SOF Trauma Training

Commander’s Corner

MG Richard Thomas
Commander (Outgoing)
Western Regional Medical Command
Director (Incoming)
Health Care Operations
Defense Health Agency

Medevac: Future Vertical Lift

JC2RT: Research for Better Outcomes
JSOMTC
Medical Simulation
The Importance of Clinical Trials
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Do We Know Enough?
The DoD’s Joint Trauma System can take combat medicine to the next level through clinical trials.
By CDR James V. Lawler

Med Sim: Closing the Trainer to Real-time Gap
Army Medical Department (AMEDD) combat medic training is being revolutionized by state-of-the-art digital processing, linking training centers to the field.
By Phil Reidinger

Training Center of Excellence
Joint Spec Ops Medical Training Center
Producing World-class Combat Medics
Rigor and ingenuity characterize training the world’s best medics.
By Lt. Col. April N. Olsen
Q&A with Lt. Col. Lory Wheeler, Officer in Charge of the Special Operations Combat Medic Course

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JC2RT: Improving Standard of Care, Casualty Outcomes
Lessons learned have fueled the evolution of a Joint Combat Casualty Care Research Team.
By Members of Joint Combat Casualty Research Team #15

Medevac Spotlight
Future Vertical Lift
New helicopters improve the range and capacity of medevac.
By Mark Robinson

Command at a Glance
1st Special Ops Wing

Autonomy’s Next Frontier
The Navy’s latest unmanned critical care system
By Mark Darrah

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Cover: Soldiers training at the Joint Special Operations Medical Training Center provide medical aid to a simulated casualty. The JSOMTC, as part of the U.S. Army John F. Kennedy Special Warfare Center and School, trains about 1,500 SOF medics annually. (JFKSWCS)
As one year wanes and another beckons, we look back at 2013 as one of training and innovation in the world of combat medicine and ahead to what 2014 may hold for classroom to field readiness for the planet’s most capable, best-prepared military medics.

The Q4 2013 issue of Combat & Casualty Care (C&CC) spotlights Special Operations Forces (SOF) combat medics and the nuances that separate the SOF medics from their conventional counterparts. With greater focus being put on the unique capabilities offered by SOF personnel across a global battle space, those who provide tactical combat casualty care to these clandestine warriors are coming into an equally important light.

The leading entity in ensuring the readiness of these care givers to provide targeted trauma treatment is the Joint Special Operations Medical Training Center (JSOMTC), part of the U.S. Army John F. Kennedy Special Warfare Center and School, Fort Bragg, N.C. As part of the course training these SOF medics receive, the latest in trauma response classroom curricula combine hands-on and academic preparation tools in molding competent, field-ready first responders.

In an exclusive interview with MG Richard Thomas, outgoing commander of the Army’s Western Regional Medical Command, readers gain insight into continuing efforts to manage the largest U.S. regional chain of military-run care processes from point of injury to point of recovery. We also present a chronicle of early Army efforts at medical simulation and discuss avenues for future development in this area.

From home base to far from it, this issue takes C&CC readers to Bagram, Afghanistan, to get an on the ground perspective on the efforts of the Joint Combat Casualty Research Team (JC2RT). DoD’s largest foreign-soil based, independent medical research activity, JC2RT provides independent scientific review for all research projects addressing the health of servicemembers from mild traumatic injury to blast-related acute renal failure. In addition to a breakdown of their goals and focus, the Team’s deputy director presents his thoughts on the importance of clinical trials in the next conflict.

On a separate note, we hope that our readers have noticed and approved of Tactical Defense Media’s style changes over the past six months. We’ve been working hard to develop a clean, consistent, and modern look geared to improve the reader’s experience. However, substance comes first, and we are always open to your critiques, suggestions, and comments. Happy Holidays!

Sincerely,
Shean Phelps
Editor
Combat & Casualty Care
contact@tacticaldefensemedia.com

Sonia Bagherian
Publisher
Tactical Defense Media
soniab@tacticaldefensemedia.com

Christian Sheehy
Managing Editor
Tactical Defense Media
christian@tacticaldefensemedia.com

Cindy Stringer
Account Executive
Combat & Casualty Care
cindy@tacticaldefensemedia.com

Assistant Editors:
George S. Jagels
gorge@tacticaldefensemedia.com

Kevin Hunter
kevin@tacticaldefensemedia.com

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The U.S. Army John F. Kennedy Special Warfare Center and School’s Joint Special Operations Medical Training Center (JSOMTC) at Fort Bragg, N.C., is a tri-service facility home to the Special Warfare Medical Group (Airborne) (SWMG (A)) and the Naval Special Operations Medical Institute.

The JSOMTC produces Special Operations Combat Medics and provides Military Occupational Specialty (MOS)–qualified Special Forces medical sergeants and Civil Affairs medical sergeants for the Army, as well as Special Operations Amphibious Reconnaissance Independent Corpsman for the Navy.

“Special Operations Combat Medics must be able to provide medical care regardless of the conditions,” said Col. Sean Lee, commander of the Special Warfare Medical Group. “We ensure they have a thorough foundation in medicine that fosters a career of life-long learning in order to adapt to ever-changing medical challenges in uncertain operational environments.”

In the last year, the SWMG (A) has produced more than 1,500 Special Operations medics through entry-level medical qualification training and various recertification venues.

Biennially, all graduates are required to return to the JSOMTC to attend the two-week Special Operations Combat Medical Skills Sustainment Course. The course refreshes their critical skills and recertifies them for deployment with Special Operations Forces.

As part of the John F. Kennedy Special Warfare Center and School—the Army’s Special Operations Center of Excellence—JSOMTC and SWMG (A) underwent the rigorous ACE accreditation process in 2013, which increased the number of regionally accredited lower- and upper-level collegiate credit hours earned by Special Forces Medical Sergeant (SFMS) course graduates to 72 total hours. This will enable the students to receive requisite credit for the level of instruction received to achieve higher-level degrees supporting the SWCS life-long learning model.

SWMG (A) has planned, coordinated, and resourced efforts to increase the production of Special Operations Combat Medic Course (SOCM)–qualified medics from 64 students per class to 87 students per class. Currently, the course instructs more than 512 students annually. The initiative will support the expansion of Civil Affairs medical sergeants to meet increased operational needs as directed by the U.S. Army Special Operations Command and its higher headquarters, U.S. Special Operations Command. Lee said that this required an in-depth understanding and analysis of our current and projected resources to influence the budgetary process to procure buildings and materials necessary for expansion.

SWMG (A) conducts clinical rotations in 32 hospitals and four emergency medical services departments throughout the continental United States as part of both the SOCM and SFMS course Programs of Instruction. During the four-week SOCM rotation, students work with qualified civilian paramedics to gain realistic training at the point of injury. In addition, they also...
train with physicians in Level I trauma centers to hone their skills in a more diverse patient population.

“During the last year, we secured a bi-lateral agreement with the Hurley Medical Center in Flint, MI, to support the USASOC/USSOCOM–directed requirement to produce more SOCM-qualified medics, particularly for the Civil Affairs Regiment,” said Lt. Col. Lory Wheeler, the officer in charge of SOCM.

SOCM has also achieved a pass rate of 98 percent on the National Registry Emergency Medical Technician Basic Exam.

“Through superior teaching and instruction based on the requirements of the force, the JSOMTC is providing world-class combat medics for our SOF units,” Lee added.

Hydration and Electrolytes

By SGM (Ret) George Gurrola, Director of Military and Government Operations, Cera Products, Inc.

Delivering large amounts of water to combat outposts miles from large bases is a major challenge and dangerous mission. While water purification systems help treat ground and rain water, troops can use improved hydration in order maintain high levels of combat fitness on patrol or during training. Water alone does not prevent dehydration: it has no electrolytes, which the body loses in sweat and must be replaced. Even mild dehydration can impair physical and mental abilities; therefore, maintaining proper nutrition and appropriate electrolyte levels is critical for the soldier. Electrolyte replacement drinks such as CeraSport can prevent dehydration and reduce heat-related injuries, thereby maximizing the operator’s energy. A low-cost packet, weighing less than one ounce, can pack a powerful punch when dehydration is a key factor.

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**Q&A with the Lt. Col. Lory Wheeler**

**C&CC: How does the Special Operations Combat Medic Course (SOCM) program differ from conventional medic courses?**

**Lt. Col. Wheeler:** SOCM is longer and more in-depth. Most conventional courses are taught to the EMT-Basic level (as is SOCM for the first 25 days of the course). An accredited paramedic program, SOCM is taught to an advanced tactical paramedic level and differs from conventional paramedic programs. Our Program of Instruction (POI) is modified to allow a focus on combat trauma and prolonged patient management. A civilian paramedic may have to care for a patient for 30 minutes in the back of an ambulance en route to a hospital, whereas a SOCM might be caring for a patient with the same illness or injury for 30 hours until he can get that patient evacuated to a higher level of medical care.

Special Operations Forces do not have organic medevac assets and often operate in remote locations far away from a Role II medical capability. Therefore, a SOCM must be able to provide preventive and routine medical care in addition to initial stabilization and prolonged management for up to 72 hours for both emergency medical patients and combat trauma casualties.

**C&CC: How often is the POI updated?**

**Lt. Col. Wheeler:** One tenet of SOF training is to constantly incorporate lessons learned and best practices from the field. Based on both feedback from the force and an extensive internal review, SOCM underwent a massive POI restructuring in 2012, moving from a 26-week to a 36-week curriculum. Major changes included the movement of clinical medicine, which was previously taught in the Special Forces Medical Sergeants Course, into the SOCM course. Also added was a morning sick-call clinical rotation during clinical medicine training, ultrasound training, and an entirely new advanced trauma module.

This module, or SOCM’s Trauma III, consists of Tactical Combat Casualty Care, Military Working Dog Trauma and Emergency Care, Triage, and Advanced Trauma Management, and culminates in a field training exercise.

Currently, SOCM is on an annual POI review cycle that incorporates any new or changing requirements received from the Joint Medical Enlisted Advisory Council to ensure the skill sets of graduates meet the needs of the force.

