JRRD at a Glance

Case report of modified Box and Blocks test with motion capture to measure prosthetic function

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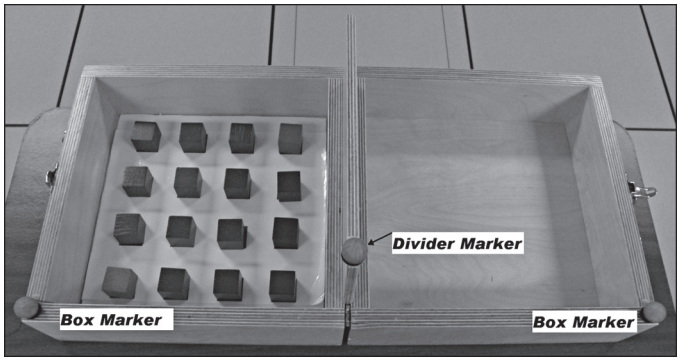


The Box and Blocks test, a widely used outcome measure of upper-limb function, was modified and motion capture was added to study performance of a subject with a body-powered prosthesis compared to a myoelectric prosthesis following targeted muscle reinnervation surgery. With motion capture analysis, it was possible to look at movement of the prosthesis as well as compensatory body motion. Addition of motion capture has the potential to be useful to measure outcomes for upper-limb prosthesis users.

Pilot study of Internet-based early intervention for combat-related mental distress

Benjamin W. Van Voorhees, MD, MPH, et al.

Early symptom states of mental distress and impairment are not currently well targeted in the veteran population because it is typically assumed that these states are normal and will lessen with time. The core principle behind this study is that these states are serious and that a transdiagnostic, Internet-based early intervention can reduce symptoms of posttraumatic stress disorder (PTSD) and depression, prevent progression to full disorder, and accelerate veterans' reintegration into civilian life. The results suggest that Internet interventions adapted from standard psychotherapy practices

may be well accepted and utilized, reduce symptoms of PTSD and depression, and improve veteran functioning postdeployment.

Rehabilitation of injured U.S. servicemember with traumatic brain injury, stroke, spinal cord injury, and bilateral amputations: A case report

Ajit B. Pai, MD, et al.

The complex injuries that can result from combat, specifically from the Operation Iraqi Freedom/Operation Enduring Freedom conflicts, are challenging. As injured troops leave the war zone early for medical care, they are treated by an interwoven system of care that includes both the Department of Defense and the Veterans Health Administration. Because physicians across these settings are increasingly faced with patients with multiple rehabilitation diagnoses caused by severe blast injuries, the importance of active communication across the system must be highlighted.

Postdeployment symptom changes and traumatic brain injury and/or posttraumatic stress disorder in men

Caroline A. Macera, PhD, et al.

Blast-related injuries associated with combat may result in mild traumatic brain injury (TBI) symptoms that are difficult to distinguish from posttraumatic stress disorder (PTSD) based on symptom report. More than 12,000 U.S. Navy sailors and Marines who deployed between 2008 and 2009 reported symptoms immediately after returning from deployment and then about 6 months later. Those with probable PTSD and TBI formed a unique group defined by the development or persistence of all symptoms (except musculoskeletal) during the months after returning from deployment. Providers should evaluate whether servicemembers have both PTSD and TBI and focus on treating their symptoms rather than a specific diagnosis.

Absence of verbal recall or memory for symptom acquisition in fear and trauma exposure: A conceptual case for fear conditioning and learned nonuse in assessment and treatment

