

Healthcare utilization and costs of Veterans screened and assessed for traumatic brain injury

Kevin T. Stroupe, PhD, et al.

Over 12 mo following their initial evaluation, Veterans screening positive on a traumatic brain injury (TBI) clinical reminder had over 85 percent higher total costs than Veterans who screened negative. Understanding healthcare utilization and cost patterns following TBI screening is important for policymakers as they address the ongoing and future healthcare needs of returning Operation Iraqi Freedom/Operation Enduring Freedom Veterans.

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Methods for characterization of mechanical and electrical prosthetic vacuum pumps

Oluseeni Komolafe, PhD, et al.

Prosthetic vacuum pumps generate high levels of vacuum pressure that are used to secure prosthetic sockets onto the residual limbs of persons with amputation. Despite the increasing use of vacuum pumps in clinical practices, there are only a few guidelines directing the prosthetist's and user's selection among alternative vacuum pumps. These guidelines are primarily limited to manufacturer specifications. This report describes techniques developed to assess the performance of prosthetic vacuum pumps and demonstrates those techniques using a number of commercially available electrical and mechanical pumps. The findings may contribute to clinicians' judgments on appropriate componentry for their patients' needs.

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Comparison of two impression techniques for auricular prosthesis: Pilot study

Kasim Mohamed, MDS, et al.

This article highlights the efficacy of a new impression technique, the triple-layer impression technique (TLIT), which plays a vital role in fabricating a cosmetic silicone auricular prosthesis for unilateral auricular defects. The TLIT reduces the distortion of the ear in impressions. The models were more accurate when compared with the conventional impression technique described in the literature. Thus, TLIT will help the maxillofacial prosthetist achieve better orientation of unilateral ear prostheses.

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Relationship between cognition and gait performance in older adults receiving physical therapy interventions in the home

Susan L. Whitney, DPT, PhD, NCS, ATC, FAPTA, et al.

Older adults who are receiving home-care physical therapy services were studied to determine whether how they think and how they walk are related. We studied 10,953 people over the age of 65 to try to better understand if there was a relationship between a clinician's ranking of how well someone's brain was working and how well that person walked. There appears to be a strong relationship between people's ability to think clearly and how well they can walk in their homes.

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Predictive value of upper-limb accelerometry in acute stroke with hemiparesis

Nick Gebruers, PhD, PT, et al.

The use of accelerometers in patients with stroke is novel, especially in the acute phase of stroke. The use of accelerometers in acute stroke is warranted since no cooperation of the patient is needed to collect data. We investigated whether arm use, measured by accelerometers, has a predictive value for the disability status 3 mo after stroke. It was demonstrated that age and the amount of arm use could correctly predict (85%) the modified Rankin Scale score after 3 mo of follow-up.

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Sampling frequency impacts measurement of walking activity after stroke

Brian Knarr, PhD, et al.

Lack of physical activity has serious health and functional consequences for people after a stroke. Therefore, interventions to improve activity after a stroke and accurate methods to measure activity are needed. This study examined how the length of the interval over which activity data are sampled affects the measurement of activity. The results showed that the length of the sampling interval can result in either overestimating or underestimating activity. Such overestimation and underestimation is worse when activity is low, which could affect the interpretation of comparisons between groups of people with very different activity amounts.

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Mechanisms of arm paresis in middle cerebral artery distribution stroke: Pilot study

Vishnumurthy S. Hedna, MD, et al.

Presently, rehabilitation of weakness after stroke exclusively involves work with physical and occupational therapists. Scientific studies have shown that,

if provided correctly and in adequate amount, this rehabilitation can be effective but that strong limitations exist to how much recovery can be achieved in this way. Significant advances in neurorehabilitation will depend on increasing the amount of neural tissue that recovers from the stroke. This study suggests that weakness after stroke is caused predominantly by damage to neural connections deep within the brain (white matter) and that neuroscientists should concentrate on strategies to enhance white matter recovery.

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Functionality of i-LIMB and i-LIMB Pulse hands: Case report

Olga van der Niet, et al.

Multiarticulated myoelectric prosthetic hands move almost like human hands. But are these hands more functional than traditional prosthetic hands? The i-LIMB and i-LIMB Pulse hands were tested over time in a case study. Functionality of the i-LIMB improved after a year of use. The i-LIMB Pulse had more grip strength and was less vulnerable than the i-LIMB. The user valued the preset grip features of the i-LIMB Pulse because it made complex control quicker and easier. Conclusions from this study are that the i-LIMB Pulse is more functional than the i-LIMB and that training and experience are needed to benefit from multiarticulated hands.

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Biomechanical evaluation of wrist-driven flexor hinge orthosis in persons with spinal cord injury

Yeoun-Seung Kang, MD, PhD, CPO, et al.

A wrist-driven flexor hinge orthosis (WDFHO) is a device used to restore hand function in persons with paralyzed hands. The device is inexpensive and easy to use by persons with impaired hand function caused by spinal cord injury. We analyzed the effectiveness of a WDFHO in persons with spinal cord injury. For this, we introduced mathematical

equations to model operating principles and evaluated the effectiveness of the WDFHO. Our results confirmed that pinch force significantly improved after using the WDFHO. In addition, we found that the device requires better alignment for persons with greater wrist strength.

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Body composition and physical function in women with multiple sclerosis

Christie L. Ward, MS, et al.

According to the Department of Veteran Affairs, approximately 26,000 veterans have been diagnosed with multiple sclerosis (MS) and are included in the VA MS data repository. MS is related to reductions in physical abilities and loss of independence. Our data suggest that lower relative body fat and greater physical activity are related to higher levels of physical function in women with MS. So, reducing fat and increasing physical activity may be effective intervention strategies for helping MS patients maintain independence. A healthcare provider can prescribe appropriate types of exercise for an MS patient.

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Effects of foot posture and heel padding devices on soft tissue deformations under the heel in supine position in males: MRI studies

Shay Tenenbaum, MD, et al.

Heel pressure ulcers are associated with significant morbidity. There are sparse data regarding the

basic etiology of heel ulcers and efficacy of prevention aids such as heel padding devices. We explored the effects of foot posture and different padding devices on soft tissue deformations using magnetic resonance imaging (MRI). We found that when the foot is in external rotation, skin tissue deformations are significantly greater than when the foot is upright. Heel padding devices have a significant effect on reducing internal soft tissue deformations. This study shows that MRI is a powerful tool in assessing the biomechanical performances of heel padding devices.

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Visual training and emotional state of people with retinitis pigmentosa

Helena Chacón-López, PhD, et al.

This study evaluates the effect of perceptive training on the visual performance and the emotional state of people with restriction in contrast sensitivity (CS), such as those with retinitis pigmentosa (RP). The outcomes showed significant progress, which suggests that the program could be a helpful addition to RP rehabilitation, improving performance and autonomy in daily life tasks and emotional state. The program could also be useful in the rehabilitation of other people with deficits in CS, alleviating the repercussions that these problems have for performing daily activities and well-being.

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