**C&CC: Please describe the SOCM curriculum?**

**Lt. Col. Wheeler:** The SOCM trains and qualifies selected enlisted servicemembers in the management of trauma, medical emergencies, and routine medical conditions. This course is a prerequisite to the Special Forces Medical Sergeant Course (18D Qualification Course) and the Civil Affairs Medical Sergeant Course.

**C&CC: What are some of your goals or initiatives surrounding the SOCM program’s future development?**

**Lt. Col. Wheeler:** We are constantly focused on maintaining the currency, realism, and relevance of the POI. We continue to divest from lecture-centric instruction and implement more hands-on, small-group instruction. For our culmination field training exercise, we are moving to a 72-hour continuous exercise that will be the final fragmentary order of an operations order issued at the onset of Trauma III training. Also, we are undergoing a SOCM expansion to meet the needs of the force. Historically, we started each term with 64 students to a class; we are moving to 87 students per class by FY 2015. To meet this demand, we are also currently validating new instructors and working within the command to allocate additional training space.

More info: jsomtc.net
PASSING THE TEST
Becoming a SOF Medic

Special Operations Combat Medic Course:
This 36-week (180 training days) course teaches eight 64 student classes per year and is based on an approved critical task list, which is reviewed and updated by the Joint Medical Enlisted Advisory Committee (JMEAC) as directed by the U. S. Special Operations Command. The course consists of a series of didactic and performance-based learning objectives presented in a logical sequence, enabling the students to progress through the training both individually and as a collective group. The target audience for SOCM is Army, Navy, and Air Force enlisted servicemembers who hold, or are designated for assignment to, a special operations medical position. The course qualifies these enlisted servicemembers as highly trained combat medics with the necessary skills to provide initial medical and trauma care and to sustain a casualty for up to 72 hours. The SOCM must pass the Advanced Tactical Paramedic (ATP) Examination, which is a cumulative, externally promulgated written exam, to deploy as a USSOCOM medic.

Scope: The SOCM course is subdivided into individual modules. The SOCM student will be proficient in the following areas/objectives upon completing the course (see right column for examples).

- Basic Life Support (BLS)
- Anatomy and Physiology – instructs the structures and functions of the 11 organ systems and how to identify the anatomical structures and their functions on cadavers in the laboratory
- Trauma – instructs pathophysiology, assessment, and management of traumatic injuries
- Combat Trauma Management – instructs additional life-saving trauma interventions including hemorrhage control, cricothyroidotomy, venous cutdown and tube thoracostomy, and further enhances overall trauma management skills
- Advanced Trauma Management – instructs medical leadership and utilization of additional resources in the management of complicated trauma patient scenarios through the use of patient simulators
- Tactical Combat Casualty Care (TCCC) – instructs TCCC, triage, casualty collection point operations, and multipurpose canine emergency and trauma care
- Field Training Exercise – serves as the culmination exercise for the SOCM course and is a comprehensive assessment of training received throughout the course
- Clinical Rotation Field Internship – a clinical practicum designed to integrate didactic knowledge with practical experience

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m2 designed the RMT in 2001, and between 2002 and 2006, over 9,000 RMTs served with the Army’s 10th Mountain Division during multiple deployments. Their effectiveness has been verified: The division’s surgeon, LTC Drew Kosmowski, reported, “One of my [soldiers] was shot through the lower leg while on patrol in Baghdad. He would have bled to death had it not been for the Burke RMT.” The product is also endorsed and recommended by the National Tactical Officers Association.

At this year’s SOMA conference, m2 will introduce three new RMTs: a two-inch model, a pediatric model, and one designed specifically for K-9s. They will be at BOOTH 603.

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The first medical evacuation by vertical lift aircraft took place in Burma during World War II: A fledgling, brand-new technological break-through aircraft, the helicopter, airlifted wounded British servicemen over a four-day period. The story is both an amazing and revolutionary tale in itself, but it is particularly important as it set the future path for Army medevac.

Vertical lift aircraft design and development is advancing rapidly. Innovative aircraft systems will provide vastly improved performance, much greater speeds and ranges, and allow for increased lift capacity. These capabilities, which represent substantial enhancements over traditional helicopters, have been established as requirements by a joint team of subject matter experts and military leadership defined in an Initial Capabilities Document (ICD), formally approved on 10 April 2013. The ICD is the first major acquisition step in the Joint Capabilities Integration and Development System (JCIDS), the formal process by which the DoD advances acquisition of systems for the future, in essence the birth certificate of Future Vertical Lift (FVL). 

**Future Concept**

**U.S. JFVL Strategic Vision:** Over the next 40 years, the DoD will transform the Department-wide vertical lift fleet through the development and fielding of families of next-generation joint vertical lift aircraft that provide the advanced capabilities required to meet future operational requirements across the spectrum of conflict.

**Evolution**

As it was in Vietnam, the helicopter has become the main mobility enabler for the wars in Iraq and Afghanistan. The FVL concept came from Congressional inquiries prompting a look at future needs across the services’ vertical lift requirements. What will the services need to fight the wars of the future? To determine a path going forward, it is important to understand the evolution of medevac. With the initial World War II helicopter evacuations, the Army determined that it needed this capability and immediately ordered a new buy of helicopters. The numbers were initially small, particularly as the war was ending, but the stage was set. An incredible growth in helicopter use for wounded evacuation on the battlefield was seen in Korea, where the practice was designated as medevac, and the casualty survival rate increased substantially. Soldiers knew that if they were wounded, they would be taken to medical care as soon as possible. Helicopters, unrestricted by rough terrain or natural barriers, proved their worth as an evacuation system and established new methods for rapid treatment of the wounded and sick.

In the 1950s, the Army recognized the need for a truly capable medevac aircraft, with an enclosed cabin; greater speed, reliability, and carrying capacity; and the ability to treat the wounded enroute. Those capabilities were validated as requirements for an aerial evacuation platform, which evolved into the UH-1 Iroquois, or Huey. Yes, the Huey was designed as a medevac aircraft, with a wider cabin to take a litter sideways, with cabin space for a medic, and the reliability of a turbine engine. It could cruise at nearly twice the speed of the OH-23 and OH-13 aircraft of Korea fame. Patient survival rates climbed further to about 80-85 percent.

During the 1970s, the Army again reevaluated its needs and requirements for a new utility helicopter, advancing concepts for a more capable, faster aircraft with much more carrying capacity. The UH-60 Black Hawk was developed and acquired for the Army and offered as the new medevac platform. However, the aircraft was not medevac purpose built and had some growing pains. For instance, the width of the cabin was one inch too narrow to accept the standard NATO litter sideways with the cabin doors closed. Nonetheless, the Black Hawk has been a successful medevac platform in operations in Grenada and Panama through the Gulf War and later missions in Iraq and Afghanistan, with patient survival rates climbing above 90 percent.

In the 1990s, a specific set of requirements was added into a medevac-specific Black Hawk version, the Q model, that had a medical interior with six litter stations, a FLIR, oxygen generation and suction systems, a hoist, and medical attendant stations. These requirements later became part of the HH-60 series of medevac aircraft.
Increased range will facilitate fewer air ambulance transfer points, requiring much less logistical and security support for stops en route and allowing greater flexibility in positioning medical treatment facilities and forward surgical teams.

The Status of FVL

The DoD-directed FVL study conducted a Capabilities-Based Assessment (CBA) designed to outline a joint approach for future development of vertical lift aircraft and rotorcraft. It relied on subject matter experts from all the services to evaluate all requirements for vertical lift using the Army Aviation CBA as a foundation. The FVL strategic plan formalized the DoD vision for the next generation of vertical lift aircraft and rotorcraft, established joint requirements for them, and emphasized development of common service requirements. Speed, lift capacity, and range were all addressed in the gap determination within the larger scope of joint mission requirements. Civil industry concurrently formed a vertical lift consortium to develop and grow new technologies and new and innovative concepts for DoD vertical lift platform consideration.

Advanced Technology

It has been said that helicopters don’t really fly, they just beat the air into submission. Conventional helicopters require more power per pound to hover and fly vertically. They have inherent design limitations, particularly in speed, range, and carrying capacity. However, the aviation industry has developed new technologies that go well beyond the limitations of traditional helicopter performance. There are several vertical lift aircraft flying today that achieve speeds in excess of 250 knots and can fly substantially further than traditional helicopters. Concepts include compound aircraft, tilt-rotor, and tilt-wing aircraft designs.

Increased speed capability has the most pronounced impact upon medevac operations as it relates to geographic coverage, and maintaining the Secretary of Defense’s one-hour mandate. The Army should capitalize on these advances to increase efficiencies for the medevac role, as they can help save life, limb, and eyesight and provide the best possible medical evacuation system possible for the soldier.

Such an increase in capabilities will revolutionize medevac operations and provide for significant operational flexibility and greater options for medical asset deployment and footprint. Currently, medevac operational coverage by one air ambulance company is 40 nautical miles (nm), which is the planning coverage area to operate within the one-hour mandate. Future aircraft with 230-knot capability will be capable of operations up to 100 nm. Increased range will facilitate fewer air ambulance transfer points, requiring much less logistical and security support for stops en route and allowing greater flexibility in positioning medical treatment facilities and forward surgical teams.

The medical and aviation communities are working in concert with the services to ensure the FVL platforms have the required capabilities. Those attributes that will greatly impact medevac operations will be incorporated into the FVL designs from the beginning, ensuring the best possible medevac aircraft for our future force.
The 1st Air Commando Wing became the 1st Special Operations Wing (1st SOW) of the U.S. Air Force Special Operations Force 8 July 1968. Missions of the Air Force Special Operations Force and the 1st SOW were consolidated 1 July 1974, and the wing was re-designated the 834th Tactical Composite Wing, reporting directly to the commander of Tactical Air Command. The wing once again assumed its name as the 1st SOW 1 July 1975.

