

JRRD At A Glance Podcast Episode 34

Listen to the JRRD At a Glance Podcast Episode 34: The DEKA arm, chronic visual dysfunction, diet and exercise interventions, and more from JRRD Volume 51, Number 1, 2014.

[Johanna Gribble]: This is episode 34 of the JRRD podcast for volume 51, issue 1, produced by the Journal of Rehabilitation Research and Development (JRRD) and the U.S. Department of Veterans Affairs. As we embark on our 51st year of publishing JRRD, we want to take a moment to thank the more than 500 reviewers who volunteered their time and knowledge over the last year. We're also looking forward to a number of exciting changes during the coming year. Hello, I'm Johanna Gribble.

[Ken Frager]: And I'm Ken Frager. You can read more about how JRRD is changing to provide enhanced coverage, along with several exciting initiatives to improve the quality of rehabilitation and disability research, in the guest editorial in this issue, co-authored by Johanna Gribble and JRRD editor Stacie Yuhasz. You can find more information about this issue and the other 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 51-1 at www.rehab.research.va.gov.

[Johanna Gribble]: In a review article, Drs. Brian Hafner and Joan Sanders present a conceptual model for enhancing prosthetic rehabilitation through use of integrated physical and/or biological sensors and remote monitoring methods. Their model is based on the enormous potential that sensing and monitoring technologies offer to enhance the quality of healthcare provided to persons with lower-limb loss. The authors state that incorporating these technologies into the rehabilitation process creates opportunities for a multidimensional exchange of timely, relevant, and meaningful health information between patients, their prostheses, and healthcare providers.

[Ken Frager]: This issue of JRRD includes several articles related to usability and satisfaction with the latest prototype of the DEKA upper-limb prosthetic device. The articles are based on feedback from VA subjects, including clinicians and potential users. According to the authors, Linda Resnik and Matthew Borgia, many people with upper-limb amputation are dissatisfied with the state of the art of available prostheses. The feedback could be used as additional refinements and enhancements are made.

[Johanna Gribble]: In their article “Prediction of responders for outcome measures of Locomotor Experience Applied Post Stroke trial,” Bruce Dobkin and colleagues used two interventions, treadmill training with body-weight support plus overground practice and home-based physical therapies that did not emphasize walking, to evaluate whether the therapies produced equal results for walking ability. While the baseline measures used as predictors of who would respond did not differ between interventions or in definable subgroups of participants, the study found that patients under 60 years of age who had better balance at the beginning of the study had the most positive predictive value. The authors believe this research offers new insights into rehabilitation outcome measurements.

[Ken Frager]: Locomotor training with body weight support has created enthusiasm as an approach to improve ambulation in people with mobility impairments. In their article “Muscle activation during body weight-supported locomotion while using the ZeroG,” the authors used nondisabled adults to evaluate the new ZeroG system, which provides dynamic body-weight support using a harness during overground walking. The authors found that body-weight support decreases the amount of leg muscle activation while walking overground, but the

pattern of activation during gait remains relatively the same. With these findings, continued research on people with mobility issues will be possible with a baseline for comparison.

[Johanna Gribble]: In their pilot trial, “Cognitive Symptom Management and Rehabilitation Therapy (CogSMART) for Veterans with traumatic brain injury,” Elizabeth Twamley and colleagues developed and evaluated a 12-week intervention (Cognitive Symptom Management and Rehabilitation Therapy) in the context of a supported employment program to help Veterans with mild to moderate TBI return to the workforce. According to the authors, the intervention, which included educational components regarding TBI; strategies to improve sleep, fatigue, tension, and headaches; and compensatory cognitive strategies, may improve postconcussive performance and psychiatric symptoms, thus improving the subject’s ability to return to work.

[Ken Frager]: Mild traumatic brain injury from an explosive blast is the most common TBI among servicemembers deployed to Iraq and Afghanistan. It is different from a sports concussion, where a localized injury occurs and quickly resolves within weeks. Veterans exposed to a blast who experienced mild TBI were shown to have visual symptoms up to 5.8 years after the injury despite excellent vision, with the most common symptoms being light sensitivity and difficulty aligning the eyes to read. In their study “Chronic visual dysfunction after blast-induced mild traumatic brain injury,” Dr. Magnone and her colleagues recommend screening and eye examinations in these young veterans to diagnose and treat visual problems.

