JRRD at a Glance

Factors associated with neurocognitive performance in OIF/OEF servicemembers with postconcussive complaints in postdeployment clinical settings

Douglas B. Cooper, PhD, et al.

Cognitive difficulties are commonly reported in servicemembers with a history of mild traumatic brain injury following combat deployments, but many questions remain about which factors (for example, combat stress, blast exposure, pain) cause these difficulties. Correctly identifying which factors (or combinations of factors) cause the cognitive difficulties can help researchers develop more effective treatments for individuals in postdeployment settings. Our study found that effort and symptom complaints were most associated with cognitive difficulties. These results underscore the importance of assessing effort in the comprehensive evaluation of postdeployment conditions.

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Depression, posttraumatic stress disorder, and grade point average among student servicemembers and veterans

Craig J. Bryan, PsyD, ABPP, et al.

We surveyed 422 military personnel and veterans enrolled in college courses at universities across the United States during the 2012/2013 academic year. Military personnel and veterans reporting more severe depression and posttraumatic stress disorder (PTSD) symptoms also reported lower grade point average (GPA). Depression had a relatively stronger relationship with GPA than PTSD. The relationship of depression with GPA was explained by higher rates of failing exams. Student servicemembers and veterans tend to have lower GPAs because they fail exams more frequently.

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Effects of hyperbaric oxygen on eye tracking abnormalities in males after mild traumatic brain injury

David X. Cifu, MD, et al.

Sixty Marines with ongoing symptoms and abnormal eye movements after a combat-related concussion were treated for 2 mo with either one of two doses of hyperbaric oxygen or a sham treatment. The Marines' eye movements were tested before and after the treatments. There were no improvements in the Marines' eye movements in any of the three groups. Hyperbaric oxygen has no effect on abnormal eye movements after concussion.

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Changes in cognition and continence as predictors of rehabilitation outcomes in individuals with severe traumatic brain injury

David S. Kushner, MD; Doug Johnson-Greene, PhD

Uncertainty regarding long-term outcome expectations is a source of significant anguish to the families of veterans and civilians with recent severe traumatic brain injuries. There continues to be much controversy regarding factors during initial hospital care and inpatient rehabilitation that may be helpful in the prediction of recovery. This study investigates improvements in urinary and bowel continence as well as cognition by discharge from inpatient rehabilitation in nine patients who recovered independence by 8 to 15 mo after initial trauma. The results suggest that improvements in cognition twice the national average on the Functional Independence Measure and the recovery of bowel and bladder continence by discharge from inpatient rehabilitation may be associated with favorable long-term recoveries.

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Two-week virtual reality training for dementia: Single-case feasibility study

Daniel McEwen, MSc, et al.

Veterans with dementia are at risk for losing strength, mobility, and the ability to perform day to day activities. Virtual reality (VR) games have been used to encourage exercise in various populations; however, they have not been studied with veterans with dementia. This study investigated whether it was possible to do a VR training exercise program with a veteran with dementia. Our VR exercise program was found to be a feasible, safe, and enjoyable activity. However, our participant's mobility scores did not improve. In the future, larger studies may further validate the use of VR games as physical exercise in this population.

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Forward stair descent with hybrid neuroprosthesis after paralysis: Single case study demonstrating feasibility

Thomas C. Bulea, PhD, et al.

This work will benefit individuals with lower-limb paralysis from spinal cord injury. A new intervention for restoring mobility to a person with a thoracic-level injury is presented. The device combines an implanted electrical stimulation system with an external, controllable brace. This study demonstrates that it is possible to descend stairs using electrically stimulated muscles with this new intervention. Future work will focus on improving the system to enable more consistent and reliable stair descent with an aim toward restoring seamless mobility for individuals with lower-limb paralysis.

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Advantages of externally powered prosthesis with feedback system using pseudo-cineplasty

Seiji Nambu, MD, et al.

People with upper-limb amputation require new arms. However, currently available electrical-powered prosthetic arms are difficult to use because of a lack of sensory feedback. We therefore designed a simple control and feedback system using a human-machine interface attached to a forearm tendon, based on the idea of cineplasty. We investigated the ability to determine the size of objects grasped by a robotic hand in the absence of visual information. The subject could distinguish between large and small objects with 100% accuracy and between small, medium, and large objects with 80% accuracy. This technique allows only partial sensory feedback but appears to offer several advantages over other human-machine interfaces.