The 1st SOW was redesignated the 16th SOW on 1 October 1993 by Air Force Chief of Staff General Merrill A. McPeak, as part of an Air Force-wide unit renumbering. The 16th SOW continued its mission of providing a rapid reaction force for global special operations and to train aircrews to instruct and assist allied forces in all phases of special air operations. On 16 November 2006, the Air Force redesignated the 16th SOW back to the 1st SOW, Hurlburt Field, FL.

1st Special Operations Medical Group (1st SOMDG)

Purpose
SOMDG provides deployment medical care, readiness support, fit and healthy warfighters, community and workplace medical surveillance, and preventive medicine to over 22,000 beneficiaries. The Group promotes and maintains the health of approximately 8,800 base personnel.

Squadrons
1st SOMDG is comprised of four squadrons:
- 1st Special Operations Medical Operations (SOMDOS)
- 1st Special Operations Aerospace Medicine (SOAMS)
- 1st Special Operations Dental (SODS)
- 1st Special Operations Medical Support (SOMDSS)

1st Special Operations Medical Operations Squadron (1st SOMDOS)


Purpose
1st SOMDOS accomplishes global special operations taskings as an Air Force component member of U.S. Special Operations Command. The unit promotes and maintains health of 8,800 active duty, reserve IMA, and 1,800 civilian personnel, and 22,000 beneficiaries from 8 groups, 46 squadrons, 14 staff agencies, and 38 partner units. Personnel also provide behavioral health services, family medicine, diagnostics/therapeutics and ensure medical readiness, health protection, and performance enhancement.

More info: hurlburt.af.mil
The battlefields of the future will entail remote operations in hostile areas. Casualties in these environments will need to be transported back to definitive care more efficiently than ever before. Looking ahead, these transports may be done by unmanned or remotely piloted vehicles (RPVs). The Autonomous Critical Care System (ACCS), an Office of Naval Research program under the direction of Dr. Timothy Bentley with Athena GTX Inc. as prime contractor, is a multi-year effort (just completing its first year) to develop a highly mobile unmanned system mounted on a litter that will provide improved safety and outcomes to the casualty and medical personnel from these battlefields to definitive care many miles away.

Athena’s ACCS includes computerized advanced technologies for wireless telemedicine and near real-time monitoring, new miniature ventilation technologies, sustained oxygen supply/generation, multiple channels of controllable critical care IV/IO fluids, TCCC/PHTLS drugs, patient and fluid warming, and embedded decision support as well as provisions for testing and evaluation. Unique integration in the Athena efforts include advanced non-invasive cardiovascular monitoring of advanced parameters such as wireless 12 lead ECG, stroke volume, cardiac output, total body water, hemoglobin, differential pulse integrity, capnography, and cardiac power including trending of all vital signs simultaneously.

Technical cooperative efforts with Zoll Inc. has led to data integration with the Propaq and automatic defibrillation on board as well as with USAISR on burn therapies and multi-limb automatic tourniquet control (iTK). In addition, advanced dried plasma therapy is currently being designed for automatic use in the ACCS, and patient cooling for advanced TBI or neural injuries is under consideration.

Ultimate control of the system is supplied by a miniature quad-redundant integrated computer (Zeus) installed under the litter, with an embedded remote for physician control of all patient care via a unique medical Facebook–like Chat-R graphical user interface. Zeus command and control will provide up to six hours of poly-trauma unmanned care for one or two patients (simultaneously) while in flight. The system can run fully autonomously, in an advisor role, or under the command of the care-provider network. The end goal is to address most common battlefield casualty applications as they dynamically change while in transport via RPVs.

The Athena Zeus addresses the ONR’s Key System Attributes and Key Performance Parameters and meets stringent size, bulk, and weight requirements. Previous attempts to design and develop optimized care resulted in numerous devices hanging on or over the patients, or integrated trauma modules developments that resulted in systems that were functional but twice or three times the desired weight, size, and complexity of Zeus. Striving for 100 percent patient accessibility, Zeus has a total prototype weight of approximately 18 pounds (including fluids). The system is uniquely designed to open up and attach underneath a standard NATO litter. Interfacing with the system remotely can be done via any linked computer platform or smart phone while on the battlefield.

No user displays (and the power to run them) are integrated in the platform except those displays designed to communicate to the patient to reduce stress and anxiety. Zeus has the capability to address the mission concerns and interface through wireless communication or plug-and-play capability to the designed-in systems or to various physiological monitors and ventilators not in the baseline system, and yet it is entirely adaptive to the dynamically changing state of the patient.

Zeus will maintain constant remote care-provider linkage to the patient through wireless communications technologies so the patient can be constantly monitored and adjustments made to therapies. This includes multiple advanced non-invasive medical devices. Remote physicians will combine and summarize data feeds as needed in order to derive existing and new medical status indices. Advanced predictive and anticipative models are running inside Zeus based on trauma state to predict the need for life saving intervention and potential outcomes based on patient vitals and ETA. This is the core technology of Athena GTX and a major reason why the program will meet fast development timeline milestones. A remote reconfigurable web-based system displays patient vital signs and system status on compatible hardware with requisite display resolutions, including smart phones and iO/S products. Additionally, simulation and training via full motion video with sound and stimulation mode will allow the user to see all generated patient data remotely.
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Major General Richard W. Thomas is an Army physician and outgoing Commanding General of Western Regional Medical Command; Chief, U.S. Army Medical Corps and Senior Market Executive for TRICARE Puget Sound Multi-Service Market. MG Thomas has recently taken a new assignment as the Director of Health Care Operations at the Defense Health Agency, Falls Church, VA.

MG Thomas received his commission through ROTC upon graduation from West Virginia University (WVU). After graduating from WVU School of Dentistry, he served in the Army Dental Corps in Panama and with the 82nd Airborne Division. MG Thomas later returned to the WVU School of Medicine and received his Medical Degree in 1994. He was the outstanding graduate intern (Gillespie Award) at Brooke Army Medical Center, Fort Sam Houston, TX, and completed his residency in Otolaryngology/Head & Neck Surgery at Madigan Army Medical Center, Fort Lewis, WA, as the outstanding graduate (Wergeland Award) in 1999. MG Thomas is certified by the American Board of Otolaryngology/Head & Neck Surgery and is a Fellow with the American College of Surgeons. MG Thomas's military education includes the Army War College, the Army Command and General Staff College, and the Army Medical Department Officer Advanced and Basic Courses. He is also a distinguished honor graduate of both the U.S. Army Airborne School and Airborne Assault School and has completed the U.S. Army Jumpmaster and Flight Surgeon Courses. Prior to his current assignment, MG Thomas served as Surgeon General, USFORCES-Afghanistan and Senior Medical Advisor, International Security Assistance Forces Joint Command-Afghanistan.

MG Thomas's awards, decorations, and honors include the Distinguished Service Medal, Legion of Merit (with two oak leaf clusters), the Bronze Star Medal (with oak leaf cluster), the Meritorious Service Medal (with two oak leaf clusters), the Air Medal, the Army Commendation Medal (with two oak leaf clusters), the Army Achievement Medal (with three oak leaf clusters), the Armed Forces Expeditionary Medal, and various campaign medals. MG Thomas is a proud Honorary Member of the Sergeant Audie Murphy Club. His professional affiliations include the American College of Surgeons, the American Academy of Otolaryngology and various other national and international medical societies.

MG Thomas was interviewed by TDM Editor Kevin Hunter.

MG Richard W. Thomas

Commander (Outgoing)

Western Regional Medical Command

Director (Incoming)

Health Care Operations

Defense Health Agency

C&CC: Please talk about your role as commander of the Western Regional Medical Command.

MG Thomas: As the commander of the Army's Western Regional Medical Command (WRMC), my job is to oversee the delivery of the highest quality, patient-centered health care to approximately 400,000 beneficiaries across the Western Region’s 20-states that span from Alaska to Missouri. I oversee nine Army Military Treatment Facilities, two medical detachments, 11 Warrior Transition Units, and other Army medical assets. WRMC headquarters is located at Joint Base Lewis-McChord, WA, and includes a staff of nearly 150 military and civilian professionals who provide advisory and staff functions to the commanders at the treatment facilities across the region.

C&CC: Please talk about Western Regional Medical Command's background, mission, and role as part of the Army Medical Department and the greater DoD medical community.

MG Thomas: The Western Regional Medical Command (WRMC) is a team of teams—the biggest, the busiest, and the best. That’s the approach we take to caring for such a large beneficiary population comprising active, National Guard, and Reserve Component soldiers, their families, and retired
veterans and their family members. Made up of the Army Medical Department’s most talented health care professionals, the men and women of Team Western Region have consistently received recognition for their innovative approaches to caring for the servicemembers and families entrusted to their care. WRMC is a critical element of our nation’s ability to generate, and sustain, a capable, ready, and resilient force. Five of our military treatment facilities are co-located at major power projection platforms—Army installations with a trained and ready combined population of 130,000 active-duty servicemembers in places as varied as Alaska and Texas.

C&CC: From a patient care perspective, talk about some of the primary advances that are helping WRMC address the needs of combat casualties once they are transported to U.S. Army care facilities worldwide.

MG Thomas: The U.S. military has developed the finest trauma care system in the world. Our wartime experience has taught us that combat is the greatest catalyst for medical innovation. After more than 12 years of continuous combat operations, Army Medicine has changed the way trauma care is delivered on the battlefield and in the U.S. We are making a difference in the lives of people around the globe. We’ve seen medical advances emerge from healing those injured in combat; the survivability rate for combat-related injuries now exceeds 90 percent. This is, in part, due to the amazing chain of care process from the point of injury to the point of recovery, even when those two points are thousands of miles apart.

Military medics have also developed new strategies for managing traumatic brain injuries (TBI) and chronic-pain patients. Along with innovative approaches to caring for servicemembers with psychological wounds, such as post-traumatic stress, these strategies make U.S. military medicine the world’s leader in these critical areas. The Western Region will soon be home to three National Intrepid Center of Excellence (NICoE) satellite centers to enable state-of-the-art TBI care.

