needs to make good choices that impact health.

C&CC: From an enterprising perspective, how is WAMC partnering with industry to deliver more effective and efficient know-how to the Army medical community?

COL Stephens: We partner with industry whenever possible to make sure we’re providing the best possible care and being responsible stewards of the taxpayer’s dollar. Currently, we are participating in a study with RTI International to test a medical procedure that treats post-traumatic stress disorder (PTSD). The procedure, called a Steellite Ganglion Block, is a low risk injection that blocks the sympathetic nervous system, commonly known as the “fight or flight” system, and may help to relieve PTSD symptoms.

Ft. Bragg’s Intrepid Spirit Center will open its doors in 2016. Ours will be the fourth center in the country dedicated to diagnosing and treating Traumatic Brain Injury (TBI), PTSD, and other related conditions.

We are also investing in a program sponsored by Agency for Healthcare Research and Quality known as Team Strategies and Tools to Enhance Performance and Patient Safety (TeamSTEPPS). In April, we conducted a three-day TeamSTEPPS training session for all surgery product line staff members. The event focused on communication, leadership,
situation monitoring, and mutual support. The training helped our staff improve communication across the spectrum of surgical care. We are already seeing the benefits of this event in many facets of our operations, particularly in the area of safety.

C&CC: Feel free to discuss any accomplishments and/or current/long-term objectives.

COL Stephens: We opened our newly renovated emergency department this past summer, which helped increase our capacity and provide our patients with a better experience, particularly more privacy. We also have one of the busiest OB services in the DoD, delivering around 250 babies every month. We recently began construction on an upgrade of our Mother-Baby Unit. When complete, all of our rooms on that ward will be private, again improving the experience for patients and families.

WAMC has three off-post clinics, which provide medical care to family members and retirees nearer their homes. We opened third facility in September to care for our patients living north of the installation. We will soon begin construction on a fourth community-based clinic southwest of Ft. Bragg.

In an effort to improve the patient experience in musculoskeletal care, we have moved Orthopaedics, Podiatry, Occupational Therapy, Physical Therapy, and the Brace shop to the same hallway so that patients who need care in those intimately related specialties can easily and conveniently access each of them.

The Ft. Bragg area has a large retiree population. Including our retirees and their families along with those on active duty and their families, our eligible population totals almost 200,000. We are planning to open TRICARE enrollment to retirees and their families so that we can provide care for everyone who wants to be a patient at the center of the center of the universe.

We also helped celebrate the service of our retirees on Oct. 24 by hosting Retiree Appreciation Day. The day invited retirees and their families to the hospital for education classes on numerous topics including tobacco cessation, relaxation, TRICARE, advance directives and nutrition. Providers were on hand to provide screenings and vaccinations, as well as trained legal staff who helped execute living wills, powers of attorney and advance directives.

It is truly an honor to command such an amazing team here at WAMC and care for the men and women who willingly volunteer to protect our great nation and all she represents.
Medical Steam Sterilizer

The Army will begin fielding a new water-efficient vacuum steam sterilizer for combat support hospitals that only uses 10 gallons of water to process up to 100 loads of sterilized medical instruments. The fielding of the new sterilizer model P2131 Automated Field Steam Sterilizer, produced by Fort Defiance Industries, will retire the model 2151 field sterilizer, nicknamed “Bertha”, that has been in use throughout the Army since the late 1960s.

The U.S. Army Medical Materiel Agency leaders accepted the first five model P2131 sterilizers Sept. 28, which were delivered to a maintenance depot in Tobyhanna, Pennsylvania. “The medical equipment we sterilize has become more complex, so we needed something that was more sophisticated and compliant with modern standards,” said Patricia Dubill, a biomedical engineer at the USAMMA Medical Devices Program Management Office and Integrated Process Team Chair.

Medical instrument steam sterilizers consist of a pressure chamber that processes pre-treated medical items with high-pressure saturated steam that kills any infectious materials that are present. The P2131 sterilizer is a pre- and post-vacuum sterilizer that enables proper conditioning of the load prior to the exposure phase.