A. Ronald Seifert, PhD

Absence of memory or verbal recall for symptom acquisition in fear and trauma exposure, as well as absence of successful coping behavior for life events, is associated with a number of diagnoses, including traumatic brain injury, posttraumatic stress disorder, pain, and anxiety. The difficulty with diagnosis and treatment planning based on the absence of recall, memory, and successful coping behavior is threefold: (1) these assessments do not distinguish between disruption of behavior and lack of capacity, (2) the absence of verbal recall and memory complicates cognitive-based treatment, and (3) a confounding issue is the same absent behavior can be observed at different times and contexts. The absence of memory or lack of verbal recall does not rule out measurable physiological bodily responses for the initial trauma(s), nor does it help to establish the effects of subsequent experiences for symptom expression. Also, the absence of memory must include the prospect of fear-based learning without involvement of the cortex. It is suggested that fear conditioning and learned nonuse provides complementary illustrations of how the time and context of the initial trauma(s) and later experiences affect behavior, which is not dependent on the affected individual being able to provide a memory-based verbal report.

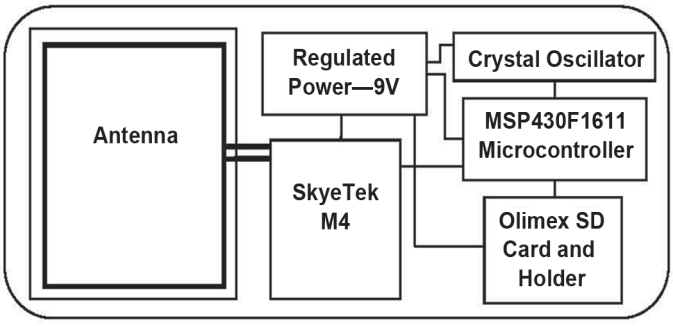
Advancement of physical process by mental activation: A prospective controlled study

S. Lehrl, PhD, et al.

Recent research on cognitive development has shown that patients with physical mobility limitations can be rehabilitated if their working memory is used to capacity. We evaluated whether the video game *Dr. Kawashima's Brain Training: How Old Is Your Brain?* played on a Nintendo DS can help patients recover faster after surgical interventions. We enrolled 32 participants (16 in the gaming group and 16 in the control group) in our study. The gaming group reached higher scores in an outcome measurement score 2 weeks after surgery. This research helps all veterans achieve the best and fastest recovery possible after a surgical intervention.

Device to monitor sock use in people using prosthetic limbs: Technical report

Joan E. Sanders, PhD, et al.

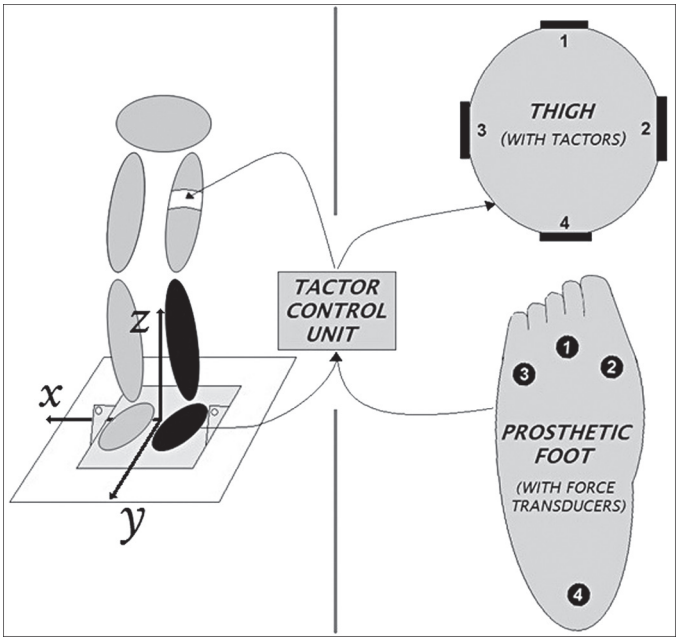


A prototype instrument was developed to monitor socks worn by persons using lower-limb prostheses. The device may benefit people with limb loss by providing information to practitioners and patients about

sock use practices between clinical visits: daily sock use, when sock changes are made, and how consistently sock accommodations are made. The developed instrument uses radio frequency waves to communicate between an instrument box mounted on the prosthesis and thin flexible tags on the socks. In the present study, a proof of concept was accomplished. The sock monitor will need to be enhanced so that it reliably detects all socks independent of the socket material, presence of pistoning, the number of socks, and the orientations of the tags.

