

Dependency aspect of caregiver burden is uniquely related to cognitive impairment in Veterans

Jennifer M. Stinson, PhD, et al.

The prevalence of Veterans with dementia in the Veterans Health Administration is estimated to be 275,000 annually over the next decade, with an average yearly incidence of 89,000. In addition to associated interpersonal, social, and financial costs, there will be an inevitable increase in burden among care providers. In a sample of Veterans, we analyzed dimensions of caregiver burden as they relate to neuropsychological functioning and found that aspects of cognitive functioning differentially influence perceptions of caregiver burden. Determining the relationship between cognitive functioning and burden has implications for how to best provide care to an aging Veteran population.

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Correlates of pain symptoms among Iraq and Afghanistan military personnel following combat-related blast exposure

Kelcey J. Stratton, PhD, et al.

A better understanding of individual difference factors and comorbid conditions related to pain may be useful for identifying individuals at the greatest risk for developing complex and persistent symptoms following combat. The present study reveals that older age, mild traumatic brain injury (TBI) characteristics, depression symptoms, and posttraumatic stress disorder re-experiencing symptoms are related to self-reported pain among military personnel exposed to blasts during combat. Clinical interventions frequently target pain, psychiatric, and TBI symptoms separately; however, the significant associations between these conditions suggest that

integrated treatment approaches that address the significant overlap in polytraumatic injuries may better meet Veterans' needs.

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Diagnostic accuracy of Posttraumatic Stress Disorder Checklist in blast-exposed military personnel

William C. Walker, MD, et al.

Exposure to psychologically traumatic events is an inherent aspect of military combat and often leads to posttraumatic stress disorder (PTSD). Because of the insurgents' heavy use of explosive munitions, U.S. servicemembers of Operation Enduring Freedom, Operation Iraqi Freedom, and Operation New Dawn have experienced an especially high rate of exposure to blast-related traumatic events. This study assesses how well a commonly used PTSD screening tool, the PTSD Checklist, detects PTSD in blast-exposed servicemembers. The findings should help clinicians and researchers better understand how to measure PTSD in these patients.

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Coronal plane socket stability during gait in persons with transfemoral amputation: Pilot study

Stefania Fatone, PhD, BPO(Hons), et al.

Little research describes which design features of a transfemoral socket (e.g. ischial containment [IC] and medial tissue loading) are important for coronal plane stability, socket comfort, and gait. The results of our pilot randomized crossover study suggest that medial tissue loading contributes little to coronal plane stability and comfort in a well-fitted IC socket and are consistent with classic theory

describing the importance of soft tissue loading along the proximal-medial aspect of the residual limb in sockets without IC.

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Active dorsiflexing prostheses may reduce trip-related fall risk in people with transtibial amputation

Noah J. Rosenblatt, PhD, et al.

The ProprioFoot is a motorized, microprocessor-controlled foot that imitates normal ankle motions of dorsiflexion during the swing phase of gait. This study found that people with transtibial amputation using the ProprioFoot walk in a way that decreases their chances of tripping over an obstacle compared with wearing other prosthetic feet without the motorized motion. The findings suggest that individuals who often trip or walk over inclines and uneven surfaces may benefit from this foot. Overall, using the ProprioFoot may improve safety.

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Symmetrical kinematics does not imply symmetrical kinetics in people with transtibial amputation using cycling model

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Veterans with lower-limb loss who use a prosthetic limb move with different joint angles and joint forces in their sound and amputated limbs. Clinicians normally try to create symmetry in limb movement, assuming that joint forces will also become symmetrical. This study used cycling to define how differences in joint angles and joint forces were related. Our results imply that reducing differences in joint angles does not affect joint loading as assumed in clinical practice. We propose that clinicians should define an acceptable amount of asymmetry and use that information to improve rehabilitation.

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Pilot study of a strap-based custom wheelchair seating system in persons with spinal cord injury

John E. Ferguson, PhD, et al.

