

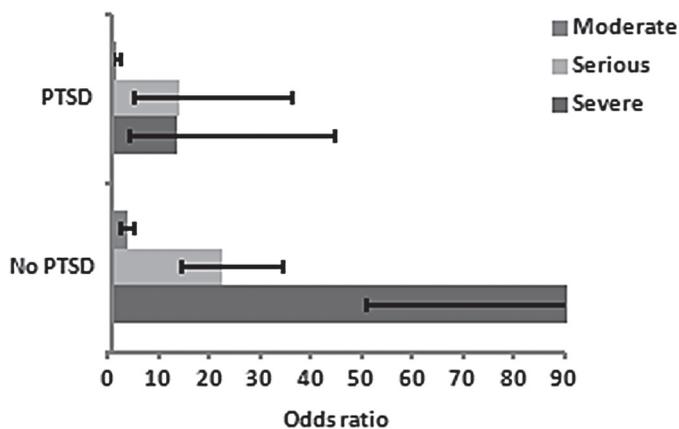
Report of traumatic brain injury information sources among OIF/OEF Veterans undergoing polytrauma evaluations

Robert J. Spencer, PhD, et al.

Servicemembers returning from battle frequently report symptoms of traumatic brain injury (TBI). Information regarding potential symptoms of TBI is available from multiple sources. The symptom presentation of Veterans may be significantly influenced by this information. A sample of Veterans suspected of having sustained head trauma were asked about the sources of information they have encountered regarding TBI. “Friends in the military” was the most frequently cited source of information, followed by the Internet, medical professionals, and informational pamphlets. This survey indicates that Veterans are usually exposed to multiple sources of information about TBI prior to a formal medical evaluation.

Combat blast injuries: Injury severity and posttraumatic stress disorder interaction on career outcomes in male servicemembers

Susan L. Eskridge, PT, PhD, et al.

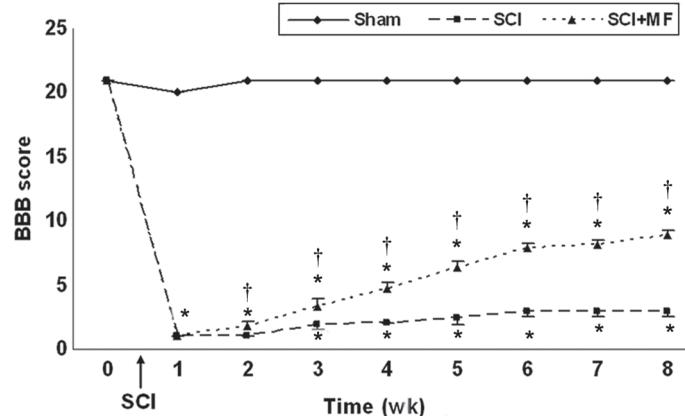


Blast injuries are now the most common wounds our warfighters face. This study describes career performance outcomes after combat blast injuries and ex-

amines the relationship between injury severity and the type of service discharge. Adverse career performance outcomes proportions were higher in servicemembers with a posttraumatic stress disorder (PTSD) diagnosis. Initial injury severity was associated with adverse career performance outcomes, which varied depending on PTSD diagnosis status. Findings from this study facilitate a better understanding of the role that injury severity and PTSD diagnosis have on functional outcomes in servicemembers injured by blasts.

Effect of extremely low frequency magnetic field in prevention of spinal cord injury-induced osteoporosis

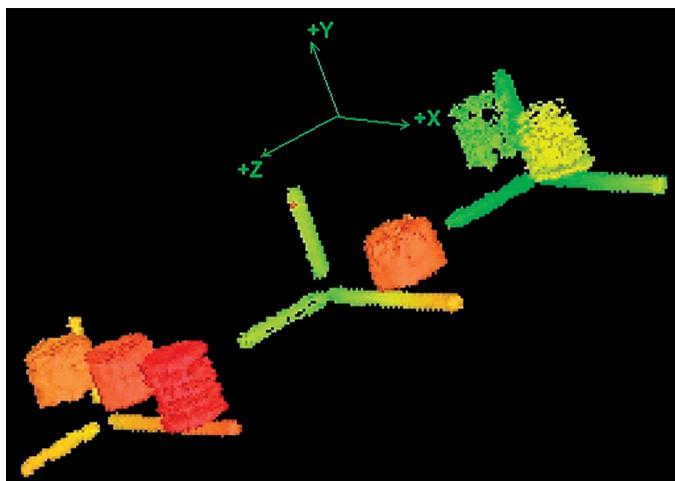
Jayanand Manjhi, PhD, et al.