Dubbil explained that combat support hospitals in the field have different requirements for steam sterilizers than other medical treatment facilities. In the field, they may have limited availability of power, water and personnel, and sometimes the medical equipment used in these locations has to operate under extreme temperatures, humidity and altitude. The P2131 not only has a water recovery system that allows it to use 90 percent less water than “Bertha”, but it also has a portable water softener system that substantially reduces mineral buildup on heating elements. The P2131 is just as sturdy as “Bertha”, yet weighs a little less, runs a faster sterilization cycle and is fully automated. Leaders also expect the P2131 to save money, reducing Total Lifecycle Costs by 30-40 percent.

“The successful testing, selection and procurement of this device highlights the U.S. Army Medical Research and Materiel Command’s continued commitment to partnerships with businesses who can deliver innovative medical military-relevant solutions to support the Warfighter,” said Dr. Kenneth Bertram, USAMRMC Principal Assistant for Acquisition.

The first few P2131 sterilizers will be placed at the Army Medical Department Center and School so that technicians can train on them. USAMMA biomedical equipment specialist Lamar Reese said the adjustment to the P2131 should be a smooth one, from an operational and maintenance standpoint.

More info: army.mil

Emergency Drones

The Defense Advanced Research Projects Agency (DARPA) has revealed plans to create drones which disappear after delivering food or medical supplies to remote areas.

DARPA’s Project Icarus, named after the mythological character who fell to earth flying too close to the sun, is intended to develop unmanned aerial vehicles (UAVs) that will disintegrate in the same manner once their missions are over.

The U.S. research agency said Project Icarus will create a fleet of tiny, single-use drones which will deliver emergency supplies -- such as food and medicine -- to remote areas during epidemics or disasters.

However, once their mission is over, each drone will “vanish” after landing thanks to the use of special materials which can transform their state or shatter into mere particles.

Project Icarus is built upon DARPA’s Vanishing Programmable Resources (VAPR) program, a two-year-old scheme which researches and develops self-destructing electronic components for use in the field by military personnel to prevent valuable technology from being acquired by the other side.

Project Icarus was born of the mythological character who fell to earth flying too close to the sun.

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DARPA’s Project Icarus and Project VAPR have developed materials which could potentially be used in vanishing UAVs.

Materials of interest include small polymer panels which switch from a solid to gas phase and electronics-bearing glass strips which can be triggered to shatter into ultra-fine particles.

In military applications, DARPA’s drones could be used to take over the burden of water, batteries and medical supply provisions. However, the vanishing UAVs may also be used in future emergencies by delivering goods, vaccines, insulin, blood, plasma and other urgent medical supplies to areas hit by disasters such as earthquakes.

DARPA says the option to forget entirely about the remains of delivery vehicles would not only improve logistics in emergency situations and in the military realm, but would also remove the environmental impact of leaving discarded transport vehicle components out in the field.

“Vanishing delivery vehicles could extend military and civilian operational capabilities in extenuating circumstances where currently there is no means to provide additional support,” Olsson commented.

“Inventing transient materials, devising ways of scaling up their production, and combining those challenges with the hard control and aerodynamic requirements to reach the precision and soft-landing specs we need here makes for a challenging and compelling engineering problem.”

More info: darpa.mil

Worldwide Clinical Systems Training

Planned Systems International, Inc., a leading provider of Health IT solutions to the federal government, announced it has been awarded a recompete contract by the Air Force Medical Service (AFMS) as a part of Team Systems Plus, entrusted with providing Clinical Systems Trainers (CSTs) to staff personnel at each of 74 Military Treatment Facilities (MTFs) worldwide. The firm-fixed price contract has a maximum two-year period of performance and a total contract value of $7 million.

Under this contract, PSI, Systems Plus, Inc., and team members Ocean Bay, MicroHealth, LLC and The Green Technology Group, LLC — will continue to deliver training to ensure that clinicians are educated and equipped to provide quality, cost-effective care in an increasingly electronic clinical environment. The training team plays a critical role in the day-to-day execution of healthcare delivery for a broad cross-section of stakeholders throughout the AFMS community. Medical personnel are trained on a variety of clinical systems including, but not limited to: ICD-10, AHLTA, CHCS, ESSENTRIS, MiCare, HAIMS, BHIE, CarePoint 3G, Dragon Speak, and As-U-Type.

More info: plan.sys.com
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More info: morzinemed.com

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Police, firefighters, and paramedics are facing challenges that tactical medicine can address. Recently, C&CC attended a two-day training event to assess what civilian responders are learning.

