

JRRD At A Glance Podcast Episode 40

Listen to the JRRD At a Glance Podcast Episode 40: Discussing Traumatic brain injury, postacute stroke rehabilitation, mobility monitoring, and more from JRRD Volume 51, Number 7, 2014.

[Johanna Gribble]: This is episode 40 of the JRRD podcast for volume 51, issue 7, produced by the Journal of Rehabilitation Research and Development (JRRD) and the U.S. Department of Veterans Affairs. Hello, I'm Johanna Gribble.

[Ken Frager]: And I'm Ken Frager. You can find more information about the topics we are discussing today, along with detailed Power Point presentations on most of these articles, online at the Table of Contents page for issue 51-7 at www.rehab.research.va.gov.

[Johanna Gribble]: The past decade of research has demonstrated that a significant proportion of Veterans are returning from U.S. combat operations in the Middle East with mental health disorders, reintegration problems, and physical injuries. While the Vietnam war heightened awareness of trauma-related mental health disorders, the more recent conflicts have heightened awareness of traumatic brain injury. A guest editorial in this issue highlights the factors that have contributed to the increased prevalence of traumatic brain injury, but also improved detection as a result of Department of Defense and Department of Veterans Affairs screening and evaluation programs.

[Ken Frager]: 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 cause these difficulties. Correctly identifying which factors cause the cognitive difficulties can help researchers develop more effective treatments for individuals in postdeployment settings. In the article "Factors associated with neurocognitive performance in OIF/OEF servicemembers with postconcussive complaints in postdeployment clinical settings,"

Dr. Douglas Cooper and colleagues show that effort and symptom complaints were most associated with cognitive difficulties, underscoring the importance of assessing effort in the comprehensive evaluation of postdeployment conditions.

[Johanna Gribble]: In the article “Depression, posttraumatic stress disorder, and grade point average among student servicemembers and veterans,” Dr. Craig Bryson and colleagues offer results from their survey of military personnel and veterans enrolled in college courses at universities across the United States during the 2012–2013 academic year. The authors found that military personnel and veterans reported more severe depression and posttraumatic stress disorder symptoms along with lower grade point averages. They surmised that depression was more closely associated with grade point average than posttraumatic stress disorder and that the relationship between depression and grade point average was explained by higher rates of failing exams.

[Ken Frager]: Dr. David Cifu and colleagues sought to determine whether hyperbaric oxygen improved results in a group of Marines with ongoing symptoms and abnormal eye movements following a combat-related concussion. Their findings, reported in the article “Effects of hyperbaric oxygen on eye tracking abnormalities in males after mild traumatic brain injury,” show that hyperbaric oxygen has no effect on abnormal eye movements after concussion.

[Johanna Gribble]: 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. In the article “Changes in cognition and continence as predictors of rehabilitation outcomes in individuals with severe traumatic brain injury,” Drs. Kushner and Johnson-Greene discuss the controversy regarding factors during initial hospital care and inpatient rehabilitation that may be helpful in the prediction of recovery. Their research investigated improvements in

urinary and bowel continence and cognition by discharge from inpatient rehabilitation in patients who recovered independence during a favorable period of time after trauma.

[Ken Frager]: Veterans with dementia are at risk for losing strength, mobility, and the ability to perform daily activities. A single-case feasibility study investigated whether it was possible to perform a virtual reality training exercise program with a veteran with dementia. Virtual reality games have been used to encourage exercise in various populations. The article “Two-week virtual reality training for dementia: Single-case feasibility study,” by Daniel McEwen and colleagues, discusses the possibility for future studies to validate the potential of this treatment, finding that it could be a feasible, safe, and enjoyable activity.

[Johanna Gribble]: A new intervention for restoring mobility to a person with a thoracic-level injury combines an implanted electrical stimulation system with an external controllable brace. The article “Forward stair descent with hybrid neuroprosthesis after paralysis: Single case study demonstrating feasibility,” by Dr. Bulea and colleagues demonstrates that it is possible to descend stairs using electrically stimulated muscles with this new intervention, but that future work is needed to improve the system’s reliability.

[Ken Frager]: Dr. Seiji Nambu and colleagues designed a simple control and feedback system using a human-machine interface attached to a forearm tendon, based on the idea of cineplasty, to improve electrical-powered prosthetic arms that previously lacked sensory feedback. In the article “Advantages of externally powered prosthesis with feedback system using pseudo-cineplasty,” the authors state that the user was able to determine the size of objects grasped by a robotic hand in the absence of visual information and received partial sensory feedback.

[Johanna Gribble]: In their article “Survival of male patients with spinal cord injury after cardiac arrest in Department of Veterans Affairs hospital,” Dr. Deborah Caruso and colleagues reviewed cases of CPR among patients in a spinal cord injury unit at a Department of Veterans Affairs hospital and found that survival was low. The authors noted that the conclusions were limited because of a small sample size, but felt the discussion was useful for advanced care planning.

[Ken Frager]: The article “Novel mouse model of spinal cord injury-induced heterotopic ossification,” by Heejae Kang and colleagues, relates to a novel small animal model of spinal cord injury-induced heterotopic ossification, a condition that 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. The authors hope this model will serve as a powerful tool in exploring the molecular mechanisms and developing novel treatments for this disease, thus improving healthcare for veterans.

[Johanna Gribble]: 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. In the article “Reduction of residual limb volume in people with transtibial amputation,” Dr. Audrey Tantua and colleagues analyze the reduction of residual limb volume in the postoperative phase in order to facilitate prosthesis prescription.

[Ken Frager]: 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. Dr. Angela Dietsch and her colleagues present several relevant studies in the article “Perceptual and instrumental assessments of orofacial muscle tone in dysarthric and normal speakers.”

[Johanna Gribble]: Benefits of comprehensive stroke unit care have been shown in Europe, but the effectiveness of comprehensive services as practiced in the United States is not well established. This article “Comprehensive versus consultative rehabilitation services postacute stroke: Outcomes differ” shows that Veterans with stroke who received comprehensive rehabilitation had higher gains of physical and cognitive independence and improved likelihoods of home discharge and one year survival. According to authors Margaret Stineman and her colleagues, these findings can have implications for the care of patients with stroke in the Veterans Health Administration, but additional evidence is needed.

[Ken Frager]: The article “Validity and reliability of rectus femoris ultrasound measurements: Comparison of curved-array and linear-array transducers,” by Dr. Kendra Hammond and colleagues, provides the first demonstration that measurements of a 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. Decreased muscle dimensions, particularly of locomotor muscles like the rectus femoris, are linked to increased illness and death in Veterans.

[Johanna Gribble]: Finally, the article “Vision-based approach for long-term mobility monitoring: Single case study following total hip replacement” 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. This study has significant value for adults with either mobility limitation or balance problem after age-related incidents or any physical injuries because it promotes positive and supportive care through reducing fall risk and clinic visits and maximizing independence.

[Ken Frager]: Today's discussion focused on articles in JRRD volume 51, issue 7. These articles and many others can be read online at www.rehab.research.va.gov/jrrd. Just a reminder that the *JRRD At a Glance* section is available online in English, Spanish, and Traditional and Simplified Chinese! You can submit your comments on this podcast or request articles for us to highlight at vhajrrdinfo@va.gov.

[Johanna Gribble]: Our thanks to JRRD's David Bartlinski for his audio engineering, recording, and editing to make this podcast possible. We would also like to thank all of our listeners for your support. We'd love to hear from you. For JRRD, thanks for listening. Don't forget to "Get Social" with JRRD by following us on Facebook at JRRDJournal and on Twitter at JRRDEditor.