Spinal cord injury (SCI)-induced osteoporosis is reported as one of the most rapid and severe forms of osteoporosis. Electromagnetic stimulation has shown to be effective in aiding bone healing in a variety of orthopedic conditions and provides a base of benefits for osteoporosis therapy. We report the efficacy of extremely low frequency magnetic field (ELF-MF) on SCI-induced bone loss. Our results suggest that chronic (2 h/d × 8 wk) exposure to ELF-MF is effective in attenuating SCI-induced osteoporosis.

Examination of anticipated chemical shift and shape distortion effect on materials commonly used in prosthetic socket fabrication when measured using MRI: A validation study

Mohammad Reza Safari, PhD, et al.



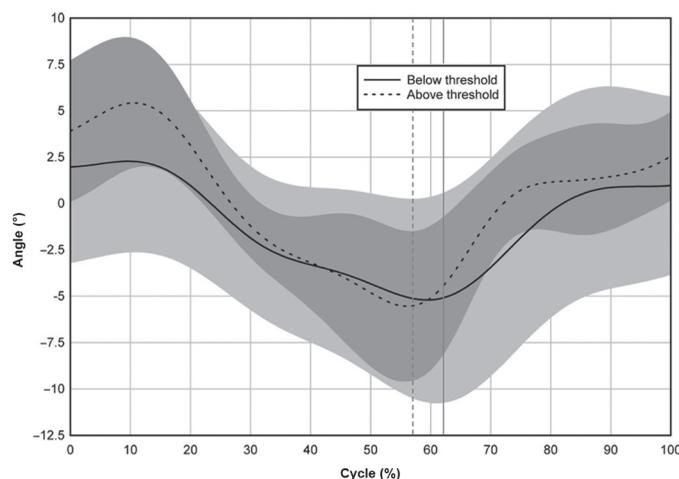
The quality of lower-limb prosthetic socket fit is influenced by shape and volume consistency during the residual limb shape-capturing process (i.e., casting). Casting can be quantified with magnetic resonance imaging (MRI) technology. We investigated the repeatability of MRI, the chemical shift artifact, and image distortion of seven different commonly used prosthetic materials in MRI images. The results show that MRI is an accurate and repeatable method for dimensional measurement when using matter containing water. Additionally, silicone and plaster of paris plus 1 g/L copper sulfate do not show a significant shape distortion or interfere with the MRI image of the residual limb.

Mechanical and biomechanical analysis of a linear piston design for angular-velocity-based orthotic control

Edward D. Lemaire, PhD, et al.

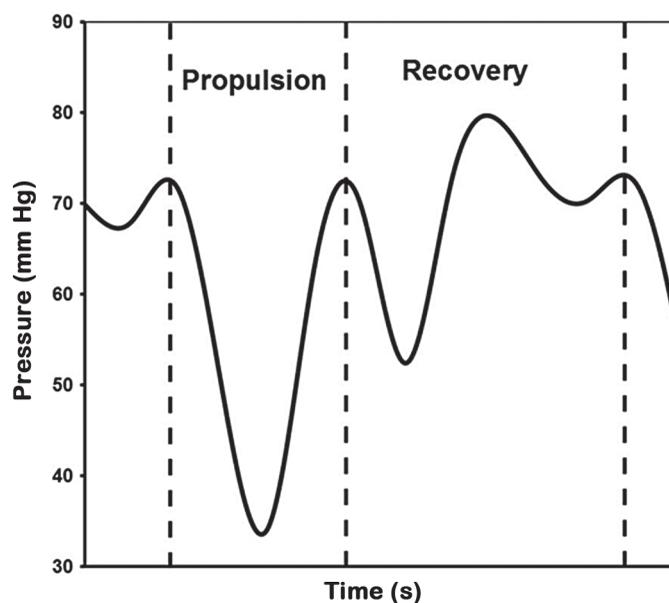
An orthotic knee joint was developed that uses knee-flexion speed to control when the joint engages to stop the knee from collapsing. This angular-velocity-based control joint uses a lightweight hydraulic design and could be used in both knee and knee-ankle-foot orthoses. Veterans with isolated knee-extension weakness, from trauma or neuromuscular

disease, would benefit by being able to walk normally with a mechanical joint that stops the knee from potentially collapsing during knee-collapse events when performing activities of daily living or walking.



Can static interface pressure mapping be used to rank pressure-redistributing cushions for active wheelchair users?

