Advances in Army Medicine since 9/11

Army Medicine is one of the world's leading medical organizations. Support to military personnel on the battlefield, always the number 1 priority, requires significant ongoing research and development of medical materiel, training of personnel, and logistics of moving wounded or injured Soldiers.

The following is a brief discussion of advances in Army Medicine during the past 15 years. Although most of these advances came about as part of the effort to improve care for Soldiers, many have also had a great impact on the civilian medical sector.

Warrior Transition Units (WTU)

Warrior Transition Units aid in the recovery of severely wounded, injured and ill Soldiers as they transition to active duty or return to civilian life. WTU clinical social workers, nurse case managers, and squad leaders, in conjunction with the Soldier Family Assistance Center (SFAC) staff, reach out to Family members to assess their needs and to involve them as the Wounded Warrior works on his or her plan to transition to the next step in recovery. Army Medicine collaborates closely with the Veterans Health Administration to include Families in the healing process. More than 40,000 wounded, ill, or injured Soldiers and their Families have been helped.

Amputee Care

During the past 15 years, Army Medicine identified changes needed in the way we think about and care for Service Members who have lost limbs. The current approach to amputee rehabilitation uses a multidisciplinary approach in evaluating and treating the wounded Service Member. Acute care, rehabilitation, fitting for prosthetics (if needed), cardiovascular care, and improving fitness are steps in the process of recovery.

Pain Management

In 2009, the Army Pain Management Task Force spearheaded a comprehensive evaluation of pain management across Department of Defense, Veterans Administration, and civilian medicine. The Army's Comprehensive Pain Management Campaign Plan implemented the Task Force's 109 recommendations to provide holistic and interdisciplinary pain care that increases the number of treatment modalities and technologies and focuses on optimal quality of life for Soldiers and Families with acute and chronic pain. Army Medicine's pain management strategy serves as the foundation for the Department of Defense pain management strategy.

Comprehensive Behavioral Health System of Care (CBHSOC)

In 2010, the CBHSOC was established to standardize, synchronize, and coordinate behavioral health care across the Army and throughout the Army Force Generation cycle. The CBHSOC implemented routine behavioral health screening points for Soldiers and standardization of screening instruments. The CBHSOC developed a common behavioral health data system; implemented surveillance and data tracking capabilities to coordinate behavioral health clinical efforts; synchronized tele-behavioral health

activities; and integrated Reserve components. Coordination occurs with Veterans Affairs, the Defense Centers of Excellence, and the National Intrepid Center of Excellence for continuity of care.

Rapid Aeromedical Evacuation

Additional MEDEVAC companies deployed to theater during the height of conflict reduced evacuation times from 1 hour 40 minutes to 45 minutes, meeting the "golden hour" goal. The golden hour is the 60 minute period after trauma, after which the chances of survival for wounded Soldiers drop significantly. The addition of Flight Medics in MEDEVAC Companies and additional training has helped to improve survival rates.

Concussion Management

In 2010, Army Medicine implemented a new management strategy for mild Traumatic Brain Injury (TBI) to disseminate information that healthcare workers needed to improve care for TBI. This policy directed that any Soldier who sustained a mandatory reportable TBI exposure event must undergo a medical evaluation including a mandatory 24-hour downtime, followed by medical clearance before returning to duty. The mandatory events are a command-directed evaluation for any Soldier who sustains a direct blow to the head, is in a vehicle/building associated with a blast event, collision or rollover, or is within 50 meters of a blast. The Army and the DoD track these events to identify Soldiers at risk. Education and training efforts in the Army have led to increased awareness of TBI for the Soldier and increased screening for TBI by medical personnel.

Biomarkers to Identify TBI

The U.S Army Medical Research and Material Command (USAMRMC) has been studying blood biomarkers for TBI since 2001 to determine their utility in the diagnosis of severe, moderate and mild TBI. The goal of the program is to develop and deliver an FDA-approved assay for the diagnosis, screening, and management of TBI.

Wound Toxicity

The Armed Forces Institute of Pathology (now the Armed Forces Medical Examiner's Office) reduced the risk of toxicity among survivors of blast injuries through the analysis of retained metal fragments recovered during surgery. The chemical characterization of removed fragments is now part of the state-of-the-art medical evaluation and management of blast injuries. Providers can better treat wounded service members whose clinical recovery becomes complicated by antibiotic-resistant combat wound infections.

Regenerative Medicine and Burn Care

In 2008, DoD established the Armed Forces Institute of Regenerative Medicine to develop new products and therapies to treat severely injured service members. Regenerative medicine represents great potential for treating our wounded with debilitating, disabling and disfiguring extremity injuries and burns. The U.S. Army Institute of Surgical Research has developed methods for global critical care transport of burned patients by the Burn Flight team incorporating intensive care and ventilator

strategies. A modified resuscitation formula was developed to greatly simplify the calculating of prehospital Intravenous fluids for burn patients by medics.

Joint Trauma Analysis and Prevention of Injury in Combat (JTAPIC)

The JTAPIC program collects, integrates, and analyzes injury and operational data that enables improvements to prevent or mitigate blast-related injuries. One component, the Joint Trauma System allows analysis of battlefield injury information and has resulted in improved treatment in theater and substantially increased survivability rates. The Joint Forces have used the information provided by JTAPIC to change the way we protect our Warfighters from combat injuries, including modifications and upgrades to vehicle design and armor and fire suppression systems.

68W Health Care Specialist (Medic)

Army Medicine revised and expanded combat medical training in 2001 from 10 weeks to 16 weeks and created 68W Health Care Specialist Military Occupational Specialty (MOS). The new course includes extensive training in trauma medicine and mandatory certification as a National Registered Emergency Medical Technician; 1,360 additional medics were assigned to Brigade Combat Teams. This enhanced training, coupled with the use of the Combat Application Tourniquet and an increase in MEDEVAC companies to the inventory, has helped to improve the survivability rate of our combat wounded to greater than 90 percent.

