

## **Prevalence of heat and perspiration discomfort inside prostheses: Literature review**

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The socket is the main component of a prosthesis that, by connecting the prosthesis to the residual limb, transfers loads and motions. Socket comfort could directly affect the function of a person with amputation. Due to heat and perspiration inside the socket barrier, the environment is commonly hot and moist. This situation causes thermal discomfort and prevents prosthesis use, especially in warm climates and during long activities. Skin irritations, ulcers, infections, and unpleasant odors are consequences of this thermal environment. The existence of this problem limits activities in people with amputation and causes discomfort and dissatisfaction with prosthesis use.

<http://dx.doi.org/10.1682/JRRD.2013.06.0133>

## **Elevated liver enzymes following polytraumatic injury**

Aaron Fox, MD, et al.

This study examined the factors associated with mild liver enzyme elevations in patients with traumatic brain injury. The study reviews the testing that was performed as the result of these abnormalities. It also proposes general recommendations should an individual with a traumatic brain injury develop such findings on routine testing.

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## **Fascia—Current knowledge and future directions in physiatry: Narrative review**

Evan H. Kwong, BSc, MD, MSc; Thomas W. Findley, MD, PhD

Fascia can be described as part of all of the connective tissues in the human body. However, it does not have a clear definition in the medical community. Fascia may be the key to helping us understand how the musculoskeletal system works or becomes a source of pain. Understanding its importance can help physicians diagnose and treat various painful musculoskeletal disorders. This is a narrative review summarizing the current knowledge about fascia, from the perspective of the specialty of Physical Medicine and Rehabilitation.

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## **Individualizing goals for users of externally powered partial hand prostheses**

Lynsay Whelan, MS, OTR/L, et al.

Veterans returning from the conflicts in Iraq and Afghanistan represent a young, active population demanding high-functioning prostheses following limb loss. Studies have reported that quality of life for veterans with partial hand loss was more affected than for veterans with transhumeral amputation. For those with partial hand limb loss, advanced technology has not been available until recently. Identifying which tasks are most important and difficult for individuals with partial hand loss is vital to improving their quality of life.

<http://dx.doi.org/10.1682/JRRD.2013.08.0181>

### **Physical activity barriers and enablers in older Veterans with lower-limb amputation**

Alyson J. Littman, PhD, et al.

Little is known about the types of physical activities that older individuals with lower-limb loss perform or the correlates, barriers, and facilitators to regular physical activity. We conducted an exploratory study in 158 older Veterans from the Pacific Northwest with a partial-foot, below-knee, or above-knee amputation. Walking/wheeling, strength training, gardening, and bicycling were the most frequently performed physical activities, but over half of participants were insufficiently active. To increase physical activity in this population, interventions should address motivational issues, improve information sharing about resources and techniques, address television watching, reduce financial barriers to exercising, and consider involving family members.

<http://dx.doi.org/10.1682/JRRD.2013.06.0152>

### **Toward an artificial sensory feedback system for prosthetic mobility rehabilitation: Examination of sensorimotor responses**

Aman Sharma, MHSc, et al.

The focus of the research was Veterans with lower-limb amputation who are currently limited in their abilities due to a lack of sensory information about the status of their prosthesis. This work explored the ability of nondisabled individuals and lower-limb prosthetic users to respond to vibratory tactile feedback. This new information may ultimately help inform the design of an artificial sensory feedback system to augment proprioceptive and sensory information, which may be helpful in improving overall rehabilitation outcomes for people with lower-limb amputation.

<http://dx.doi.org/10.1682/JRRD.2013.07.0164>

### **Normative data for modified Box and Blocks test measuring upper-limb function via motion capture**

Jacqueline S. Hebert, MD, FRCPC, et al.

A widely used outcome measure of upper-limb function, the Box and Blocks test, was modified and motion capture was used to collect normative kinematic data. The data collected were displayed in kinematic graphs that allow us to define “normal” upper-limb motion with this test. This new test has the potential to be a useful outcome measure for persons with upper-limb impairment to quantify function and evaluate the effect of treatment interventions.

<http://dx.doi.org/10.1682/JRRD.2013.10.0228>

### **Subjective cognitive complaints and neuropsychological test performance following military-related traumatic brain injury**

Louis M. French, PsyD, et al.