By Steve Melito, C&CC Correspondent

Across the United States, first responders are applying lessons from Tactical Combat Casualty Care (TCCC) to high-risk civilian medicine. School shootings, workplace violence, domestic terrorism, and targeted attacks on law enforcement officers (LEOs) and firefighters can require a response that combines emergency medicine with tactical and rescue operations. From cities and suburbs to exurbs and rural areas, civilian responders are asking for and receiving education and training.

Military medical responders are familiar with guidelines from the Committee for Tactical Combat Casualty Care (CoTCCC), but may be less familiar with the CoTCCC’s civilian counterpart, the Committee for Tactical Emergency Casualty Care (C-TECC). Though an independent civilian entity, C-TECC receives guidance and support from CoTCCC. For civilian responders, C-TECC guidelines inform the growing field of Tactical Emergency Medical Services (TEMS), which provides a robust framework for learning.

TEMS involves both classroom instruction and hands-on training. That’s why last summer, approximately 65 civilian responders from four Northeastern states gathered at Drury High School in North Adams, Massachusetts for two days. The event’s organizer, Amalio Jusino of the North Adams Ambulance Service, welcomed LEOs, firefighters, and emergency medical technicians (EMTs) from New York, Connecticut, Vermont, and Massachusetts. He asked them to keep an “open mind” about what they’d learn, and to think of themselves of as “a team” rather than as members of separate branches of emergency response.

Laying the Groundwork

Breaking down inter-agency barriers isn’t easy, but Jusino’s philosophy can succeed. As part of the Northern Berkshire Regional Emergency Planning Committee (NB-REPC), he recently traveled to Washington, D.C. to accept a 2015 Community Preparedness Award from the Federal Emergency Management Agency (FEMA). “We have a no-borders planning committee,” Jusino said of NB-REPC in an on-line interview with iberkshires.com. “Everyone has a voice at the table”.

Some civilian responders may feel they’ve been silenced, but there are leaders who listen. After Jusino spoke, North Adams Mayor Richard Alcombright told the TEMS trainees about his concerns for responder safety. Recent attacks on police officers across the U.S. are well-known, but Mayor Alcombright also noted a 2012 incident in West Webster, New York in which an arsonist shot and killed two firefighters.

The Mayor’s own experience also informed his support for two days of TEMS training. A former bank president, Alcombright recalled a May 2008 incident when the Massachusetts State Police (MSP) bomb squad was called-in to clear what was believed to be military-grade TNT and a detonator device from a failed robbery. “North Adams is a small city,” he explained, “but it’s a microcosm of larger urban areas”.

Another more recent incident illustrates how threats that may seem remote could challenge civilian responders, and force local personnel to address a mass casualty incident (MCI) that requires preparation and training.

Learning Hard Lessons

On July 4, 2015, FBI agents apprehended Alexander Ciccolo at his apartment in Adams, Massachusetts after the 23-year-old purchased four firearms illegally. Acting on a tip from Ciccolo’s father, a captain with the Boston Police Department, federal investigators found partially-constructed Molotov cocktails and pressure-cooker bombs. Ciccolo, who is known on-line as Ali Al Amriki, has been charged with plotting ISIS-inspired attacks on college campuses.

In North Adams, home to the Massachusetts College of Liberal Arts (MCLA), speculation centers on whether MCLA or a school in the Boston area was Ciccolo’s intended target. Regardless, said Sean Barry of Close Range Tactical Consulting, the lead instructor for the TEMS event, a terrorist attack on a school is “what keeps him up at night”. In the event of such an MCI, first responders in a geographically-remote area like North Adams would have to “hold the fort until outside help arrived”.

A self-described “hybrid” between an LEO and a medic, Barry has state and local police experience and is graduate of the U.S. Department of Homeland Security’s Counter Narcotics Terrorist Operations and Medical Support (CONTOMS) program. “Cops hate medicine,” Barry said, but they need “baseline skills” such as how
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to apply a tourniquet – even to themselves. At the same time, EMTs can’t wait to administer emergency medical care because “the patients will bleed out” while LEOs secure the area.

Barry taught TEMS attendees by examining attacks on LEOs in Massachusetts, and analyzing MCIs across the U.S. and around the world. Case studies included school shootings at Newtown, Connecticut and Columbine, Colorado; the Boston Marathon Bombing; and the Beslan School Siege in Russia. The MCI at Columbine High School led to major changes in operational procedures, Barry said, because “the shooter had control of the location for a long time” while medics waited to enter the building.