These NICoE satellites will provide a holistic team approach to servicing soldiers with traumatic brain injury and behavioral health concerns. The satellites provide an individualized four-week intensive outpatient program for servicemembers with symptoms secondary to traumatic brain injury, pain, and post-traumatic stress, and who are not otherwise responding to primary care medicine. The mission is to treat patients in the context of their whole life. It includes the patient and his or her family members as active members of the care team incorporated as decision makers.

This advanced response to issues such as TBI and pain management place Army Medicine at the forefront of what’s being done today to help people recover from injury.

At our military treatment facilities, we’re embracing a Patient-centered Medical Home (PCMH) model here at Joint Base Lewis-McChord (JBLM) and within the surrounding communities. PCMH is a concept that partners patients with their health care team.

Hallmarks of the PCMH concept include increased access to care through open scheduling, expanded hours, and new options for communicating, such as online secure messaging between patient and doctor. Community-based Medical Homes and Soldier-centered Medical Homes place medical care in the communities in which soldiers, families, and retirees live and work.

C&CC: How is WRMC working to promote partnering with industry in delivering more effective and efficient know-how to the Army medical community?

MG Thomas: The advances we develop in military medicine are due in large part to existing collaborative efforts with industry, private foundations, and university-based groups. We know that advances in medicine which are born on the battlefield will improve medical care for all. We have seen this with vaccination research, blood products, infection control, trauma care, and many other areas of medicine and healthcare.

We also firmly believe that the military has much to gain from partnering with the civilian medical enterprise. Here at JBLM, we’ve established a Collaborative Research and Development Agreement with the Bastyr University and the University of Washington to
advance quality, patient-centered medical care in civilian and military contexts, resulting in better pain relief, improved patient function, and greater patient well-being. The jointly managed projects under way will validate new technology, techniques, and procedures gained from the free exchange of information and ideas among institutions dedicated to the practice of medicine. This collaboration really underscores our commitment to provide the best health care in the world to our beneficiaries.

C&CC: How is WRMC addressing challenges regarding lessons learned on today’s asymmetric battlefields?

MG Thomas: The major question is: Does the U.S. military want to maintain a vertically integrated combat casualty care system? We’re in the 12th consecutive year of combat operations and caring for wounded, ill, and injured servicemembers has never been more important. The many successes and improvements in casualty care are only possible because of the dedication and service of our uniformed and civilian military medical teams. It is a mission we all take very seriously. It’s our sacred trust. We will continue to adapt as our military is evolving toward a more unified and joint environment, in which other services and other nations play an increasingly important part in saving troops on the battlefield.

Beginning this fall, the DoD will implement a new governance model for the military’s health care system. The Defense Health Agency (DHA) will represent an inter-service, joint administrative structure. This new agency will operate and oversee shared services, which will affect nearly all aspects of military medicine—policy, research and development, medical logistics, health information technology, education and training, the management of TRICARE and its pharmacy programs, and the design and construction of medical facilities.

Although the DHA will be jointly operated, the Medical Commands for each of the Services will still continue to operate separately because of the unique mission each performs: the Navy is trained to deliver care to units afloat and to deployed Marines; the Air Force has expertise in aerial platforms and the unique physical requirements of flight; and Army docs are trained to deliver medical ground support in combat theaters.

And that’s really why military medicine exists: To improve the health of our force and ensure we have a medically fit Army, Navy, Air Force, and Marine Corps. That mission will never change.

C&CC: Feel free to discuss any objectives WRMC has achieved or is working to bring to fruition.

MG Thomas: As Army Medicine establishes its identity as a “System for Health,” we’re increasingly focused on preventing injury and maximizing performance. The Army Surgeon General, Lt. Gen. Patricia Horoho, has made the “Performance Triad” one of her top priorities to address the health of the force and the health of their families. The Performance Triad represents physical activity, nutrition, and sleep—three key components that we understand to impact the cognitive and physical performance of soldiers. While each component is independently important, optimal performance is achieved when all three are addressed simultaneously.

The Performance Triad seeks to create a system of healthy behaviors that support individual soldier performance and overall unit readiness, as well as a lifestyle of healthy behaviors for soldiers and their families. By increasing soldiers’ awareness in these three areas, it is expected that performance and resilience will improve, thus improving soldier and unit readiness.

The Performance Triad supports the Army’s Ready and Resilient Campaign Plan (R2CP), which creates a holistic, collaborative, and coherent enterprise to increase individual and unit readiness and resilience. R2CP will build upon the physical, emotional, and psychological resilience in our soldiers, families, and civilians so they improve performance to deal with the rigors and challenges of a demanding profession.

More info: wrmc.amedd.army.mil
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Simulating Blood for Better Training

In the past several years, very realistic mannequins, originally developed for civilian healthcare providers, have been improved and adapted for combat casualty care training. These combat trauma simulators allow trainees to practice critical invasive procedures such as advanced airway management, needle decompression, placement of chest tubes, and defibrillation.

Unfortunately, blood simulants used for combat and civilian medical training have been very unrealistic. Missing are common characteristics of blood including its sticky yet slippery feel, color, opacity, scent and, most importantly, the way that it clots or “cakes.”

To directly bridge the realism gap between colored water and real blood, Luna has developed an advanced blood simulant. The result is TrueClot, which the company contends is the most realistic blood simulant available today. TrueClot Blood Simulant is a non-biological fluid that has been engineered to have color, opacity, and flow characteristics (viscosity) that closely match anti-coagulated human whole blood. The real innovation, however, is its ability to quickly form realistic simulated blood clots when used together with Luna’s TrueClot Simulated Hemostatic Dressing in order to provide maximum training effectiveness.

More info: lunainc.com

Advanced Burn Dressing Now Available in U.S.

North American Rescue LLC (NAR) has announced that they are welcoming the innovative new burn dressings from KIKGEL, a Poland-based company, to their product line. BurnTec is a modern hydrogel dressing used for a variety of skin injuries ranging from first, second, and third-degree burns (thermal, chemical, and electric). This dressing can also be utilized to provide relief from other skin injuries such as sunburns, abrasions, bruises, swelling, or insect bites.

When applied, the BurnTec dressing cools the injured area and ensures a soothing effect for up to 24 hours. The sterile non-stick dressing is absorbent, trapping wound secretion and bacteria within the gel.

The dressing is permeable to water vapor and oxygen but impermeable to bacteria, which helps protect the wound from external contamination while allowing it to breathe. The material is biocompatible and does not cause allergic reactions. BurnTec is FDA cleared and CE marked, and is currently being utilized in European countries. This hydrogel dressing is different from other burn first aid dressings due to itsstable-sheeting hydrogel structure. The dressing has been strengthened with a medical-quality non-woven fabric, giving it a stable structure that eliminates the risk of spilling or damaging the cooling hydrogel.

The BurnTec dressings are available individually or as a kit from North American Rescue and can be ordered through the company’s website or by calling their customer service department.

More info: narescue.com

iTraumaCare Finds Partner for Military Distributions

iTraumaCare, an early-stage medical device firm focused on developing traumatic injury solutions for first responder and military medicine applications, has selected Combat Medical Systems (CMS) as its U.S. Military distributor. CMS will spearhead sales and distribution of iTraumaCare’s iTClamp Hemorrhage Control System to various branches of the American military and Federal Government.

“The iTClamp fills the gap that currently exists in the Care Under Fire phase of tactical medicine. It’s intuitive and easily applied, and its impact on the challenges we face in hemorrhage control is significant,” said Corey Russ, President, CMS.

The iTClamp is designed to control severe bleeding—a leading cause of death in traumatic injury—in seconds. The iTClamp seals the edges of a wound closed to create a temporary pool of blood under pressure, which forms a stable clot that mitigates further blood loss until the wound can be surgically repaired. It is available in the U.S., European Union, and Canada.

CMS, founded by a team of military medical personnel and industry specialists, has a straightforward goal: simplify tactical medicine and decrease pre-hospital mortality. CMS is located outside Fort Bragg, N.C., which strategically positions the company to stay current on military medical trends.

More info: itraumacare.com

Specialized Burn Trauma Dressing Contract Awarded

Argentum Medical, leading manufacturer of metallic silver-based antimicrobial wound dressings, has announced that it has been awarded a contract by Biomedical Advanced Research and Development Authority in support of R&D and procurement of CBRN-threat medical countermeasures. Under the contract, Argentum Medical will conduct studies to evaluate the use of its Silverlon brand burn and wound trauma dressings for potential use on patients affected by mass casualty incidents involving radiation or vesicant exposure.

With the increased threat of nuclear and chemical terrorism, disaster plans call for an antimicrobial dressing for use in the management of combined injuries involving thermal, radiation, and chemical burns. If a mass casualty incident occurs, casualties are likely to exceed the capacity of the existing burn unit infrastructure. So an effective, long-lasting, and deployable dressing may be an essential countermeasure.

The contract consists of a two-year base totaling $7.8 million, with a possible additional three years of options, pending successful completion of critical milestones. These will fund the necessary research for Argentum Medical to generate the data needed to complete the FDA approval process for two new indications for Silverlon burn- and wound trauma dressings: burns resulting from exposure to ionizing radiation and chemical burns due to exposure to vesicant chemical weapons such as sulfur mustard.

More info: silverlon.com
Multi-Application, Multi-Response

By Adam Bement, Utilis USA

The Utilis USA Shelter system has been used as the main infrastructure component for field hospitals since 2008. The first field hospital system was developed in conjunction with Utilis SAS (a European partner) to aid and assist rural residents of Peru. Utilis USA has since been adopted into many U.S. military medical applications, most notably the Air Force Expeditionary Medical Support (EMEDS) deployable field hospital and the Special Operations Air Transportable Triage Unit (ATTU). Earlier this year, Utilis shelters were used to establish the only Afghan military-led expeditionary surgical facility in Helmand province.

We are also proud to be a valuable partner of Samaritan’s Purse, a nondenominational Christian organization that provides medical assistance to victims of natural disasters, war, poverty, disease, and famine. Recently, Utilis USA delivered shelters on short notice to support a contingent of Samaritan’s Purse professionals providing support and relief in the typhoon-ravaged Philippines.