Can vibratory feedback be used to improve postural stability in persons with transtibial limb loss?

David Rusaw, PhD, et al.



Afferent sensory information is important for maintaining postural stability. However, limb amputation permanently removes afferent sensory information from the amputated limb. This study provided vibratory feedback from force sensors under the prosthetic foot to transtibial prosthesis users. The results indicate that the device may not improve all measures of postural stability and that certain postural control mechanisms respond more positively than others.

Energy consumption during prosthetic walking and physical fitness in older hip disarticulation amputees

Takaaki Chin, MD, et al.

Since prosthetic rehabilitation of older hip disarticulation (HD) patients is a specialized area, there have been very few reports investigating the energy consumption and physical fitness in such patients. Thus, clinical information available for use in the rehabilitation of older HD amputees is lacking. To our knowledge, this is the first research addressing both energy and physical fitness in older HD patients. Our preliminary study clarified both energy consumption during prosthetic walking and physical fitness for older HD amputees. This information would be helpful in the clinical field of prosthetic rehabilitation for older HD amputees.

Activity monitor accuracy in persons using canes

Deborah Michael Wendland, PT, DPT, CPed;
Stephen H. Sprigle, PhD, PT

The aim of this study is to report strategies to configure the StepWatch device for people who use canes and to report the accuracy of the device in this population when mounted both on the leg and on the cane. A population ranging from 67 to 85 years old who use canes was used. StepWatch devices were calibrated and then validated on multiple indoor and outdoor surfaces. The leg-mounted StepWatch device had an accuracy of 93.4% across all surfaces, whereas the cane-mounted StepWatch had an accuracy of 84.7%. StepWatch accuracy when used over stairs was significantly lower than other surfaces. Activity monitoring is an important mechanism to assist with promotion of physical activity, as well as to provide feedback for cane usage. As part of an aging society, veterans display many of the same problems as all of society: decreased activity levels and comorbidities such as diabetes and subsequent skin problems. Additionally, injuries from service may result in the need for assistive devices. It is important to validate the StepWatch on a group of people who use assistive devices so that healthcare providers can take

advantage of the usefulness of such monitoring to improve the health outcomes in those with mobility limitations as well as those with compromised skin.

The Unified Parkinson's Disease Rating Scale as a predictor of peak aerobic capacity and ambulatory function

Frederick M. Ivey, PhD, et al.

The Unified Parkinson's Disease Rating Scale (UPDRS) is used to track disease severity in veterans with Parkinson disease (PD). Ideally, doctors would have a full range of objective functional capacity measures on which to base decisions, but time and resources limit what can be done in the clinical setting. For this reason, easier-to-use rating instruments like the UPDRS are widely applied. A key remaining question is how well the UPDRS tracks objective measures of functional performance. Our study comparing UPDRS with measures of functional capacity in 70 mild to moderately impaired PD participants showed a weak relationship with ambulatory function and no relationship with peak aerobic capacity.

Age-related changes in consonant and sentence processing

David L. Woods, PhD, et al.

Older subjects often experience difficulty understanding conversations in noisy listening conditions, but the reasons for this remain poorly understood. In experiment 1, we used the California Syllable Test (CaST) to measure the ability of younger and older listeners with normal hearing to identify common American-English consonants in syllables presented in noise. The CaST revealed that older subjects showed impaired identification of hard-to-identify consonants in noise and that these impairments reflect both reduced hearing sensitivity and impaired processing of phonological cues within the central nervous system. In experiment 2, older subjects with normal hearing proved to be just as good at understanding sentences as younger subjects with normal hearing. This appears to reflect the fact that existing sentence tests do not require the processing of hard-to-identify consonants. Moreover, older subjects appear superior in using sentence context to piece together the meaning of sentences in difficult listening conditions.