By contrast, medical care in the aftermath of the Boston Marathon Bombing was almost immediate. EMTs applied tourniquets, but so did civilians who tore their shirts into strips to create makeshift medical devices. An area near the finish line had been configured to support personnel in the event of an MCI, and five Level 1 trauma facilities were just miles away. Most communities don’t have as many hospitals as Boston, however, so local responders may be a patient’s only medical resource during the “golden hour”, the critical period after wounding.

Examining TEMS Technologies
Barry then explained how police officers in Ashland, Massachusetts are required to carry the Combat Application Tourniquet (C-A-T) from North American Rescue (NAR). A true one-handed tourniquet, the C-A-T uses a windlass system with a free-moving internal band to provide true circumferential pressure to the extremity. “It’s very easy to use,” Barry said, and attaches readily to a police vest. He also demonstrated the tourniquet’s use on his leg. “Get it as high as possible,” he advised, “and crank it tight”.

Next, Barry demonstrated the SWAT-T tourniquet from TEMS Solutions, Inc. “It’s like a tire inner tube,” he said, noting that the device is made of “strong, durable rubber”. According to published durability-test results, the stretch-wrap-and-tuck tourniquet (SWAT-T) can be stretched to 250% of its length over 5000 times without a reduction in effectiveness. The SWAT-T’s poly-isopropylene construction also withstands extreme heat and cold, weather conditions that many civilian responders face.

“Don’t be afraid to use tourniquets in the field,” Barry told the TEMS trainees. He then described several other technologies. Hemostatic agents such as QuickClot from Z-Medica are “great for areas where you can’t apply a tourniquet,” he said. Impregnated with kaolin, QuickClot non-woven gauzes conform to the wound site and won’t break down under pressure. QuickClot gauze typically stops bleeding within minutes and comes in easy-to-tear pouches that support field use.

Barry also demonstrated the Israeli bandage, which stops bleeding from hemorrhagic wounds. Designed by Bernard Bar-Natan, a former Israeli Defense Forces (IDF) combat medic, the Israeli emergency bandage is credited with helping to save the life of U.S. Representative Gabrielle Giffords, who was shot during a meeting with constituents on January 8, 2011. According to The Jerusalem Post, emergency responders in Pima County, Arizona had acquired the devices just months before the shooting.

Next, Barry showed a video that demonstrated the simulated
Local responders are the first line of defense, especially in geographically-remote places like North Adams, Massachusetts (Steve Melito, C&CC).

The use of a chest seal for intraosseus access. Designed for so-called “sucking chest wounds”, chest seals allow air to escape from the pleural cavity while facilitating lung re-inflation. The product in the video, North American Rescue’s HyFin Chest Seal, is a completely occlusive dressing that’s used for the treatment of penetrating wounds to the chest. NAR’s HyFin Chest seal forms a reliable seal under even adverse conditions and comes in an easy-to-open pouch.

Finally on Day One, TEMS trainees learned about lifts and carries. Barry mentioned collar drags and throw ropes, but focused on technologies from NAR and Skedco. NAR’s Talon II Model 90C Collapsible Hand Litter features collapsible handles and six points for IV attachments. The Sked Basic Rescue System is made of durable plastic and comes equipped for horizontal hoisting by helicopter. Participants would utilize these and other TEMS technologies during a simulated MCI the next day.

**Putting It All Together**

When police, firefighters, and EMTs arrived at Drury High School early on Saturday morning, Jusino and Barry provided an overview of the simulation that responders would face. A student had entered the building with a weapon, and several shots had been fired. J.D. Hebert, a security consultant and Assistant EMS Director from nearby Pittsfield, Massachusetts, added to the realism by applying moulage to mock victims. Thanks to the school’s audio system, the sound of screams and gunfire filled the hallways when responders entered the building to confront the active shooter, a role played by the author of this article.

Hebert reviewed the incident with C&CC after a group debrief with Jusino and Barry. “Everybody had a role in this,” Hebert said, and “police, fire, and EMS all worked together”. The victims, most of whom are trained first responders, also credited the participants for working together and providing an effective response. In a small Massachusetts city with big city problems, TEMS training was a success.
Historically, many innovations in military medicine have been born on the battlefield—hard-won lessons learned from lives saved and lives lost. But today, with technological progress and the growth of research and development, a significant number of military health advances are born in the lab and at research centers.