Pressure-proven and Ready to Configure

The Utilis USA shelter system is ideal for over pressurization, which provides a sterile medical environment. The shelter floor is sealed to the outer fabric and, along with a filtration system, can keep the interior space safe for patients and staff. This has been successfully tested by the military in a Vapor Challenge Chamber both with a chemical and biological liner and with the resistant layer incorporated into the outer skin for a “Single Skin” solution. The system also performs well when under pressurized, helping to prevent the spread of contagious disease.

Utilis USA shelters have the ability to easily connect various sized standalone shelters to become an integrated theater field hospital. For instance, our EMEDS plus 25-Bed Hospital has 18 interconnected shelters that create separate areas for an operating room, emergency room, laboratory, sterilization, and patient wards connected by passageways that can be partitioned off.
Improving Standard of Care, Casualty Outcomes

The Joint Combat Casualty Research Team’s mission is to support research in theater and provide independent scientific review for all research projects addressing the health of deployed servicemembers while assuring the protection of human subjects.

By MC Goetter, EA Mann-Salinas, MJ Sklar, J Lawler, I Dewos, A Schnaubelt, HE Cortez, and DE Banks | Members of the Joint Combat Casualty Research Team #15 Bagram, Afghanistan

A Body of Oversight

The Joint Combat Casualty Research Team (JC2RT) serves as a supervising body of medical and healthcare-related research conducted by physicians, nurses, and allied health professionals (e.g., physical therapists and occupational therapists).

“We are a team of scientists and health care professionals with varied backgrounds from multiple disciplines,” said Mary Kay Goetter (Col, USAFR, NC, PhD), Senior Scientist, JC2RT. “Our team, now JC2RT 15, includes a laboratory officer, a biochemist, two infectious disease physicians, an internist with pulmonary specialty training, and two nurses, one specialized in the care of the burn patients and the other, a nurse educator,” she noted.

Research can be initiated and performed by many different care providers in theatre. In some instances, it fits the category of Performance Improvement, seeking to improve an established process, in which case the team’s role is consultative only. For research protocols, where the intent is to develop new knowledge, the JC2RT assists the investigators to write the protocols, paves the way for Institutional Review Board (IRB) approval from Fort Detrick, MD, and communicates with onsite research personnel. The team then monitors enrollment and reports on the progress of the studies, all the while looking to support the investigators as needed.

“Projects range from tactical military to basic science, with the focus varying from understanding the lessons learned over the past decade to developing new clinical methods to care for acutely ill patients,” Goetter continued. “The projects typically cross service lines and some protocols involve our NATO Allies. The team is particularly proud of the projects jointly administered with British services in Camps Bastion and Leatherneck in Helmand province.”

Some Protocols of Record

Currently, the JC2RT is engaged in approximately 50 protocols throughout Afghanistan.

Evaluation of Urinary Biomarkers as Predictors of Kidney Failure in Combat Wounded

Even if all possible lifesaving interventions are correctly and expediently performed, the extent of injuries to warfighters can be overwhelming. Casualties who would have succumbed to devastating wounds in the past are surviving, but with multisystem complications. Individuals who sustain traumatic injury or experience profound circulatory compromise (hemorrhage, shock, etc.) are susceptible to kidney failure. When a warfighter steps on an improvised explosive devices (IED) or is struck by a rocket propelled grenade (RPG), severe disruption to muscle tissue is the visible result. What is not readily visible is the release of muscle enzymes that disrupt kidney function. As these enzymes pass through the initial filter of the glomerulus, they damage the tubules.

The tubules are responsible for concentrating or diluting the urine. This toxic interaction between the enzymes and the tubular lining cells adversely alters the ability of the kidneys to filter and clean the blood.

Dr. Ian J. Stewart (Lt. Col., USAF), a nephrologist at the Institute of Surgical Research, San Antonio, TX, is researching the possibility of identifying who is likely to develop acute kidney failure, one of the more common complications of trauma. His protocol, “Urinary Biomarkers as Endpoints of Resuscitation,” will add to the body of knowledge of the kidney’s response to trauma. Examining the urine produced by the kidneys early in the post-trauma period may offer clues to help predict which trauma casualties are likely to go into acute renal failure. Determining the specific proteins (biomarkers) released from the affected distal tubule cells and when they appear in the urine has the potential to provide more information to physicians caring for critically wounded patients.

Some of these biomarkers have been studied previously but not in the context of combat trauma. Typically, providers relied on simple blood tests (blood urea nitrogen, creatinine) to determine renal function and define the extent of kidney problems. However, these tests don’t necessarily indicate renal failure until days after the injury and can be affected by many other non-trauma related factors. This study will evaluate the urine obtained from the trauma casualty.
within two hours of admission to the Intensive Care Unit at Craig Joint Theater Hospital in Bagram. Since many of these casualties have received massive blood transfusions to treat hemorrhagic shock, or have tremendous muscle injuries with poisoning of the kidneys by the release of the muscle enzyme creatine phosphokinase (CPK), they may have renal damage with scanty urine output.

“Dr. Stewart has posed the question ‘Is there a better way to predict renal function in these injured warriors?’” said Dr. Daniel Banks (LTC, USA, MC) and the JC2RT Director. “The hope is by addressing features in the urine … of these injured servicemembers we may be able to intervene to lessen the chance for renal failure.”

Research on injured warfighters may carry over into trauma management in the civilian sector. The underlying science and principles of resuscitation inherent in this study can be applied to diagnosis, treatment, and interventions for similarly young and previously healthy individuals involved in moving vehicle accidents and other “crush” injury events. “The goal is to gain as much information on the physiological changes in the kidney in response to trauma and subsequent resuscitation efforts so that providers can make educated assessments and informed decisions,” said Goetter.

Mild Traumatic Brain Injury

Besides devastating overt physical injuries, the blast effect of IEDs and RPGs have resulted in significant numbers of traumatic brain injuries (TBIs). At Camp Leatherneck, a multidisciplinary team of physicians, physical and occupational therapists, and mental health providers operates the Concussion Restoration Care Center (CRCC). Data has been collected on more than 1,100 military members with mild traumatic brain injury (mTBI) or concussion. TBI and mTBI are signature injuries of Operation Iraqi Freedom and Operation Enduring Freedom primarily due to the atypical weaponry of blast and explosive devices, in contrast to small arms and other munitions of past conflicts.

According to Dr. Joel Sklar (LCDR, USN, MC), the JC2RT scientific advisor at Camp Leatherneck, “Little scientific evidence is available to compare current therapies used for servicemembers with TBI to our previous approaches to care. There are no historical controls available as previous care was not structured as [it] is today. In a sense, we are just starting evidence-based medicine for the treatment of those with head trauma due to these blast injuries.”

Dr. Donald Hurst (LCDR, USN), a psychiatrist from the Naval Medical Center, San Diego, CA, tackled this problem with a research question: What factors cause one servicemember with blast exposure to have only a temporary adverse outcome while another with similar exposure takes considerably longer to recover? Military care providers are familiar with the MACE tool (Military Acute Concussion Evaluation), administered to each servicemember with a suspected concussion. The MACE can be administered daily as long as the MACE is within 2 hours after admission to the ICU. Although the MACE is a tool to diagnose, treatment, and interventions and the Automated Neuropsychological Assessment Metrics (ANAM). The ANAM is a test of short-term memory measured by the individual’s recollection of items and immediate past events as seen on a video screen. Depression and anxiety often occur in the aftermath of mTBI, as do post-traumatic stress and, sometimes, post-traumatic stress disorder (PTSD). The PTSD Checklist specific to the military (PCL-M) is one of the tools used in this study to assist in diagnosis and evaluation. Of course, the clinician’s evaluation integrates all of the information in determining if the individual is sufficiently recovered from the event to return to duty.

Dr. Hurst is also evaluating whether the outcome of a concussion following a blast injury is the same as the outcome of a concussion following a more “typical” head injury, such as hitting one’s head on the Humvee turret cover or a hard edge of a wall or furniture. He will use a similar approach to address the outcomes of these different etiologies of concussion.

Another researcher is homing in on the issue of the recovery of balance as a measure to determine concussion resolution. Dr. Shawn Spooner (LCDR, USN, MC), a family medicine and sports medicine physician, is trying to determine the best way to measure balance recovery. To find out, the principal investigators will compare two methods used for balance testing, the Balance Error Scoring System and the Sensory Organization Test. The postural instability testing for this protocol requires the military member to stand on both firm and foam surfaces, first with feet together, then on one leg, and then with one leg behind the other for 20 seconds, while keeping the eyes closed. Movement during the test results in point deduction from a total possible score in an attempt to quantify this measure of balance. A second procedure has the member on a swaying platform in order to assess postural changes following commands.
By incorporating objective measures that indicate concussion is resolving, injured warfighters will not be returned to duty before healing has occurred. By allowing for the healing process to fully evolve, and refining ways to determine that it has, subsequent mental health issues of anxiety, depression, and sleep disturbances can be mitigated and hopefully prevented.

“Golden Hour” becomes “Golden Minutes”

Uncontrolled hemorrhage kills in the first few minutes following a major trauma event. Traumatic injuries that sever major arteries at the upper leg (femoral), groin (junctural), or level of the pelvis (truncal) cause massive hemorrhage that can result in death within approximately three to five minutes. Application of tourniquets, and newer truncal hemostatic devices or pelvic binders, significantly slow blood loss, buying time to get the patient into the operating room where definitive treatment can occur.

One of the most significant effects of battlefield research has been the widespread use of tourniquets to control bleeding from trauma. Prior to 2003, this lifesaving intervention was considered dangerous and rarely used. However, as a result of the early efforts of the Joint Theater Trauma System data collection process and research facilitated by the JC2RT, tourniquets were recognized as life savers and are now issued to every deployable servicemember. Because of the measureable success of preventing massive hemorrhage on the battlefield, civilian first responders and law enforcement officials now carry and utilize extremity and junctional tourniquets.