Improved Individual First Aid Kit (IFAK)

Army Medicine has made huge advancements in first aid care. The Generation II Improved First Aid Kit increased individual Soldier capabilities to provide Self-Aid or Buddy-Aid and provides interventions for two leading causes of death on the battlefield, severe hemorrhage and inadequate airway. The treatment of battlefield wounds is exacerbated by the long evacuation times during military operations. Appropriate care on the battlefield ensures that injured Soldiers are able to give or receive timely care for injuries.

Combat Gauze Dressing

Because approximately 86 percent of all battlefield deaths occur within the first 30 minutes after wounding, the ability to stop hemorrhage is vital in caring for battlefield injuries. Combat Gauze has been developed, tested and fielded for hemorrhage control and is currently included in the IFAK. Combat Gauze quickly controls bleeding and protects wounds from debris and bacteria. Combat Gauze is impregnated with kaolin, which has excellent clotting properties. The gauze triggers the body's natural coagulation response. The Combat Gauze Dressing is easy to remove from wounds and greatly improves hemorrhage control.

Combat Application Tourniquet (CAT) and Junctional Tourniquets

Since World War II, nearly 50 percent of combat deaths have been due to blood loss. About half of combat deaths could be avoided if timely, appropriate care to stop bleeding had been available. Before 2005, tourniquets included the strap-and-buckle tourniquet that dated to the Civil War and the one-

handed tourniquet. Today, the CAT is the primary tourniquet issued to all Soldiers. No pre-hospital medical device has saved more lives than the CAT. In 2005, the CAT was honored as one of the Army's 10 Greatest Inventions. The junctional tourniquet is carried by all combat medics and used on the torso. The junctional tourniquet weighs about one pound, straps on a patient like a belt, and includes two inflatable air bladders that create pressure to stop blood loss.

Human Immunodeficiency Virus (HIV) Research

The Military HIV Research Program (MHRP) is at the forefront of the battle against HIV to protect U.S. troops from infection and to reduce the global impact of the disease. The U.S. Army sponsored an efficacy trial involving 16,0000 volunteers in Thailand that showed the vaccine regimen was modestly effective at preventing HIV infection. This study, called RV144, provided proof that an HIV vaccine is possible, which energized the research field and led to a new efficacy study with a similar vaccine in South Africa that will begin in late 2016. Time Magazine deemed this vaccine strategy the 2nd leading medical discovery of 2009 and no. 8 in Best Inventions of the year.

Electronic Health Record (EHR)

The EHR allows global access to beneficiary healthcare data in support of the health and medical readiness of Soldiers, Family Members, and retirees. Computerized Provider Order Entry allows drug interaction checks, allergy checks, provider alerts, and improved legibility of medication orders. These benefits have resulted in a significant decrease in mortality and improvement in patient safety. The EHR also allows Army Medical Department physicians to collect and analyze healthcare data to improve clinical outcomes.

Virtual Health

One of the most innovative lessons learned during the past 15 years of conflict is the value of virtual health. Army Medicine is a recognized leader in virtual health, also known as telehealth or telemedicine. Virtual health revolves around one concept − connect people to health care globally to increase readiness, access, quality, and patient safety. Using virtual health, the best capabilities of Army Medicine anywhere in the world can be brought to the patient wherever they are – deployed or in garrison. Army virtual health provides clinical services across 18 time zones in over 30 countries. From FY08 to FY15, Army virtual health provided approximately 200,000 clinical encounters—many for tele-behavioral health consultations, although the potential for virtual health in almost all specialties is being developed.

Vaccine Development

There have been 28 innovative vaccines licensed in the U.S. Of these 28, the U.S. military played a significant role in the development of 8: Rubella (1969), Adenovirus 4 & 7 vaccines (1980), Tetravalent meningococcal vaccine (1981), Hepatitis B vaccine (1981), Oral typhoid vaccine (1989), Japanese encephalitis vaccine (1992, 2008), and Hepatitis A vaccine (1995). Army Medicine also is a leading research partner in an effort to find vaccines for malaria.

Flight Medic Paramedic and Critical Care Program

The Army Medical Department Center and School has established a new Flight Medic Paramedic Transition Course and the Critical Care Clinical Skills Phase.

The AMEDDC&S and University of Texas Health Science Center at San Antonio (UTHSCSA) developed a partnership in November 2011 to establish the U.S. Army Flight Medic Paramedic Program.

This program was created to improve the quality of emergency en route care provided by Air Ambulance units in contingency operations and in the United States.

The Flight Medic Paramedic Transition Course is a 26-week program specifically designed for Soldiers assigned to Air Ambulance units. This program will enable flight medics to provide advanced critical en route care to trauma and medical patients and successfully prepare them to pass the National Registry Emergency Medical Technician-Paramedic (NREMT-P) examination. NREMT-P certification and sustainment will be a future requirement for all Flight Medics to be considered qualified in their field.

The Critical Care Clinical Skills Phase is a mandatory follow on 8-week course that provides flight medic candidates the critical care skills and experience to perform direct hands-on patient care.
The experiences in combat and domestic support operations have highlighted the need for the addition of advanced pre-hospital critical care skills to the medevac mission.

Analyses concluded a requirement exists to provide specialized advanced trauma management at or near the point of injury and thus improve patient outcomes.

These analyses also concluded the most appropriate course of action is certified paramedic flight medics with advanced critical care training

Currently, flight medics receive four weeks of training and they are trained at the EMY-Basic level. EMT –Basic is the training and certification all combat medics are required to achieve. EMT-paramedic is two levels more advanced.