[Johanna Gribble]: An effective treatment for some cancer is cisplatin chemotherapy. However, a potential side effect of cisplatin is hearing loss. In their article “Proposed comprehensive

ototoxicity monitoring program for VA healthcare (COMP-VA),” Dawn Konrad-Martin and her colleagues describe a new, comprehensive Department of Veterans Affairs program for ototoxicity monitoring done while the Veteran receives treatment, with the goal of preventing or minimizing hearing loss. The approach is patient-centered, with audiology and oncology services working together to improve communication and coordination of care between them, which ultimately will benefit the patient and their families.

[Ken Frager]: In their article “Pressure casting technique for transtibial prosthetic socket fit in developing countries,” Dr. Peter Vee Sin Lee and colleagues aimed to provide comfortable artificial limbs to people with lower-limb amputation. Currently, the success of an artificial limb’s socket fit depends on the skill and experience of the prosthetist. The process is a lot of work, expensive, and based on artisan techniques. This project tested a pressure cast technique for producing and fitting sockets in a developing country. The method reduces skill dependency and may significantly reduce fitting errors and patient visits, leading to a dramatic improvement in the care and outcomes for people with lower-limb amputation.

[Johanna Gribble]: Healthcare services and home-based rehabilitation are in high demand, and the demand for professional physical therapy is imposing an increasing burden on the healthcare system. In their article “Biomechanical study of upper-limb exoskeleton for resistance training with three-dimensional motion analysis system,” the authors present an experimental study of a novel home-based, spring-loaded upper-limb exoskeleton meant to enable a patient or an elderly individual to move a limb at multiple joints in different planes for resistance training in a free and unconstrained environment with less inertia effect. The authors assessed the

functionality of the design by measuring kinematic data while performing designated movements, adopting a motion capture system to verify the function of the mechanism.

[Ken Frager]: The Department of Veterans Affairs reported in 2009 that more than 42,000 veterans had a spinal cord injury. There are 24 centers and additional primary care teams designated for spinal cord injury treatment in the United States. Although a vital part of rehabilitation includes assessing various components of an individual's physical health, these injuries also affect an individual's mental health. In their study "Comparison of mental health between individuals with spinal cord injury and able-bodied controls in Neiva, Colombia," the authors compare the mental health of a group of Colombian individuals with spinal cord injuries with nondisabled controls. The results illustrate the importance of considering mental health in individuals with these injuries during the rehabilitation process, especially among the VA's growing Latino population.

[Johanna Gribble]: In the article "Effects of a flat prosthetic foot rocker section on balance and mobility," Andrew Hansen and colleagues examined the effect of the flat region length of a prosthetic foot on standing balance and mobility. The human foot and ankle conform to a rolling rocker shape for walking and a flat rocker shape for standing. During use, many prosthetic foot designs bend to a rocker shape that is a compromise: a rolling rocker with a flat region. According to the authors, the length of this flat region did not affect the balance and mobility outcomes for the veterans with below-knee amputations, although those in the study tended to dislike the foot with the longest flat region.

[Ken Frager]: Veterans readjusting to civilian life often struggle to manage their weight without the structure of military Active Duty. Veterans recently returned from Iraq and Afghanistan tested three home-based exercise programs that differ in the approach to weight loss support. Results, presented in the article “Comparison of Veteran experiences of low-cost, home-based diet and exercise interventions,” will be used to guide future research and clinical program development to support Veterans struggling to maintain a healthy lifestyle postdeployment.

[Johanna Gribble]: Finally, Dr. Meaghan Leddy and colleagues present the 6-month outcomes for the study “Health and well-being of homeless veterans participating in transitional and supported employment,” which looked at various employment patterns currently supported through the Department of Veterans Affairs. This observational study is the first to directly compare these two programs, particularly with regard to non-vocational outcomes, such as quality of life and self-esteem. Clarifying the benefits of each program can help tailor employment services such that Veteran outcomes are improved.

[Ken Frager]: Today's discussion focused on articles in JRRD volume 51, issue 1. 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.

[Ken Frager]: 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 "friending" us on Facebook at JRRDJournal and following us on Twitter at JRRDEditor.