Coagulopathy of Trauma

Hypothermia, acidosis (caused by poor tissue perfusion), and coagulopathy (poor clotting ability) are the “triad of death” in trauma. Combat casualty victims are often cold, bleeding, and not clotting effectively when they arrive at definitive medical facilities.

“One major hemorrhage occurs, no matter how much blood we transfuse, abnormal clotting as a response to massive transfusion, hypothermia, hypoxia, and the shock response become the next life-threatening challenge,” said Elizabeth Mann-Salinas (LTC, USA, NC, PhD), Senior Scientist at Camp Bastion, where much of this research is ongoing. “Careful calibration of the exact mix and variety of blood products can restore normal clotting and help ‘fill the tank’ to oxygenate the tissues. The use of fluid warmers can also increase core body temperature.”

These interventions can reverse the triad of death. Dr. Jurandir Dalle Lucca (LTC, USA, MSC, PhD), a research scientist assigned to Joint Immune Inflammatory Modulation of Trauma in San Antonio, is investigating the role of rotational thromboelastometry (ROTEM) in the immediate phase of trauma care in cooperation with the British medical teams based at Camp Bastion. ROTEM is a diagnostic technology that simplifies and accelerates hemorrhage management. This bedside visual inspection of the trauma patient’s clotting process allows medical providers to respond more accurately to coagulopathy by using precise and judicious transfusion of blood and blood components. The ability of the patient’s blood to clot is checked immediately upon arrival to the emergency department and progress of the patient’s clotting ability is tracked over the next 24 hours. “Curtailing the triad of death is also why immediate measures in the field to delay and avert hypothermia and administer blood products as early as possible in the evacuation process are so essential, even in conscious victims,” noted Mann-Salinas.

Improving Burn Casualty Management

Combat casualties who sustain burn injuries are transported as expeditiously as possible to the Army Burn Center in San Antonio. Critical periods of burn management take place during this global aeromedical evacuation process, particularly in preparation for transport and during the frequent hand-offs between care teams. Routine evacuation of combat casualties consists of at least 11 care teams with 10 hand-offs; each transition of care allows for possible errors. Risk of errors associated with this necessary process can be reduced with simple checklists to ensure both that all appropriate safeguards are in place and continuity of care is maintained. Checklists can prevent human errors, provide a memory aid to ensure critical tasks are performed, standardize treatment, facilitate teamwork, and support quality control efforts. However, there have been no efforts to date to incorporate simple clinical checklists into the management of the complex burn-injured casualty.

Mann-Salinas is leading an ongoing research project at Bastion Hospital in the development of simple checklists for use during the critical periods of patient evacuation.

Validation will be accomplished using high-fidelity patient simulators to provide consistent and reproducible patient scenarios. Additionally, this training platform can be used prior to deployment to prepare combat nurses for en route management of the complex burn-injured patient. As a result of this project, it is anticipated that simple to follow evidence-based checklists will be included in future revisions of the Joint Trauma System Burn Care Clinical Practice Guidelines in use by all care teams responsible for managing and transporting burn casualties from combat theaters.

Lifesaving Interventions

Each of the research endeavors outlined above points to the need for dynamic, standardized training responsive to ever-evolving and ever more lethal battlefields. While all military healthcare providers...
have had to refine and improve training, it is the medics at the point of care who offer the best hope for real breakthroughs. “People have realized how good hospital care is...what can we do to make pre-hospital as good as actual hospital care?” asked Banks. “Which interventions, traditionally done in the hospital/ Emergency Department (ED) setting … if done immediately would save life and limb? Or improve outcomes? Or relieve suffering?”

To realize these expectations, medic training has changed over the past decade and will continue to do so. One key alteration was the integration of all basic DoD medic and corpsmen medical training and moving the instructional programs to one location: Fort Sam Houston, TX. Understanding the areas where the Army and joint services can improve pre-hospital care has been the aim of the Lifesaving Intervention project. One of the ultimate goals is to provide an evidence base that will guide future development of medic and corpsmen training course curricula.

In the past decade, pre-hospital combat care has changed radically, particularly in how medics have been trained and in what specific interventions they are permitted to employ in the field. But are the medics making the right decisions? Does the tourniquet or intraosseous access placed under field conditions make a difference? Is it saving a life or causing an unnecessary complication for the Role 3 facility to deal with later? Questions like these prompted Dr. Vikhyat Bebarta (Lt Col, USAF, MC), a researcher at the Institute of Surgical Research in San Antonio, to further investigate the issue; he instigated the study "Lifesaving Interventions Performed by Combat Medics in a Combat Zone.”

"Pre-hospital care—that is the care delivered in the field and in the medical evacuation units by medics and paramedics in ambulances and helicopters—is increasingly recognized as a key to the injured servicemembers’ survival," Goetter stated. “The odds of survival are excellent in the hospital. Now the emphasis is on improving outcomes for care delivered in the field. The ability to correctly triage and immediately treat or intervene on life-threatening injuries is the driving force behind this project. We need to assure that medics are using their training judiciously and appropriately.”

At the core of Bebarta’s Lifesaving Interventions protocol is an assessment of pre-hospital care administered to combat wounded personnel by the combat medics and corpmsmen. The study seeks information on the over-all competence of the field medic and addresses whether the procedures were needed, whether other procedures should have been performed, and whether the procedures that were performed were done correctly.

When the wounded servicemember arrives at the Role 3 facility, an ED provider quickly surveys what interventions were done in the field and judges if the procedure was lifesaving or not, whether it was performed correctly, and whether other procedures should have been undertaken. (Role 3 hospitals in theater provide a level of care approximately equivalent to Level 1 trauma care centers in the civilian sector.)

Approximately 1,900 injured U.S., NATO, and Afghan military members have been enrolled to date, with many documenting multiple interventions performed on any one combatant.

The interventions evaluated are placement of tourniquets, pressure packing with or without hemostatic agent, nasal airway, endotracheal intubation, cryothroidectomy (a surgical airway procedure), chest needle decompression, chest tube placement, use of occlusive chest seals, pelvic binder application, intravenous or intraosseous lines, fluid resuscitation, administration of pain medication, and hypothermia prevention (space blanket or wool blanket).

Since the study is still underway, complete results and statistical analysis are still pending. Anecdotally, it has been noted that hypothermia prevention is infrequently documented. If field medics are actually employing hypothermia prevention and covering victims with a space or wool blanket, they are not documenting it. Failure to document or communicate actions to the rest of the receiving healthcare team is a very real problem. If these interventions are not noted or entered into the medical record, there is no way to know if the standard of care was met, if the transport procedures were done correctly, or if the interventions made a difference.

“Some medics may feel that any kind of documentation, such as filling out the trauma card, is a waste of time, yet that is our only link to know what was done,” Goetter noted.

**Constant Evolution**

Perhaps the single greatest good that comes from war and battlefield trauma is a better understanding on how to care for traumatic injuries, regardless of the cause. The DoD has assembled a program that invites investigators to develop and undertake projects with the potential to improve the quality of care in a structured manner while assuring the protection of human subjects. The efforts of all the joint combat casualty research teams and the investigators whose studies they have implemented can be distilled to a simple, important result: improved care and survival for humans suffering trauma. We believe that medics will always be at the tip of that particular spear.

More info: www.usaisr.amedd.army.mil
Do We Know **Enough?**
Better Evidence for Combat Casualty Care

You never know what is enough unless you know what is more than enough.
— William Blake

Why clinical trials are essential to the Joint Trauma System’s continuing efforts to improve combat casualty care.

By CDR James V. Lawler
Deputy Director, JC2RT

 Barely twenty years old, evidence-based medicine (EBM) has transformed medical practice and improved outcomes in patient care. Gordon Guyatt, who coined the term, described EBM this way: “Evidence-based medicine de-emphasizes intuition, unsystematic clinical experience, and pathophysiologic rationale as sufficient grounds for clinical decision making and stresses the examination of evidence from clinical research.” The DoD Joint Trauma System (JTS) embraced the concept of EBM in the development of its Clinical Practice Guidelines (CPGs), the introduction of which has significantly improved survival of combat casualties in the Iraq and Afghanistan theaters.

As JTS builds on its successes, the time has come to take evidence-based combat casualty care to the next level. The effectiveness of EBM hinges on the quality of the evidence. We need a higher level of confidence in what we know and what we don’t know to be certain that we are delivering the right care at the right time.

The Quality of Evidence Matters
DoD possesses unparalleled expertise in the care of combat wounded, but EBM teaches that expertise alone is insufficient for determining optimal clinical management. In fact, EBM is based upon the principle that experts are frequently wrong. The history of medicine and surgery is replete with testament to this principle. The Cardiac Arrhythmia Suppression Trial (CAST, 1989: post-MI anti-arrhythmic use actually increased deaths by 3.6 times), the Strategies for Management of Antiretroviral Therapy trial (SMART 1, 2006: structured treatment interruption for HIV resulted in 80 percent higher mortality), and the Normoglycemia in Intensive Care Evaluation–Survival Using Glucose Algorithm Regulation trial (NICE-SUGAR, 2009: tight glucose control for critically ill patients in the ICU actually increased mortality by 10 percent) are but three of many examples where conventional wisdom, supported by the best available evidence and expert opinion, was definitively refuted by large randomized clinical trials (RCTs).

In the above instances, evidence supporting the accepted best-practice included observational clinical studies in addition to in vitro and animal research. The evidence upon which experts made their (ultimately misguided) recommendations was good. It just wasn't good enough. In an effort to avoid similar errors in current practice guidelines, most medical professional societies now accompany their recommendations with some grade or rating of the supporting evidence. Most prominent grading systems—for instance, Grading of Recommendations Assessment, Development and Evaluation, or GRADE—impair the highest confidence rating only to evidence that is supported by well-designed RCTs. Observational studies are generally given moderate grades for evidence, with anecdotal reports and animal data receiving even less confidence.