James Hollington, MSc; Susan J. Hillman, MSc



When selecting a pressure-relieving cushion for a wheelchair user, clinicians often use a mat of pressure sensors to judge which cushion is best for the user. These pressure measurements are almost always taken when the wheelchair user is sitting still rather than moving,

e.g., when manually propelling his or her wheelchair. This study investigated whether there is any difference between ranking the pressure-relieving qualities of cushions when users are sitting still (static) and when they are propelling (dynamic). The results suggest that cushions selected using static pressure measurements can be used for self-propelling wheelchair users.

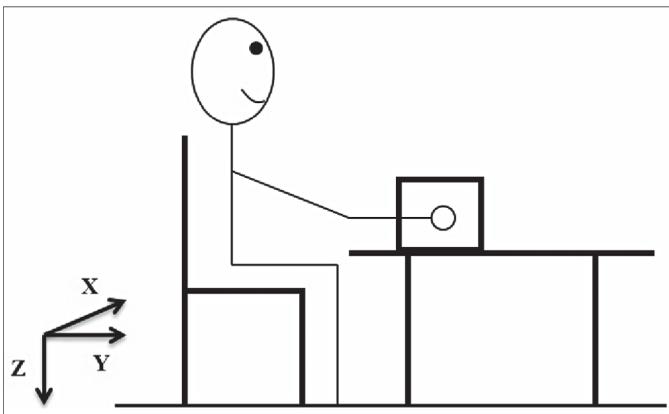
Use of powered mobile arm supports by people with neuromuscular conditions

Arun Kumar, MSc, BSc; Margaret Frances Phillips, MD

This study sought to understand the experiences of people with muscle conditions who use powered mobile arm supports. The most common muscle conditions affect 22 in every 100,000 people. We interviewed people who were 12 years and older about the use of their mobile arm supports and found that powered mobile arm supports positively influenced psychological factors, social participation, and independence in many activities. We identified several ways in which provision of, or the equipment itself, could be improved. This study highlighted how mobile arm supports can improve independence and lifestyles for individuals with arm weakness and their families.

Compensatory arm reaching strategies after stroke: Induced position analysis

Wei Liu, PhD, et al.

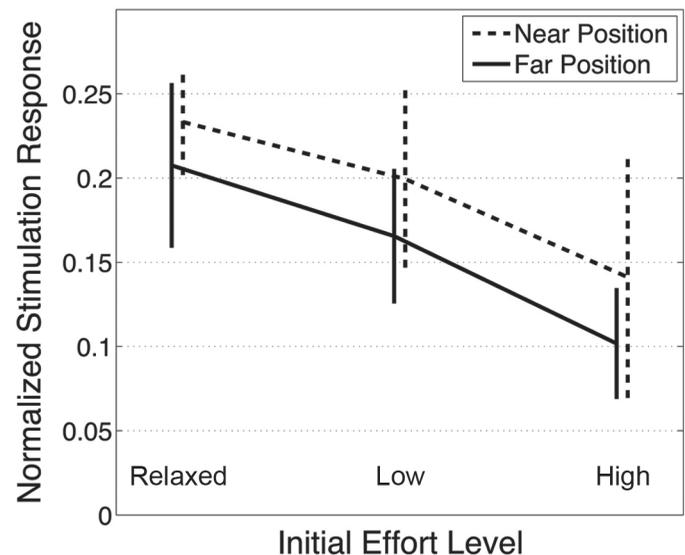


Stroke is the leading cause of adult disability in the United States. Over 795,000 Americans sustain a new

or recurrent stroke each year. Americans paid about \$73.7 billion in 2010 for stroke-related medical costs and disability. We proposed induced position analysis as a useful technique to look at basic motor function. This technique has not yet been utilized in functional arm reaching in stroke. We found that increased shoulder relative to elbow moment contribution was associated with less impairment and greater posttraining gains in speed of functional tasks.

Interaction of poststroke voluntary effort and functional neuromuscular electrical stimulation

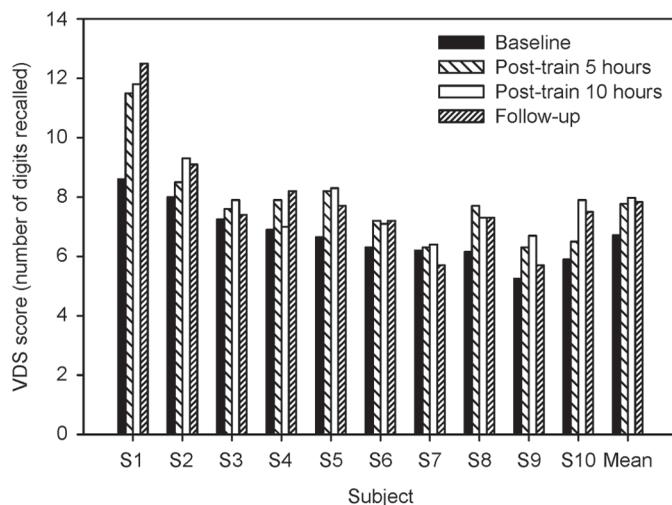
Nathaniel Makowski, et al.



