



Peer Reviewed Orthopaedic Research Program

Over 126 million adults in the United States are affected by a musculoskeletal condition costing an average of \$7,800 per person for treatment.¹ Approximately 1.6 million musculoskeletal injuries occur each year within the Department of Defense (DoD) resulting in 2.4 million medical visits and \$548 million in direct patient care costs.^{2,3} A prospective cohort study of active duty US Army personnel representing various military units, including rangers, combat, combat support, and combat service support found that over half of the participants sustained a musculoskeletal injury during the 12 month study period. In addition, over half of all the injuries were located in the lower extremities and the greatest incidence of injuries and time loss were found in the combat support and combat service support units.³

VISION

Provide all Warriors affected by orthopaedic injuries sustained in the defense of our Constitution the opportunity for optimal recovery and restoration of function

MISSION

Address the most significant gaps in care for the leading burden of injury and for facilitating return-to-duty by funding innovative, high-impact, clinically relevant research to advance optimal treatment and rehabilitation from musculoskeletal injuries sustained during combat or combat-related activities in accordance with directives received from Congress

PROGRAM HISTORY

Over half of all combat injuries sustained during Operation Iraqi Freedom and Operation Enduring Freedom involve extremity injuries and orthopaedic-specific conditions secondary to battle injury, representing the largest source of long-term disability in returning Service members.⁴

Orthopaedic injuries sustained during combat-related activities tend to be distinct from those seen in the civilian setting and more frequently involve multiple limb trauma, open fractures, major tissue loss, and a high degree of wound contamination.

Since its inception in 2009, the DoD Peer Reviewed Orthopaedic Research Program (PRORP) has dedicated its Congressional appropriations, totaling \$368.5 million, to supporting military-relevant orthopaedic research that also benefits the treatment and care of the general population. The PRORP has funded 255 projects to date that have focused research on topics including prevention, treatment, rehabilitation, and prosthetics/orthotics.

SAMPLE ADVANCES SUPPORTED BY THE PRORP

- Development of a surgical technique, targeted muscle reinnervation, to facilitate intuitive control of myoelectric prosthetic devices and reduce common amputation-related pain caused by phantom limb syndrome and neuroma at the amputation site.
- Creation of a vacuum-assisted prosthetic socket, the NU-FlexSIV socket, to enhance prosthetic care and performance for transfemoral amputees.
- Determination that induction of heterotopic ossification (HO) can be facilitated by bone growth signals secreted from peripheral nerves adjacent to the site of HO.
- Optimization of peripheral nerve outgrowth following traumatic injury using a novel nerve conduit with a diffusion-controlled drug reservoir to stimulate nerve regeneration.

¹ The Bone and Joint Initiative. "By the Numbers: Musculoskeletal Conditions - Diseases, Disorders, and Injuries Relating to Bones, Joints, and Muscles." <https://www.aaos.org/Govern/Federal/CapHill/Numbers.pdf>

² Hauret KG, et al. (2010) *American Journal of Preventative Medicine* 38(1S) S61-S70.

³ Teyhen DS, et al. (2018) *Journal of Orthopaedic and Sports Physical Therapy*. 48(10) 749-756.

⁴ Cross JD, et al. (2011) *J Am Acad Orthop Surg*; 19:S1-S7.

The PRORP has initiated two large clinical consortia to bring military patients, leading researchers, and clinicians together with top civilian organizations and infrastructure to form durable partnerships and provide new solutions along the continuum of care for wounded Service members with orthopaedic injuries.

MAJOR EXTREMITY TRAUMA AND REHABILITATION CONSORTIUM (METRC)

- The METRC’s mission is to provide the evidence needed to establish better treatment guidelines for optimal care of the wounded Warrior and to improve the clinical, functional, and quality-of-life outcomes of Service members and civilians who sustain high-energy trauma to the extremities.
- Clinical studies are focused in six core areas, including bone defect reconstruction and fracture healing, acute and chronic wound infection, compartment syndrome, limb salvage and amputation outcomes, post-acute care and -rehabilitation outcomes, and wound care and closure.
- Since inception METRC has supported more than 30 clinical trials, and disseminated important advances widely among the traumatology community

BRIDGING ADVANCED DEVELOPMENTS FOR EXCEPTIONAL REHABILITATION (BADER) CONSORTIUM

- The BADER Consortium aims to improve the quality of life for Warfighters who suffer significant limb injuries in combat through orthopaedic rehabilitation research conducted at several military and civilian research institutions across the country.
- Research priority areas include community reintegration and return to work/duty; functional outcomes for individuals with upper-extremity trauma; and returning patients with lower extremity trauma to running, jumping, and agility activities.
- Since inception, studies being conducted by the BADER Consortium have produced 15 publications from eight clinical trials

PRORP COMMITMENT TO ORTHOPAEDIC RESEARCH

The PRORP is uniquely positioned to address treatment and knowledge gaps in the care of Service members and Veterans that have sustained a significant orthopaedic injury. Alongside scientists and clinicians, active duty Service members and retired Veterans who have treated or sustained orthopaedic injuries themselves serve on the Program’s Peer and Programmatic Review Panels, allowing for their equal voice in determining the Program’s investments in research that will have a real impact on the orthopaedic patient community. Their input has helped focus the Program’s efforts. As such, the PRORP has supported orthopaedic research across the 11 research areas shown in Figure 1, which have resulted in the advancement of novel interventions to treat traumatic extremity injuries, impacting the current standard of care for treating Service members, Veterans, and the general public.

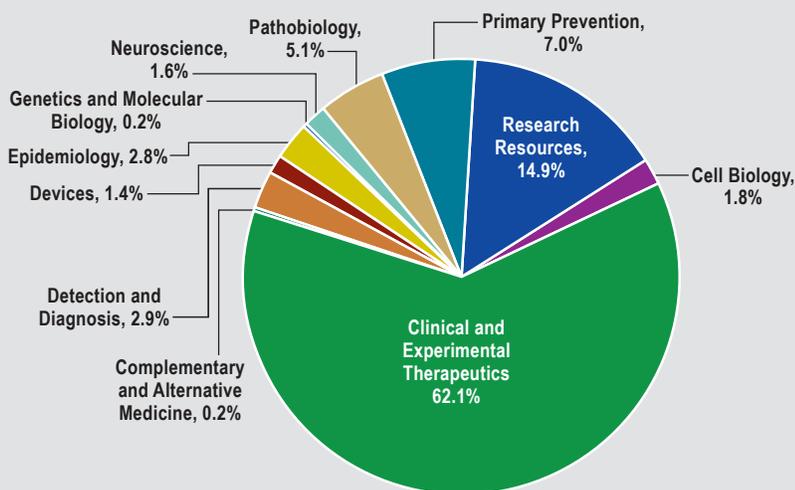


Figure 1. PRORP Awards by Scientific Classification



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