By Regena Kowitz, NHRC Public Affairs

“Our scientists translate research, development, testing, and evaluation into practical applications,” said CAPT Rita Simmons, commanding officer, U.S. Naval Health Research Center (NHRC), San Diego, CA. “The work we do leads to products, interventions, and tools that preserve the lives and limbs of our warfighters and keeps them physically and psychologically ready to meet the challenges of global uncertainty and maintain mission readiness.”

Additionally, NHRC research findings arm leaders within the Military Health System (MHS) and the Department of Defense (DoD) with vital information to inform policy and practice.

“What’s unique about NHRC is that our diverse professional staff and strategic location make us ideally suited to conduct operational health research that is expansive in scope while remaining agile and flexible to support mission requirements and the needs of the fleet around the globe,” said Simmons.

“Our location in San Diego gives us access to more than 95,000 active duty service members who serve in nearly every career field and type of duty the military has to offer,” Simmons said. “We can conduct research with air crews, aboard ships, with infantry units, with submarine personnel, in recruit training environments, and for special forces. You name it, and it’s geographically accessible to our team.”

Readiness Through Research and Development

NHRC was established in 1959 as the U.S. Navy Medical Neuropsychiatry Research Unit (NPRU), the Navy’s primary research capability in the areas of psychiatry and neurology. By 1979, NPRU was conducting research on numerous projects including developing psychological screening guidelines for Operation Deep Freeze. The Center for Prisoner of War Studies was initially launched at NPRU in 1974 to examine the health and psychosocial effects of internment among returning Vietnam service members.
In 1974, NPRU was re-designated Naval Health Research Center in recognition of the broadening of its research programs over the years. Since then, the research conducted by NHRC has led to many important developments including:
- Development of shipboard medical policy for women at sea
- Development of Navy Physical Readiness Test (PRT) standards
- Development of the Behavioral Health Needs Assessment Survey (BHNAS) to rapidly assess the psychological well-being of Sailors serving in combat.

Today, NHRC is housed in 24 historic military barracks buildings transformed into state-of-the-art laboratories and facilities overlooking the San Diego Bay. NHRC’s research spans the spectrum from physical readiness to joint medical planning and wounded warrior recovery to behavioral health optimization, all focusing on the total health and readiness of warfighters and their families.

**Mission Readiness**

The research team from NHRC’s operational readiness directorate specializes in understanding how physical and psychological stressors impact active duty military and integrating technology and medical advances to maximize their performance, enhance resilience, improve rehabilitation, and design tools to support medical decision-making.

“NHRC exists to support mission readiness,” said Simmons. “All our research and development activities are geared to finding solutions to health-related problems that interfere with our troops being physically and mentally ready to meet whatever challenges come their way.”

One tool that researchers with NHRC’s Warfighter Performance Department use to find solutions that improve readiness is the Computer Assisted Rehabilitation Environment (CAREN), which integrates virtual reality technology into cutting-edge research and development. CAREN technology incorporates multiple motion capture cameras, a large curved screen with three video projectors, surround sound, an integrated scent system, and a motion platform that combine to create an immersive virtual environment.

“Using the CAREN, our team is working to better understand the capabilities and limits of servicemembers,” said LCDR Jose Dominguez, Department Head for Warfighter Performance. “One way we use the CAREN is to examine how the design of military gear affects performance. If new gear is being considered for use with infantry troops, we can test prototypes by monitoring biomechanics to evaluate how it affects gait, posture, and performance as well as its impact on the musculoskeletal system to mitigate potential injuries. We provide all this information to leaders to inform their decision-making process and help reduce development costs when it comes to adopting new equipment.”
Other practical applications for the CAREN include rehabilitation for wounded warriors. Researchers at NHRC have found that patients with traumatic brain injuries (TBI) undergoing vestibular therapy on the CAREN show improvements. The CAREN is also used to work with service members who have lower extremity amputations to evaluate therapies aimed at helping them adapt to their prosthetics, reducing falls, and gaining full mobility.

NHRC is also conducting the Wounded Warrior Recovery Project, a DoD long-term study to assess recovery and quality of life of combat-injured service members. Researchers gather data from Navy, Marine Corps, Air Force, and Army personnel that can be used to develop improved treatments for service-related injuries.

“The work we do to support and promote readiness also has a positive impact on the quality of life for our service members, moving them to a state of optimal health,” said Simmons.