Unfortunately, almost none of the evidence available in the combat casualty care literature would be considered high grade. Clinical research performed in theater is largely observational and retrospective, and it often employs historical-, unmatched-, or no controls. Any RCT data related to the management of blast or penetrating trauma is from civilian trauma systems, the applicability of which is debatable. The reader should not interpret these observations as criticism of our combat casualty care researchers or their work to date; indeed, given the constraints of the combat environment, resource limitations, and policy restrictions, DoD’s combat casualty care research enterprise has produced remarkably good data. But is it good enough?

A Surmountable Challenge
To answer the above question, and to continue improving patient outcome in the military combat casualty care system, we need better evidence. We know that our current practices work better than our old, but we don’t know which parts contribute what. This uncertainty also confounds analysis of future
Interventions. As our results continue to improve, effect sizes of new interventions will likely shrink, amplifying the effect of confounders. As we strive to understand the best pre-hospital care and appropriate application of new drugs and adjunctive interventions, larger, rigorously designed prospective observational studies and RCTs will be essential to ensuring the fidelity of our CPGs.

The complexity of performing such rigorous prospective studies and RCTs in combat trauma is daunting but not insurmountable. The civilian trauma research community has performed numerous such large trials, many of them influential studies on prehospital care. Ethics committees do approve well-designed intervention trials where consent is not possible, and investigators have used creative approaches to inform citizens and gain support for such trials within communities. With well over 100,000 patients entered in the DoD Trauma Registry, the Department has encountered ample patients to conduct numerous large trials during these last 12 years of operations abroad.

Next steps

Obviously, the time to conduct large prospective trials in Afghanistan has passed. However, when the next large conflict arises, we will likely be asking the same questions with no prospect of finding definitive answers unless we act now. DoD should commit to the execution of large prospective studies (preferably RCTs when possible) in combat casualty care. In order to do this, combat casualty care research will require significantly better supporting infrastructure in theater. Such support should include additional dedicated clinical research specialists, information technology staff, and data management support. Human subject research oversight also will need to be addressed, including clarification or revision of DoD policy regarding the waiver of informed consent as outlined in DoD Instruction 3216.02. Such an effort will require a streamlined but thorough review process.

Our wounded warriors deserve the best evidence-based care we can give them, and in order to deliver, we must develop the best evidence. If the combat casualty care enterprise were to pick the four to eight most pressing questions in combat casualty care and develop pre-packaged prospective studies that we could implement at the outset of the next major conflict, we could make tremendous strides in producing evidence with a high degree of confidence. These questions would not be difficult to identify, as many of them are asked on a daily basis in the battlefield and our role two and three hospitals: What is the appropriate use of tranexamic acid? Is ketamine a more effective analgesic than opiates in the field? Is transfusion capability in medevac worth the effort and potential delay? There are certainly many more. Only through better evidence can we be confident that we are delivering the right care at the right time.

The opinions or assertions contained herein are the private views of the author and are not to be construed as official or as reflecting the views of the Department of the Army or the Department of Defense.
DARPA created the Systems-Based Neurotechnology for Emerging Therapies (SUBNETS) program to pursue advances in neuroscience and neurotechnology that could lead to new clinical understanding of how neuropsychological illnesses manifest in the brain and to advanced therapies to reduce the burden and severity of illness in afflicted troops and veterans. The program will pursue a new investigative approach that establishes the characteristics of distributed neural systems and attempts to develop and apply therapies that incorporate near real-time recording, analysis, and stimulation in next-generation devices inspired by current Deep Brain Stimulation.

DARPA is specifically interested in evaluating the underlying systems that contribute to the following conditions as described by the Diagnostic and Statistical Manual of Mental Disorders: Post-Traumatic Stress Disorder, Major Depression, Borderline Personality Disorder, and General Anxiety Disorder. DARPA also seeks to evaluate the representation in the central nervous system of Traumatic Brain Injury, Substance Abuse/Addiction, and Fibromyalgia/Chronic Pain.

Dialysis-like Therapy
Combats Infectious Disease

DARPA has exercised an option agreement to proceed with year three of a five-year, $6.8 million contract that was awarded to Aethlon Medical, Inc. (AEMD), developer of selective therapeutic filtration devices to address infectious disease, cancer, and other life-threatening conditions, under DARPA’s Dialysis-Like Therapeutics (DLT) program.

The third year of Aethlon’s DLT contract contains eight milestones representing a potential of $1,534,099 in revenue opportunity. To date, Aethlon has invoiced $3,188,131 to DARPA for achieving fourteen of sixteen milestone objectives targeted in the first two years of the DLT program. The goal of the DLT program is to develop a portable device that removes “dirty” blood from the body, separates harmful agents, and returns “clean” blood to the body in a manner similar to dialysis treatment of kidney failure. The resulting device would decrease the morbidity and mortality of sepsis, thereby saving thousands of lives and billions of dollars annually.

In the DLT program, Aethlon has been contracted to utilize the Aethlon ADAPT system to create an extracorporeal blood purification cartridge that selectively eliminates sepsis-enabling particles from circulation to promote recovery and prevent sepsis. The Aethlon ADAPT converges advanced plasma membrane technology with high affinity drug agents to allow the selective yet rapid clearance of disease targets from the entire circulatory system without damaging blood cells or removing particles essential for health.

Compressed Light Temp Regulation

DARPA’s Optical Radiation Cooling and Heating in Integrated Devices (ORCHID) program demonstrates squeezed light in a chip scale within the architecture of Microelectromechanical systems (MEMS), ubiquitous in modern military systems such as gyroscopes for navigation, tiny microphones for lightweight radios, and medical biosensors for assessing the wounded. Such applications benefit from the portability, low power, and low cost of MEMS devices.

In the latest program milestone, ORCHID researchers at the California Institute of Technology have reported a new method to generate specially-tailored “squeezed light” on a chip. The squeezed light approach is just the latest breakthrough in a program that quickly transitions basic research to practical applications.

Since its launch in 2010, ORCHID has also developed integrated optomechanical devices for low-phase-noise microwave oscillators, which are useful for a variety of DoD applications including secure communication, navigation and surveillance. ORCHID technologies have also benefitted optical signal processing for on-chip light delays, switches, efficient optical wavelength conversion, light storage and high-speed tunable optical filters.
Pursuit of Scalable, On-demand Blood for Transfusions Could Yield Novel Means of Therapeutics Delivery

Red blood cells are the most transfused blood product in battlefield trauma care. Unfortunately, they are sometimes in limited supply in a battlefield environment. DARPA created its Blood Pharming program to potentially relieve this shortage by developing an automated culture and packaging system that would yield a fresh supply of transfusable red blood cells from readily available cell sources. If the program is successful, it will eliminate the existing drawbacks of laboratory grown red blood cells, including cost, production efficiency, and scalability, compared to those grown inside the human body. Pharmed blood could also offer additional benefits. These potential benefits include eliminating the risk of infections from donors, on-demand availability, avoiding the detrimental effects of storing donated blood, and circumventing the issue of matching blood types between donor and recipient.

Before pharmed blood becomes practical for common use, the production costs must be significantly reduced. Under the Blood Pharming program, DARPA has decreased the cost of the chemical stock required to support blood growth for one unit of blood from more than $90,000 per unit to less than $5,000 per unit. DARPA believes that future reductions in the cost of chemical stock for unmodified red blood cells will eventually make pharmed blood practical for basic transfusions.

Recently, in addition to reducing production costs, DARPA performers have been investigating how pharmed red blood cells can potentially be modified to offer value-added benefits to the recipient beyond replenishing lost blood. Specifically, the Blood Pharming program is currently pursuing proofs of concept for customized red blood cells that offer such novel functionality. A group of program performers led by Celgene Cellular Therapeutics is exploring ways to modify the surface or interior of red blood cells to serve as vessels that can hold a variety of medical payloads, including vaccines, anti-toxins, diagnostics, antibodies to neutralize pathogens, and novel therapeutics. Unmodified blood could be taken from a donor and modified to deliver a particular medical payload. This modified blood could then be grown outside of the body and returned to the donor to provide a desired clinical response.

Since mature red blood cells do not contain a nucleus, their successful customization would represent a new class of cellular therapeutics that would provide DNA-free delivery of biologically based vaccines and therapeutics to treat disease and respond to trauma. The modified blood cells could benefit a recipient for up to 120 days (the lifetime of a red blood cell) before naturally expiring from the recipient’s system, extending the effective window of some therapies from hours to months. Other modifications to red blood cells could result in universal donor cells that do not provoke immune reactions in recipients. In standard blood transfusions, the blood types of donor and recipient must be matched, which can be an issue when certain blood types are in low supply.

“We are pursuing several promising approaches to modification of red blood cells to carry payloads,” said Dan Wattendorf, DARPA program manager for Blood Pharming. “One line of research involves coupling proteins on the surface of a red blood cell with an inert chemical handle that can attach to virtually any payload. We’ve been initially successful, and even better, our team has shown that modifying these cells doesn’t disrupt the ability to continue to grow them in a laboratory or to survive in an animal.”

More info: darpa.mil
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To make our university yet more affordable, AMU offers a book grant so that undergraduate students do not have to purchase their own books or pay shipping costs. This represents a huge savings for our students, since typical course material costs at a university can total several thousand dollars over the period of enrollment. This grant is available to all undergraduate students who are seeking college credits for the training and skills you earned in the military is always a priority at Kaplan University. We’re pleased to announce that the 36B and 42A Military Occupation Specialties (MOSs), with a skill level of 30 or more, have been evaluated and may translate into credit toward your associate’s degree in business at Kaplan University. If you have not reached skill level 30 or above, you may still be eligible for credit from your military training.

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Present day combat medic training is focusing on the use of task trainers to better prepare medics for combat realities.

By Phil Reidinger, U.S. Army Medical Department Center and School Ft. Sam Houston, TX

Historically, the cardio-pulmonary resuscitation course—during which students had to breathe into and perform chest compressions on a mannequin known as the Resusci Anne CPR doll—which became available in 1960, has been the most frequent medical simulation exercise in training. That type of training remains, but it has become a much smaller percentage of the training done today. Advances in technology, both in computing power and miniaturization, and new methods used to create the physical trainers wanted by the medical community have advanced the types of simulators and simulations. Driving this greater need for trainers and training modalities is the search to find the best balance in perfecting individual crafts while promoting increased patient safety.