Functional electrical stimulation from a neuroprosthesis in concert with voluntary effort may improve arm and hand movement after stroke. In order for this technique to be useful, we must know how the forces from voluntary effort and stimulation add together. In other words, does the stimulation response change if the user is relaxed or pushing hard? Our results indicate that if the user pushes harder, he or she receives a smaller increase in force as a result of the stimulation. This indicates that it may be advantageous to moderate effort when using a poststroke neuroprosthesis, allowing the stimulation to have a greater effect.

Minimal effects of visual memory training on auditory performance of adult cochlear implant users

Sandra I. Oba, MS, et al.

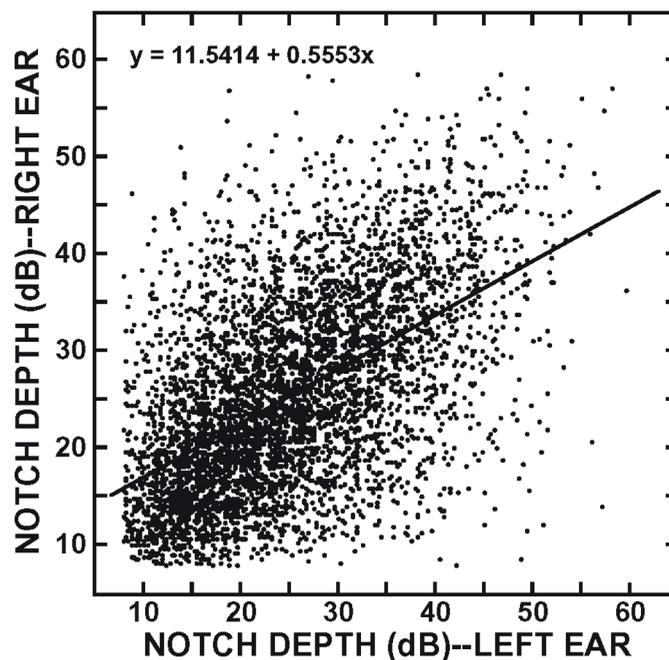


Auditory training has been shown to improve speech and music perception for cochlear implant users. It is unclear whether nonauditory training might provide similar improvements in auditory perception. In this study, speech and music perception, as well as auditory and visual memory, were assessed in cochlear implant users before and after training with a nonauditory task. With the nonauditory training, there were negligible gains in auditory performance, suggesting that cognitive learning did not drive the positive training outcomes in previous studies. Cochlear implant users may require targeted auditory training to maximize speech understanding.

Characteristics of the audiometric 4,000 Hz notch (744,553 veterans) and the 3,000, 4,000, and 6,000 Hz notches (539,932 veterans)

Richard H. Wilson, PhD; Rachel McArdle, PhD

This report is based on the audiogram database maintained at the Department of Veterans Affairs Denver Acquisition and Logistics Center. We evaluated audiograms from more than 1 million veterans, focusing on the dip in the audiogram (poorer hearing) that occurs in the high pitch range where hearing loss is often



thought to first occur. The important findings were that more individuals had poorer hearing in one ear than in both ears. Slightly more people had these dips in the left ear than in the right ear.

Comparing routine neurorehabilitation program with trunk exercises based on Bobath concept in multiple sclerosis: Pilot study

Ilke Keser, PhD, PT, et al.

This study compared trunk exercises based on the Bobath concept with routine neurorehabilitation approaches for patients with multiple sclerosis (MS). Three days a week for eight weeks, participants with MS performed either trunk exercises based on the Bobath concept (experimental group) or routine neurorehabilitation exercises (control group). Both groups also performed balance and coordination exercises. All patients were evaluated with the Trunk Impairment Scale, Berg Balance Scale, International Cooperative Ataxia Rating Scale, and Multiple Sclerosis Functional Composite before and after the program. The results showed that the Bobath-based exercises were as effective as the routine neurorehabilitation exercises. Therefore, trunk exercises based on the Bobath concept can be beneficial in MS rehabilitation programs.