Military Population Health

“Our military population health team executes many of DoD’s leading epidemiological and behavioral studies,” said CDR Dennis Faix, director for Military Population Health. “Our researchers examine the effects of deployments and occupational experiences on the overall physical and mental health of servicemembers and their families.”

One project the population health team is responsible for is the Millennium Cohort Study, DoD’s largest longitudinal study in military history. Launched in 2001, the study was designed in collaboration with the Department of Veterans Affairs and all military services.

“With more than 200,000 participants, our team can collect data to evaluate factors that impact the overall health of service members and veterans,” said Faix. “When the study began, there was no way to foresee the military conflicts that would arise after 2001, but having this study in place has proved an incredibly valuable tool for understanding the impact that deployments and combat have on our military and their families. Research findings cover numerous topics including post-traumatic stress disorder (PTSD), depression, sleep hygiene, chronic illness, military sexual trauma (MST), and alcohol use.”

At NHRC, researchers are studying ways to mitigate combat and operational stress, improve mental and behavioral health, and promote resilience. The health and behavioral sciences team focuses on identifying risk and protective factors for adverse health outcomes and translating that knowledge into focused interventions and practical applications. Interventions and applications that have been developed from NHRC’s research include:

- A new treatment for comorbid PTSD and depression that combines evidence-based treatment for both diagnoses (cognitive processing therapy and behavioral activation) and compares the effectiveness of the combined treatment to cognitive processing therapy alone.
- Implementation of a customized program for the Navy’s explosive ordnance disposal (EOD) operators that helps them achieve and maintain peak physical and psychological performance.
- Highly realistic training for Independent Duty Corpsmen (IDC) students that increase overall and task-specific efficacy.

“The exciting part of R&D is when you see the science and research transformed into real-world tools that make a positive impact, not just on operational readiness, but also in the lives of our individual service members,” said Faix.

Global Health

Our military conducts operations globally, making it imperative to ensure the health protection of our forces wherever they may be. For NHRC, this means being able to identify and manage...
contagions that may impact our service members, directly or indirectly. From responding to outbreaks and conducting vaccine research to training foreign militaries on infectious disease prevention and treatment, NHRC scientists work diligently around the world to protect the health of service members while promoting global health security.

“Our team is very agile and responsive when it comes to supporting mission readiness,” said CDR Gary Brice, Director for Operational Infectious Diseases. “For instance, respiratory illnesses are common in crowded living conditions with large numbers of occupants—places like barracks and berthing spaces aboard ships. If there’s an infectious disease outbreak while a ship is deployed, it can compromise the mission. Our team can quickly respond to that, collect specimens, determine the pathogen responsible, provide the ship with testing capabilities, and inform stakeholders of appropriate prevention measures.”

Recruit training centers are also locations susceptible to outbreaks. In 2011, NHRC was instrumental in getting a new adenovirus vaccine FDA-approved after their study of eight basic training centers demonstrated the need for a vaccine. After the vaccine was implemented, there was a 99 percent reduction in observed febrile respiratory illness among recruits.

In addition to responding to outbreaks, NHRC provides a platform for vaccine and therapeutic clinical trials. By participating in clinical studies, scientists at NHRC are enriching scientific knowledge about vaccine efficacy and safety, including influenza and smallpox.

Another team at NHRC with a global reach is the DoD HIV/AIDS Prevention Program (DHAPP). They are DoD’s implementing agency for the President’s Emergency Plan for AIDS Relief (PEPFAR) and lead for providing HIV support and training to foreign militaries. The DHAPP team develops and implements culturally focused HIV/AIDS prevention, care, and treatment programs globally in over 65 countries and collaborates with multiple agencies to mitigate the HIV pandemic and stop the spread of the AIDS virus.

“When it comes to research, particularly infectious diseases, collaboration is imperative,” said Simmons. “NHRC partners with multiple organizations including the State Department, the Centers for Disease Control and Prevention (CDC), and the San Diego County of Public Health Laboratory in order to help identify emerging pathogens, reduce the risk of disease, and share knowledge that advances innovation and medical breakthroughs.”

Lead art: The CAREN system has a split-belt treadmill that runs the length of platform with an independent integrated force plate under each belt. The large curved screen, surround sound, and integrated scent system create a virtual environment. Body movements are acquired by a 10-camera motion capture system. (NHRC)
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