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Survival of male patients with spinal cord injury after cardiac arrest in Department of Veterans Affairs hospital: Pilot study

Deborah Caruso, MD, et al.

Survival after in-hospital cardiopulmonary resuscitation (CPR) is low in the general population. For patients with spinal cord injury, the likelihood of survival after CPR is unknown. Having this information may be useful for discussions of advanced care planning between physicians and patients. We reviewed cases of CPR among patients in a spinal cord injury unit at a Department of Veterans Affairs hospital. Survival was low, with only 2 of 36 patients leaving the hospital. No clear pattern was seen in patient characteristics. However, our conclusions are limited by the small sample size.

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Novel mouse model of spinal cord injury-induced heterotopic ossification

Heejae Kang, BA, et al.

Heterotopic ossification develops in about 20 to 30 percent of veteran patients with spinal cord injury from the conflicts in the Middle East and significantly impairs their rehabilitation. To date, no effective prevention and treatment exists for this disease. The goal of this study was to develop a novel small animal model of spinal cord injury-induced heterotopic ossification, which will serve as a powerful tool in exploring the molecular mechanisms and developing novel treatments for this disease, thus improving healthcare for veterans.

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Reduction of residual limb volume in people with transtibial amputation

Audrey T. Tantua, MD, et al.

An adequate prosthesis fit is important for rehabilitation of people with transtibial amputation. They function better in all aspects of daily life than those who have fitting problems with their prosthesis socket. Residual limb volume changes a lot in the postoperative phase. Therefore, it is important to measure residual limb volume in order to time a definitive prosthesis accurately. The aim of this study was to analyze the reduction of residual limb volume in the postoperative phase in order to facilitate prosthesis prescription.

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Perceptual and instrumental assessments of orofacial muscle tone in dysarthric and normal speakers

Angela M. Dietsch, PhD, et al.

Patients who have experienced traumatic brain injury and stroke are common in military as well as civilian hospitals. These patients are referred regularly to speech-language pathology services for thorough, objective evaluation of their speech and swallowing mechanisms. Research is needed to develop and validate the tools and procedures of speech-language pathology assessment and intervention. Such methods will allow speech-language pathologists to better document changes over time that might occur with disease progression, disuse atrophy, or therapeutic intervention. We present several studies on the development of a method for the objective evaluation of muscle tone in orofacial muscles.

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Comprehensive versus consultative rehabilitation services postacute stroke: Outcomes differ

Margaret G. Stineman, MD, et al.

Benefits of comprehensive stroke unit care are clear from the European literature, but the effectiveness of comprehensive services on dedicated bed sections during acute hospitalization as practiced in the United States is not well established. This study of almost 3,000 veterans found that patients with stroke who received comprehensive rehabilitation had higher gains of physical and cognitive independence and improved likelihoods of home discharge and 1 yr survival. These findings can have implications for the care of patients with stroke in the Veterans Health Administration. Further evidence is needed to identify those conditions where comparative evidence supports comprehensive rehabilitation.

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Validity and reliability of rectus femoris ultrasound measurements: Comparison of curved-array and linear-array transducers

Kendra Hammond, MD, et al.

Our veteran population is at increased risk of developing reduced muscle dimensions because of aging or chronic or acute illnesses. Decreased

muscle dimensions, particularly of locomotor muscles like the rectus femoris, are linked to increased illness and death. We provide the first demonstration that measurements of rectus femoris cross-sectional area in nondisabled subjects and elderly veterans obtained with a curved-array transducer connected to an inexpensive hand-carried ultrasound unit are valid, reliable, and reproducible. These results led us to contend that this technique is suitable for cross-sectional and longitudinal studies.

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Vision-based approach for long-term mobility monitoring: Single case study following total hip replacement

Elham Dolatabadi, MSc, et al.

This article presents a single-case study on the feasibility of using a low-cost and portable tool to monitor balance and mobility parameters before and after a surgery. Two different functional tasks—walking and sit-to-stand—were recorded with a Kinect sensor in the home and custom-made algorithms were developed to process the recorded tasks. This study has significant value for adults with either mobility limitation or balance problem after age-related incidents or any physical injuries. It will promote positive and supportive care through reducing fall risk and clinic visits and maximizing independence.

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