

Advances in Trauma Care since 9/11

Extremity injuries are the leading cause of combat injury. Survivability from these often complex wounds has increased remarkably in recent conflicts, due to improved body armor; changes to combat tactics, techniques and procedures; and improvements in combat casualty care. Since 2001, 1,701 Service members survived conflict-related amputations and received their care in the Military Health System. Of these combat-related amputations, approximately 98% of the patients are male and 1,539 were between the ages of 20-29 at the time of their injury. Further, blast related injuries account for 92% of these amputations.

These severely injured Wounded Warriors represent significant medical, surgical, and rehabilitation challenges. Management of Service members with amputations or complex extremity injuries requires comprehensive, coordinated, and multidisciplinary health care teams throughout the continuum of care. These health care teams provide the leading practices in surgical/medical interventions, prosthetic and orthotic technology, and comprehensive rehabilitation management. This highly synchronized care ensures Service Members reach their optimal level of function, with the greatest opportunity to remain in uniform. Provided at one of three DoD Advanced Rehabilitation Centers (ARCs), this innovative care model was developed during the recent conflicts to meet the need for advanced, complex patient care and cutting-edge rehabilitation. This formalized system of specialized care and its processes for amputation care, management, and transition are best defined in the Care of the Combat Amputee, Textbooks of Military Medicine, published in 2009 by the Borden Institute. The DoD ARCs are operational at Walter Reed National Military Medical Center, Brooke Army Medical Center, and Naval Medical Center San Diego.

The state-of-the-art care in the ARCs resulted in unprecedented numbers of Service Members remaining on active duty and deploying following amputation. Partnership with industry was essential to advance prosthetic and orthotic technologies to achieve these results. Direct collaboration between the DoD and industry resulted in the development of the Genium® and X3 Military Hardened Prosthetic Knees. The Intrepid Dynamic Exoskeletal Orthosis (IDEO) was developed at the Center for the Intrepid (CFI) for Service Members with extremity trauma. Following a focused rehabilitation program, these Service Members are often able to run and perform complex, high impact activities.

The increasing number of Service members with devastating extremity trauma, advances in rehabilitation services and technologies, and significant research efforts within the VA and DoD, drove the need for a comprehensive plan and strategy. In 2009, Congress passed legislation to establish the Extremity Trauma and Amputation Center of Excellence (EACE). The EACE was tasked to advance the mitigation, treatment, and rehabilitation of extremity trauma and amputation. The EACE is the only Congressionally-mandated center of excellence which is jointly established between the DoD and VA. This joint organizational structure is designed to foster unprecedented collaboration and creates outstanding coordination for the benefit of patients. The EACE's collaborative partnerships with federal

institutions, academia, and industry facilitate focused research, informed clinical policy, and relevant knowledge products.

One key example of this is the DoD-VA Upper Extremity Amputation Rehabilitation (UEAR) CPG, published in 2014. This CPG was developed to reduce practice variance, enhance the standard of care, accelerate research translation into clinical practice, and improve health, quality of life, and patient satisfaction. Coordination, synchronization and integration by the EACE is essential to keeping care and support for our injured Service Members and Veterans at the highest level of clinical excellence and technological advancement. The EACE will continue to foster key initiatives specifically focused on revolutionizing extremity trauma and amputation care for Wounded Warriors and Veterans.