JRRD at a Glance

Traumatic brain injury, posttraumatic stress disorder, and pain diagnoses in OIF/OEF/OND Veterans

David X. Cifu, MD, et al.

We looked at records of 613,391 Veterans from the OIF/OEF/OND wars who used Veterans Health Administration care at least once from fiscal years 2009 to 2011 to identify the prevalence of traumatic brain injury (TBI), posttraumatic stress disorder (PTSD), and pain. Of the Veterans, 9.6% were diagnosed with TBI, 29.3% with PTSD, and 40.2% with pain. The full polytrauma expression of all three diagnoses was 6.0%. Of those Veterans with a TBI diagnosis, the majority had a mental health disorder, with nearly half having both PTSD and pain.

http://dx.doi.org/10.1682/JRRD.2013.01.0006

Association of vitamin deficiency, secondary hyperparathyroidism, and heterotopic ossification in spinal cord injury

Christina V. Oleson, MD, et al.

Persons with spinal cord injury (SCI) are at increased risk of vitamin D deficiency, abnormalities in parathyroid hormone, and heterotopic bone formation. The purpose of this study was to explore the relationships among these conditions. We studied 96 patients with SCI and found an increased risk of elevated parathyroid hormone with deficient vitamin D. Furthermore, the presence of elevated parathyroid hormone led to risk of heterotopic bone formation. Abnormal bone formation in joints such as the hip or knee can contribute to pain and decreased mobility in patients with SCI.

http://dx.doi.org/10.1682/JRRD.2012.11.0206

Size of kinematic error affects retention of locomotor adaptation in human spinal cord injury

Sheng-Che Yen, PT, PhD, et al.

We identified the relationship between error size and the aftereffect retention in subjects with incomplete spinal cord injury (SCI) during locomotor training. We observed that subjects tended to make larger errors when the resistance load was greater. Following resistance load release, subjects showed an aftereffect consisting of an increase in stride length. Further, the aftereffect was retained longer in the medium-resistance load condition than in the heavy- and light-resistance load conditions. This finding suggests that a patient-specific resistance load condition may be needed to facilitate retention of locomotor adaptation in patients with incomplete SCI.

http://dx.doi.org/10.1682/JRRD.2012.09.0175

Classifying prosthetic use via accelerometry in persons with transtibial amputations

Morgan T. Redfield, MSEE, et al.

We developed a system to identify when a person with limb loss was wearing his or her prosthesis and whether he or she was moving, standing, or sitting. The system uses a commercially available accelerometer (sensor) and custom processing software. We tested the system in the laboratory by comparing results with visual observations of subjects and outside the laboratory by comparing results obtained from two sensors. The system accuracy averaged 96.6%. The information provided by this system may be useful to clinicians who are fitting prostheses, selecting components, or training patients. It may also be useful for automatic feedback control to adjust prosthesis mechanisms based on activity and posture.

http://dx.doi.org/10.1682/JRRD.2012.12.0233

Upper-limb activity in adults: Referent values using accelerometry

Ryan R. Bailey, MSOT, OTR/L; Catherine E. Lang, PT, PhD

Veterans who experience impairment to the arms after an injury or illness can benefit from rehabilitation. Our research provides a value of average amount of arm activity that occurs in adults that was obtained from a large sample of adults without arm impairment. We also explored the relationship between arm activity and conditions known to affect physical activity that could also affect arm activity. This information can be used by patients and therapists to set outcome goals and to track progress during rehabilitation of the arms.

http://dx.doi.org/10.1682/JRRD.2012.12.0222

Effect of oculomotor rehabilitation on vergence responsivity in mild traumatic brain injury

Preethi Thiagarajan, BS Optom, MS, PhD; Kenneth J. Ciuffreda, OD, PhD

Vergence eye movement rehabilitation was performed in 12 individuals with mild traumatic brain injury who had oculomotor-based reading problems. Vergence eye movement parameters were assessed before and after the oculomotor rehabilitation. Following oculomotor training, most vergence parameters significantly improved and/or normalized. In addition, nearwork-related symptoms were reduced and visual attention improved. No improvement was found following placebo training. The findings suggest the presence of considerable residual neurovisual plasticity in these individuals.

http://dx.doi.org/10.1682/JRRD.2012.12.0235

Transfemoral sockets with vacuum-assisted suspension comparison of hip kinematics, socket position, contact pressure, and preference: Ischial containment versus brimless