At the Army Medical Department (AMEDD) Center and School, we use simulations and human-patient simulators throughout our training programs, from taking vital signs to simulated battlefield casualties, to allow students to see the types of injuries they will need to be able to take care of when deployed.

We begin with very basic instruction on how to take vital signs, pulse, respirations, and blood pressure. We can program simulators to have abnormal readings that students would not see practicing on each other in class. The simulators are also used for patient assessment to learn a systematic method for checking a patient from head to toe. Regarding battlefield medicine, we have simulators that are designed with the types of wounds that we expect our medics to see in combat. For example, students will see penetrating trauma with extremity amputations in order to practice the lifesaving interventions these casualties will need to keep them alive.

The Department of Combat Medic Training and the Center for Predeployment Medicine employ scenario-based training using human patient simulators of various levels of sophistication in realistic and stressful training events to “crawl, walk, and run” students through individual and team as well as single- and multiple casualty-oriented training events. Students are evaluated in daylight and in limited visibility scenarios. These training events were developed using lessons learned from operations in Iraq and Afghanistan, with students receiving an on-the-spot critique of what they performed well and possible alternatives that may produce a more positive outcome.

An Intricate History

For hundreds of years, medicine and health care has used intricate models to help teach anatomy, physiology, training in obstetrics, and many other surgical disciplines. According to an article by Harry Owen, titled “Early use of simulation in medical education” in the April 2012 issue of Simulation in Healthcare, as early as the 18th century, mid-wives and obstetricians in Italy were trained with simulators that could leak “amniotic” flood and fake blood to recognize and manage complications associated with childbirth.
Life-sized medical manikins were a standard training aid in Army training hospitals prior to World War I. With the establishment of the Army Medical Field Service School (MFSS) in 1922, manikins were used to teach basic hospital care such as bandage application, sheet changing, lifting, and transport techniques.

In 1943, war wound moulages were developed and standardized for training by the Medical Department but had limited distribution because of the shortage of rubber. With the development of a synthetic rubber, the Army Surgeon General ordered them to be mass produced. Two years later, the Army Medical Bulletin announced that standardized sets were being produced at a rate of two sets a week and being made available for “all Air, Ground, and Service Forces” to inject realism into their training. The kits included two life-like masks. One depicted a shell fragment to the head and the other, a gunshot wound to the jaw.

When the MFSS moved to Fort Sam Houston in 1946, simulated casualties were the responsibility of the Visual Aids/Graphic Illustration Department. Staff members were described as being able to prepare plastic, clay, and paper mache mannequins and models [including animal parts of anatomy] for use in the classroom and community outreach events. One of the highlights of the Army Week Celebration from 6-12 April 1947 was the surgical tent where a realistic “amputation” operation was demonstrated twice daily.

In June of 1950, the Medical Department participated in LOGEX 50 at Fort Belvoir, VA. There was very little realism to the exercise considering the point was to “afford student officers practical experience, under stimulated combat conditions, in planning and conducting operations in an active theater.” Casualties were written on cards and transportation was represented by different sized envelopes.

In the mid-1950s, the San Antonio Light and Evening Express described the use of moulaging during MFSS demonstrations. According to newspaper accounts, the simulated wounds made from plastic looked “shockingly like torn flesh.” The fake wounds would pump “blood” by pressing a ketchup-loaded bulb while the “piercing” cries of the wounded added a realism that spectators did not soon forget.

Other developments soon followed: S.W. Alderson, inventor of the original aerospace crash-test dummies for NASA and the USAF, began producing “synthetic casualties” in the 1950s. These included a CPR dummy nicknamed “Joe Blow,” blood oozing moulages worn by soldiers during medical training, and human-like figures called medical phantoms used to measure exposure to radiation.

Major Innovations

Casualty realism in U.S. Army training improved significantly in mid-fifties, partly due to the vision and persistence of a certain LTC Vincent Hack. The Management of Mass Casualties Course, initiated in 1956, was designed to present methods for handling mass casualty scenarios generated by thermonuclear war. In these field demonstrations, called Operation BLOWUP, simulated casualties were simply given labels and were sorted as either litter patients, walking wounded, or able to assist as litter bearers and treated accordingly. Operation BLOWUP welcomed LTC Hack onboard the next year, and he quickly headed off to England to trade ideas with the British forces on the use of “training aids” in mass casualty scenarios.

Upon his return, Hack convinced MG William Shambora, commander of the Brooke Army Medical Center, to engage as many resources as possible in the staging of Operation BLOWUP. There was a simulated detonation of an atomic bomb, and one thousand tagged and simulated casualties were put into play during the field exercises.

Theatrical make up, moulaging, and staging was done in a manner to portray as much realism as possible. The simulation mimicked approximately 60 different types of wounds, from flash burns to amputations, observed in the aftermath of the Hiroshima and Nagasaki bombings. In some of the exercises, over 200 casualties were made-up for sorting and first-aid treatment, and the wounds exhibited such realism that it caused experienced physicians to think they were actual wounds.

In May of 1958, the simulated casualty known as “Bleeding Pete,” a life-sized medical manikin with various “injuries,” was used in training at the AMSS and was on display at the Armed Forces Day Open House at Kelly Air Force Base. A few months later, an experimental head and torso model manikin was developed through an Army research and development contract for the AMSS to teach mouth-to-mouth resuscitation.

Yet more accurate representations appeared at this time. A December 1957 article in the Fort Sam Houston post newspaper describes a manikin designed for practice inserting a tube into the trachea and a method of artificial respiration, used alone or in connection with the intubation, which appears to more efficient and more adaptable than any method previously used. Composed of an upper human torso with an exact duplication of the structure of the throat with a hinged lower jaw to simulate the mouth and
the airway channels branching from the pharynx, the models were used to instruct students in the technique of opening a passage before inserting a tube to ensure an unobstructed airway.

To broaden the simulation repertoire, a pilot model of an anthropomorphic manikin designed specifically for X-ray technician training arrived at BAMC for testing in 1959. Made out of plastic and other synthetic materials, it was the size of a 160-pound man and could be manipulated into approximately 400 different positions. Embedded in the synthetic flesh were plastic bones that would appear in the x-ray film.

Sometime between 1961 and 1963, PROTOTYPE MODEL 6910-M02-0001 (Male Body for First Aid Training) arrived at the MFSS. Designed specifically for the MFSS by S.W. Alderson, the synthetic casualty was the first portable medical training dummy with a variety of simulated wounds. The manikin could be operated independent of a base, allowing it to be placed in the field in about any position and had several interchangeable moulages through which fake blood was pumped.

**Back to the Future**

Simulation training for the Army Graduate Program in Anesthesia Nursing, ranked the best in the nation by U.S. News and World Report magazine, is perhaps the most sophisticated use of human patient simulators. Starting in 2006, the program developed simulations that focused on two main areas: general endotracheal anesthesia and regional anesthesia to be used in teaching and testing sessions. Today, refined simulation is integrated into didactic curriculum such as basic and advanced airway management, regional anesthesia, machine check, fundamentals of anesthesia, and pharmacology. The program also incorporates student-faculty simulation during monthly counseling and employs distinct categories of simulation: 1) Curriculum integration in at least 50 percent of fundamentals instruction; 2) performance counseling; 3) student work groups; and (4) testing.

Human-patient simulators and simulations are integrated into medical training from the classroom, to mobile training teams, to medical treatment facilities. The Mobile Obstetric Emergency Simulator, SimNewB, and Noelle are examples of simulators used in neonatal nursing training. MAJ Amber Pocrnich is currently stationed at Bayne-Jones Army Community Hospital in Louisiana and was recently reassigned from Tripler Army Medical Center where she served as the Clinical Nurse Officer in Charge of Labor and Delivery. She noted that that the use of simulators vastly improved desired skills and knowledge of students.

“In my department, we used the MOES trainer regularly,” Pocrnich said. “We mostly would use it on academic days for the Residency Program. It then evolved into team training and eventually we used the MOES for our Mass Transfusion Protocol Drills as well. My RN’s also used the MOES to validate skills needed when the High Risk/Low Volume OB Events occur such as shoulder dystocia, PP hemorrhage, and prolapsed cord.”

As a Neonatal Resuscitation Program certification regional trainer, Pocrnich utilized the SimNewB monthly for the Skills Stations required for certification. “Nearly all of the participants stated that they learned more from that hands-on portion than they ever had in years before,” she said. “We also conducted mock neonatal codes quarterly—and sometimes more often—utilizing the SimNewB.”

In the realm of simulation, the AMEDD Center and School Mission Training Complex provides mission command simulation training for exercising military decision making skills and digital mission staff training for leaders. The complex provides training support for mission planning and rehearsal and pre-deployment training support ranging from the platoon- to Combined Joint Task Forces (CJTF) levels. The MTC evaluates live, virtual, constructive, and gaming training development for AMEDD/MEDCOM operational readiness and supports the conduct of distributed simulation/stimulation training, utilizing virtual Avatar and Gaming technologies to support tailored training needs. Simulations and gaming examples include virtual battle space, tactical language training, tactical combat casualty care, stability and civil support operations, and logistics planning.

Today, medical training focuses on the use of task trainers, both partial and whole, that replicate the human and even veterinary medicine needs in physical and virtual formats; the use of serious games to address patient assessment; and even the teamwork required to successfully complete the medical mission.

More info: amedd.army.mil

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**PUBIC BONE**

**INGUINAL LIGAMENT**

**COMPRESSION ASSEMBLIES**

**Rear Pocket with Instruction Card**

**Compression Pad**

**Threaded T-Handle**

**Base Plate**

**Cord Lock**

**Tactical Toggle**

**Circumferential Compression Buttocks Pad**

**Heavy-Duty Buckle**

**Writeable Area**

**Adjustable Strap**

**Threaded T-Handle**

**Position Compression Pads 30° to Apex**

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