

JRRD At A Glance Podcast Episode 43

Listen to the JRRD At a Glance Podcast Episode 43: Knee prostheses, supported employment, transtibial amputation, and more from JRRD Volume 51, Number 10, 2014.

[Johanna Gribble]: This is episode 43 of the JRRD podcast for volume 51, issue 10, 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 51-10 at www.rehab.research.va.gov.

[Johanna Gribble]: Beginning with this issue, JRRD is pleased to welcome Shirley Groer as our new Editor. We also would like to thank the nearly 500 peer reviewers who worked with us over the last year, allowing us to continue our 50-year tradition of exceptional research publication.

[Ken Frager]: Benefits of microprocessor-controlled prosthetic knees, which includes significant reductions in falls and other important safety-related parameters, function, and mobility, have been well established in community ambulators with a transfemoral amputation. However, little scientific literature shows whether lower-functioning individuals, for example, seniors and elderly Veterans, might also benefit from the advanced knee models. Dr. Andreas Kannenberg and colleagues evaluate the literature in the review article "Benefits of microprocessor-controlled prosthetic knees to limited community ambulators."

[Johanna Gribble]: In their article "Spinal cord injury combined with felony history: Effect on supported employment for Veterans," Dr. James LePage and colleagues discuss their efforts to

see how frequent legal problems were for a group of Veterans with spinal cord injury who were seeking employment. They also wanted to see whether legal history negatively affected employment in this group of Veterans. Their findings suggest that Veterans with a higher rate of felony conviction do have a lower rate of employment.

[Ken Frager]: In the article “Kinematic analysis of males with transtibial amputation carrying military loads,” Barri Schall and colleagues characterized temporal-spatial and kinematic gait parameters in servicemembers with and without a unilateral transtibial amputation during several military-relevant loaded walking tasks. Although the results suggest that biomechanical adaptations to carried loads in persons with amputation are similar to nondisabled individuals, the extent of these changes was larger among persons with amputation. Such evidence is important for optimizing rehabilitation and mobility strategies and minimizing risk for overuse injuries.

[Johanna Gribble]: Providing evidence that using a novel lever-propelled wheelchair design may reduce the likelihood of developing carpal tunnel syndrome, which is common in wheelchair users, Lisa Zukowski and colleagues used an ergonomic hand drive mechanism to reduce wrist orientations that compress the median nerve. Their findings, included in the article “Wheelchair ergonomic hand drive mechanism use improves wrist mechanics associated with carpal tunnel syndrome,” will benefit Veterans and others who spend a significant amount of time in a manual wheelchair.

[Ken Frager]: In the article “Experimental and computational analysis of composite ankle-foot orthosis,” researchers developed finite element analysis models for two carbon fiber and thermoplastic ankle-foot orthosis and mechanically tested them to produce force-displacement data. The authors compared the load-displacement results with the mechanical testing results to

evaluate the accuracy of the finite element analysis models and found they could produce accurate predictions.

[Johanna Gribble]: The article “Lower-limb performance disparities: Implications for exercise prescription in multiple sclerosis” describes Dr. Rebecca Larson and colleagues’ efforts to show that each leg can function differently at a submaximal level in people with mild multiple sclerosis. Currently, there is only limited information on how leg differences affect function and exercise prescription. According to the authors, the study strongly suggests that limb differences can affect overall aerobic function and subsequently affect physical activity and exercise recommendations.

[Ken Frager]: Patients with a knee disarticulation have a lengthened thigh and subsequent shortened lower leg due to the knee device built at the end of the upper leg; however, the amount of lengthening varies depending on the device used. In the article “Cosmetic effect of knee joint in a knee disarticulation prosthesis,” the authors state that the most favorable knee devices are polycentric, whereas microprocessor-controlled knees show less favorable characteristics because of their extended lengthening of the thigh.

[Johanna Gribble]: Treatment of concussions or mild traumatic brain injuries as a result of exposure to blast injury is of significant importance to the Veterans who have served in recent conflicts. With nearly 300,000 servicemembers diagnosed with mild traumatic brain injury, effective interventions for thinking skills are needed. In the article “Response to Goal Management Training in Veterans with blast-related mild traumatic brain injury,” the authors note that Goal Management Training has led to improvements in a small number of Veterans with blast-related mild traumatic brain injury, but they note that additional research is needed.

[Ken Frager]: In patients with osteoarthritis disease, total hip arthroplasty surgery is a delicate procedure and, at the same time, an important event in the patient's life. Intended to bring pain relief and allow the patient to resume his or her daily life, these improvements do not occur without the assistance of a physiotherapist or suitable exercises. In the article "Rehabilitation following total hip arthroplasty evaluation over a short follow-up time," the authors describe results from their randomized study that demonstrates the importance of physiotherapy and shows how an applied rehabilitation protocol promotes improved functional capacity and quality of life over a short follow-up period.

[Johanna Gribble]: Dr. Daphne Wezenberg and her colleagues compare the effect of two regularly prescribed prosthetic feet on the energy lost during the transition from one step to the next. Their findings, included in the article "Differentiation between solid-ankle cushioned heel and energy storage and return prosthetic foot-based on step-to-step transition cost," showed that the energy storage and return prosthetic feet lost less energy during this transition than solid-ankle cushioned heel prosthetic feet. According to the authors, these results contribute to better understanding of the difference in mechanical properties of both feet. They also provide important information that helps to optimize the development of new and more efficient prostheses.

[Ken Frager]: Today's discussion focused on articles in JRRD volume 51, issue 10. 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. You also can "Get Social" with JRRD by "following" us on Facebook at JRRDJournal or on Twitter at JRRDEditor.

[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.