Jason T. Kahle, MSMS, CPO, FAAOP; M. Jason Highsmith, PT, DPT, PhD, CP, FAAOP

Nine people with transfemoral (above-knee) amputation tried two different socket types that both used a vacuum as the method of suspension. One type of socket had traditional high trim lines, which includes the perineum. The trim lines on the other type of socket were well below the perineum. X-ray was used to measure how these lower trim lines would affect the femur and the movement of the socket during weight and non-weight bearing. Skin pressure was also measured. Finally, all the subjects were asked which socket they preferred. The results showed no difference between the two sockets in the effect on the femur and socket movement. However, skin pressure was improved and all of the subjects preferred the socket with the shorter trim lines. The implications of this study were that vacuum suspension may assist in a more comfortable brim socket design for people with above-knee amputation.

http://dx.doi.org/10.1682/JRRD.2013.01.0003

Design and evaluation of two different finger concepts for body-powered prosthetic hand

Gerwin Smit, MSc, PhD, et al.

Current body-powered (BP) prosthetic hands have stiff fingers and require a large amount of input energy by the prosthesis user to produce a limited pinch force at the fingertip. Two new finger prototypes were designed, constructed, and evaluated. One finger was driven by a pulley and a cable; the other was driven by a hydraulic cylinder. The fingers enable the construction of an articulating BP prosthetic hand that is lighter, can pinch harder, and has a higher energy efficiency than current BP

prosthetic hands. Of both tested fingers, the hydraulic cylinder finger is the most suitable because it requires less input energy.
http://dx.doi.org/10.1682/JRRD.2012.12.0223

Determinants of postsurgical discharge setting for male hip fracture patients

Matthew L. Maciejewski, PhD, et al.

Veterans hospitalized for hip fracture are discharged to a range of settings for rehabilitation and care, but the factors that influence postsurgical discharge setting are not well documented. The purpose of the study was to examine the patient, facility, and market factors that influence the choice of postsurgical discharge setting. The Department of Veterans Affairs (VA) offers a comprehensive spectrum of rehabilitation care for veterans eligible for surgical treatment in VA facilities, so examining patterns of postacute care setting choice for a prevalent type of surgery provides unique data to inform clinical and policy discussions.
http://dx.doi.org/10.1682/JRRD.2013.02.0041

Circumstances and consequences of falls among people with chronic stroke

Arlene A. Schmid, PhD, OTR, et al.

People are at great risk for falls after chronic stroke. However, the reason for falls and consequences are not well known or understood. We found that falls occurred during activity and mobility as expected, but also were due to impaired mental and physical states, i.e., forgetting to tie a shoe or to use an assistive device. The falls in this study were related to high medical utilization and a large number of injuries. Prevention of falls may require self-management of such multiple risk factors coupled with physical activity.
http://dx.doi.org/10.1682/JRRD.2012.11.0215

Power mobility with collision avoidance for older adults: User, caregiver, and prescriber perspectives

Rosalie H. Wang, BSc (OT), PhD, et al.

Collision avoidance technology may make power wheelchairs and scooters safer for use by people with age-related changes or injuries resulting in physical, sensory, and cognitive disabilities. Much technology has been in development, but little is known about how consumers feel about this technology. As such, we interviewed power mobility users, caregivers, and prescribers (occupational therapists) to see how they feel about the design and usefulness of collision avoidance. They identified several safety and driving concerns that may be addressed by collision avoidance. Understanding consumers' views can help make future technology more beneficial and acceptable.
http://dx.doi.org/10.1682/JRRD.2012.10.0181

Depression and experience of vision loss in group of adults in rehabilitation setting: Mixed-methods pilot study

Hugo Senra, PhD, et al.

This study contributes to the understanding of depression in adults with irreversible vision loss. The goal was to provide new insights into the relationship between young and middle-aged adults' experiences of vision loss and depression. Such insights could explain why some patients with vision loss are more likely to be depressed and have more problems coping. The current findings highlight the potential role of patients' self-awareness of impairment, perceived social support, and length of rehabilitation in depression after vision loss. It is suggested that emotion-focused coping might also be adaptive, not just a sign of maladjustment as other research has shown.
http://dx.doi.org/10.1682/JRRD.2012.08.0138