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ACTION ON INTEROPERABILITY OF MEDICAL DEVICES, DATA, AND PLATFORMS TO ENHANCE PATIENT CARE

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The mission of the Clinical and Rehabilitative Medicine Research Program within USAMRMC is to implement long-term strategies to develop knowledge and materiel products to reconstruct, rehabilitate, and provide definitive care for injured Service members. The ultimate goal is to return the Service member to duty and restore his/her quality of life. The Neuromusculoskeletal Injuries Program Area includes Department of Defense (DoD) research efforts directed towards optimal treatment, rehabilitation, and reintegration following service-related neuromusculoskeletal injury including: service-related acute and repetitive overuse injury management, limb loss rehabilitation and prosthetic management, and limb trauma rehabilitation and orthotic management.

A priority capability gap within the portfolio is Interoperable Systems, specifically a) The DoD lacks interoperable systems to optimize function, participation, and quality of life for patients with limb trauma and loss b) the DoD lacks evidence for the benefit of interoperable systems for patients with limb trauma and loss.

The DoD has had interest in the interoperability of prosthetic systems for some time, even contributing to a book dedicated to the subject (Tepe, Victoria & Peterson, Charles. (2017). Full Stride: Advancing the State of the Art in Lower Extremity Gait Systems: Designed for medical practitioners, engineers, students, and researchers who use or develop prosthetic technology for civilian or military amputees, Full Stride: Advancing the State of the Art in Lower Extremity Gait Systems will be of great interest to trauma specialists, orthopedists, rehabilitation specialists, nursing staff and physical therapists, as well as researchers and scientists who specialize in fields that shape and inform advanced prosthetic device development such as materials sciences, engineering (electrical, mechanical, biomedical), robotics, and human physiology.)

The goal of the Lower Extremity Gait System (LEGS) program is to bring about revolutionary technology advancement for the more than 80% of U.S. military amputees who have experienced lower extremity amputations resulting from their service in Operations Iraqi Freedom, Enduring Freedom, New Dawn (OIF/OEF/OND). Current industry paradigms focus primarily on evolutionary directional improvement instead of taking advantage of intersectional advancements possible through the integration of well-researched, developed, and readily available ideas and technologies in fields such as: Communications, Sensors, Materials, Power, Actuation, Neuroscience, and more. Such intersectional integration can rather easily bring about revolutionary technology innovation, resulting in significant and clinically relevant patient Quality of Life (QoL) improvements. USAMRMC/TATRC (Telemedicine and Advanced Technology Research Center) LEGS program fosters this effort by engaging with experts in a true disparate technologies integration program, similar to many robotics development programs by engaging with foundational and enabling technologies in areas such as neuroscience, materials, power and sensors, in collaboration with experts from the FDA, NIH, NASA, the VA, and top universities and research institutes domestic and abroad, as well as prosthetists, orthotists, and current major manufacturers.