For most patients who have had a traumatic brain injury (TBI), particularly mild TBI, treatment focuses on resolving self-reported symptoms. While many symptoms are often psychological (for example, depression), self-reported cognitive problems are common (for example, poor memory). Given the importance of self-reported symptoms for treatment and compensation after TBI, we examined the accuracy of patient self-report in determining the presence and severity of cognitive problems. We found that while self-reported cognitive problems were not consistently associated with cognitive performance as measured with tests, these problems were often associated with psychological distress. This mismatch might be the result of the patient having less insight or expecting to have problems after a TBI. These findings highlight the strong value of educational interventions about TBI outcome in this population.

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### **Preliminary evaluation of a variable compliance joystick for people with multiple sclerosis**

Harshal P. Mahajan, PhD, et al.

Upper-limb fatigue is a common problem that may restrict people with multiple sclerosis (MS) from using their electric powered wheelchair effectively and for a long period of time. The objective of this research was to evaluate whether participants with MS can drive a wheelchair better using a variable compliance joystick (VCJ) and customizable algorithms than when using a conventional joystick. Participants showed improved driving performance while using the customized personally fitted algorithms with the VCJ, which have potential to be effective wheelchair input interfaces.

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### **Assessment of learning powered mobility use— Applying grounded theory to occupational performance**

Lisbeth Nilsson, PhD, OTR; Josephine Durkin, PhD, DipCOT

A new assessment tool for powered mobility has been developed with the focus on the learner's actual performance and learning. The instrument Assessment of Learning Powered Mobility Use is used together with a set of facilitating learning strategies that help with the fine tuning of practice so that learners are presented with "the just right challenge" as part of their rehabilitation. This approach meets the needs of people with cognitive and physical disabilities who need to work on skills such as regulating attention, using tools, multitasking, solving problems, and making judgments.

<http://dx.doi.org/10.1682/JRRD.2013.11.0237>

### **Dynamometer-based measure of spasticity confirms limited associations between plantarflexor spasticity and walking function in persons with multiple sclerosis**

Theodore R. Kremer, BS, et al.

Persons with multiple sclerosis (pwMS) often have difficulty walking. Spasticity is a common symptom of multiple sclerosis that is thought to contribute to reduced walking speed, walking endurance, and a person's perception of walking problems. However, the extent to which spasticity is associated with walking dysfunction in pwMS is unclear. This article expands upon previous work and confirms a weak association between ankle spasticity and walking problems in pwMS, at least for those with mild clinical disability and mild spasticity. Understanding how spasticity affects walking will help medical professionals decide the most efficient and effective way to treat the walking difficulties that pwMS encounter.

<http://dx.doi.org/10.1682/JRRD.2013.08.0186>

### **Reliability of freehand three-dimensional ultrasound to measure scapular rotations**

Lynn A. Worobey, PhD, et al.

Shoulder pain and pathology are common in veterans, particularly among those who use wheelchairs. These problems have been related to changes in scapular movement; however, existing methods for evaluating such movement are invasive, expose patients to radiation, or are inaccurate. This study evaluated the reliability of freehand three-dimensional ultrasound in determining scapular position. We found substantial to almost perfect reliability and low error for repeated scans in different arm positions. After further validation studies, this could be a new, noninvasive way to identify risk of shoulder pathology and preserve shoulder function.

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### **Method for enhancing text entry rate with single-switch scanning**

Heidi Horstmann Koester, PhD; Richard Callaghan Simpson, PhD, ATP

Some individuals with severe physical impairments use single-switch scanning to enter text for spoken and written communication. While single-switch scanning allows communication using only one controlled input movement, it is a slow method of text entry. We developed a method for adjusting the settings in a single-switch scanning interface to increase a user's text entry rate. We evaluated that method with nine individuals who use single-switch scanning to communicate. Text entry rates improved an average of 120 percent. All nine subjects increased performance by at least 40 percent, and five of the nine increased by over 100 percent.

*<http://dx.doi.org/10.1682/JRRD.2013.09.0201>*

### **Fukuda and Babinski-Weil tests: Within-subject variability and test-retest reliability in nondisabled adults**

Nicole Paquet, PhD, et al.

Dizziness is a frequent, debilitating symptom in older adults and is associated with a high risk of falls. Ear, nose, and throat doctors and physiotherapists assess inner ear function with clinical tests in which patients step on the spot or walk forward and backward with their eyes closed. The question is whether these tests distinguish truly dizzy patients from healthy, nondisabled individuals. The study revealed that many nondisabled participants had abnormal test results. In addition, the nondisabled participants' performances were unstable from trial to trial. These results may help clinicians better understand the limitations of these clinical tests.

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