

## **JRRD At A Glance Podcast Episode 28**

**Listen to the JRRD At a Glance Podcast Episode 28: Prostheses, Parkinson disease, vocational services, and more from JRRD Volume 50, Number 5, 2013.**

**[Johanna Gribble]:** This is episode 28 of the JRRD podcast for issue 50-5, produced by the Journal of Rehabilitation Research and Development (JRRD) and the U.S. Department of Veterans Affairs. Today we're discussing a range of topics that have a direct effect on Veterans and the rehabilitation care and support they may receive. 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 topics, online at the Table of Contents page for issue 50-5 at [www.rehab.research.va.gov](http://www.rehab.research.va.gov).

**[Johanna Gribble]:** We continue to celebrate our 50<sup>th</sup> year of rehabilitation research at JRRD with a reflective commentary from Dr. Joan Sanders, a professor in the Department of Bioengineering at the University of Washington in Seattle. Dr. Sanders reflects on a 1964 commentary from volume one of JRRD (then called the Bulletin of Prosthetics Research) by Bror Troedsson titled "Stump Arterial Circulation and Its Relationship to the Prescription of a Prosthesis for the Geriatric Patient." According to Dr. Sanders, significant progress has been made when determining the appropriate location for amputation, which has improved rehabilitation and fitting options for patients, even though the reasons for amputation have changed over the years. She also sees some exciting opportunities for even greater improvements in the coming years.

**[Ken Frager]:** We hope you have been enjoying our “Then & Now” contributions and we would really appreciate your feedback. This issue also includes a review article by Joseph Belter and others entitled “Mechanical design and performance specifications of anthropomorphic prosthetic hands.” There are a number of options both in development and commercially available for prosthetic hands, and the study authors looked at several and evaluated them on various criteria.

**[Johanna Gribble]:** A pilot study by Laurent Frossard and colleagues explored the potential of portable kinetic recording systems to determine the effect of prostheses on the the remaining limb in individuals with unilateral transfemoral amputation fitted with a bone-anchored prosthesis. The research team hopes to gain evidence-based findings to improve fittings and other related issues.

**[Ken Frager]:** In the study “Cardiometabolic risk factors in Iranians with spinal cord injury: Analysis by injury-related variables,” researchers sought to determine the prevalence of cardiometabolic risk factors in people with spinal cord injuries based on injury-related variables. By evaluating waist circumference, level of injury, cholesterol intake, and polyunsaturated fatty acid intake, the guidance was to identify and treat conventional risk factors for coronary heart disease in this population.

**[Johanna Gribble]:** People with Parkinson disease who live in areas where traditional rehabilitation services are not readily accessible could benefit from Internet-based physical assessments, according to a pilot study by Trevor Russell and his team. Balance and mobility outcome measures were investigated in 12 subjects via the Internet using the eHAB telerehabilitation system, and results showed that these assessments are accurate and reliable.

**[Ken Frager]:** In the study “Coordination patterns of shoulder muscles during level-ground and incline wheelchair propulsion,” Liping Qi and others developed a method for identifying shoulder muscle coordination patterns during level-ground versus incline wheelchair propulsion, which allowed for patterns and trends in electromyography characteristics to effectively and consistently map out patterns of physical activity. Ultimately, the hope is that this will allow people with spinal cord injuries to have increased independent mobility around indoor and outdoor obstacles.

**[Johanna Gribble]:** An evaluation of more than 75,000 VHA appointments for OIF/OEF Veterans with PTSD, depression, substance abuse disorders, or traumatic brain injuries found that only 8.4 percent accessed vocational services. Veterans with TBI and more mental health issues were more likely to access these services. Overall, however, those Veterans who utilized the assistance were more likely to find competitive and longer-lasting jobs. These findings by Elizabeth Twamley and her colleagues can be found in the study “Veterans Health Administration vocational services for Operation Iraqi Freedom/Operation Enduring Freedom Veterans with mental health conditions.”

**[Ken Frager]:** In the study “Prosthesis preference is related to stride-to-stride fluctuations at the prosthetic ankle,” Shane Wurdeman and his research team found a strong relationship between the small changes that occur from step-to-step at the prosthetic ankle and how strongly the user preferred the prosthesis. The small changes from step-to-step are considered to be an important part of how the neuromuscular system controls walking.

**[Johanna Gribble]:** Can people with amputation learn to change the activity level of their residual-limb muscles? Research led by Ramses Alcaide-Aguirre at the University of Michigan, along with colleagues at

the VA and University of Washington in Seattle, found that the subjects with amputation only needed a very short amount of practice to quickly improve their residual-limb muscle control and even match the level of the nondisabled subjects. These results suggest that a similar control strategy could be used for robotic lower-limb ankle prostheses

**[Ken Frager]:** As more Veterans age and develop Parkinson disease, many may develop problems walking, in particular while performing other tasks. In the study “Effects of cognitive task on gait initiation in Parkinson disease: Evidence of motor prioritization?” led by the VA’s Joe Nocera, it was suggested that Veterans with Parkinson disease should participate in interventions (exercise and cognitive stimulation) that could improve their ability to perform more than one task at the same time.

**[Johanna Gribble]:** In the study “New method of fixation of in-bone implanted prosthesis,” Mark Pitkin and colleagues present the results of their effort to develop a strong porous pylon that could integrate with the surrounding skin and create a natural barrier against the infection associated with direct skeletal attachment of limb prostheses. The proposed method may be a more effective alternative to the established technique of implanting prostheses into the medullary canal of the hosting bone.

**[Ken Frager]:** Drs. Gerwin Smit and Dick Plettenberg study two types of cosmetic gloves used in upper-limb prosthetics and found that the silicone glove was much more flexible than the PVC glove, required less energy when flexing the finger joints, and dissipated less energy. These outcomes, considered with other significant features, may help when comparing the optimal materials for a cosmetic glove that is to be fitted to an active hand.

**[Johanna Gribble]:** Finally, a study by Catherine Smith and others of people with multiple sclerosis shows that while this patient population often feels fatigued when exercising as part of their therapy, people with multiple sclerosis should talk to their healthcare providers more confidently about what form of exercise might be best for them. This discussion will help guide healthcare providers to give exercise programs or advice that is suitable, enjoyable, and sustainable for each person with multiple sclerosis.

**[Ken Frager]:** Today's discussion focused on articles in JRRD volume 50, issue 5. These articles and many others can be read online at [www.rehab.research.va.gov/jrrd](http://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](mailto: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.

**[Ken Frager]:** 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.