This study evaluated a custom wheelchair seat made of interwoven straps in three Veterans with spinal cord injuries. Seating pressures were not affected following common wheelchair activities such as wheeling and transferring. Also, therapists were able to customize the strap lengths to obtain acceptable pressure distributions for the subjects in 4 to 40 min. This study can help inform future studies that test the long-term use of strap-based wheelchair seats and that help identify which individuals would most benefit from rapidly customizable strap-based seating.

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Effects of conventional and alternating cushion weight-shifting in persons with spinal cord injury

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An effective wheelchair cushion is essential to prevent pressure ulcer development, enabling the individual to achieve optimal mobility function and quality of life. Use of an alternating-pressure air cushion (APAC) may provide regular automatic weight-shifting. A repeated-measures study of thirteen adult full-time wheelchair users with spinal cord injury was carried out to determine whether APAC use provides reliable, effective pressure relief compared with independent pressure relief (IPR). We found that IPR positively affects multiple aspects of tissue health but produces brief improvements. APAC use provides dynamic and continuous weight-shifting with more sustained positive tissue health effects.

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Biopsychosocial functioning and pain self-efficacy in chronic low back pain patients

Alex L. Koenig, MS, et al.

Poor biopsychosocial functioning and low levels of pain self-efficacy (an ability to tolerate pain and complete daily activities despite pain) have been found to contribute to higher pain severity. This study examined the relationship between biopsychosocial functioning and pain severity and evaluated whether pain self-efficacy indirectly affects this relationship. The results indicate that social functioning is an important factor in predicting pain severity and pain self-efficacy. It is necessary to consider social functioning when trying to understand the development of difficulties in patients with chronic low back pain.
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Does unilateral transtibial amputation lead to greater metabolic demand during walking?

Elizabeth Russell Esposito, PhD, et al.

Previous literature reports greater metabolic demand of walking following amputation. However, the subject populations were generally older and less fit than current servicemembers. This study compared energy expenditure in young, active individuals with below-knee amputations and healthy nondisabled individuals during walking. Energy expenditure was not different between groups across a wide range of walking speeds. Despite missing part of a limb, individuals with amputation rated their walking abilities as very high and did not find walking challenging. Young, active servicemembers may expect energy expenditures lower than those indicated by previous reports on older, less active patients with amputation.
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Computer simulations of efficacy of air-cell-based cushions in protecting against reoccurrence of pressure ulcers

Ayelet Levy, MSc, et al.

For individuals who depend on a wheelchair for mobility, sitting-acquired pressure ulcers are a common and life-endangering complication. In patients with a spinal cord injury in particular, changes that affect the weight-bearing tissues of the buttocks may increase the risk for pressure ulcers, exposing this already-at-risk population to the additional potential risk caused by soft tissue scarring. Here, we used computational modeling to evaluate the biomechanical efficacies of an air-cell-based cushion for individuals who have previously experienced pressure ulcers that healed but left different types of scars. Our simulations indicate that an air-cell-based cushion is adequately protecting patients with a history of severe pressure ulcers manifested by large, possibly deep tissue scarring in their buttocks.

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Family Care Map: Sustaining family-centered care in Polytrauma Rehabilitation Centers

James H. Ford II, PhD, et al.

We surveyed and interviewed staff at four Polytrauma Rehabilitation Centers about the implementation and sustainability of the Family Care Map. Staff perceptions about sustainability were related to their commitment to change as well as involvement during implementation. The study indicated that sustainability of the Family Care Map occurs when its principles have been integrated into daily workflow and organizational culture. Outdated information in the Family Care Map and lack of staff awareness and use represent barriers to sustainability.

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Cost of lower-limb amputation in U.S. veterans with diabetes using health services data in fiscal years 2004 and 2010

Heather Franklin, MPH, et al.

Diabetes is highly prevalent in the U.S. population, and especially so among veterans, resulting in a 10- to 20-fold increased risk of lower-limb amputations (LLAs). LLAs are burdensome, both in terms of healthcare costs and for the patient's quality of life. This study is a cross-sectional analysis of Veterans Health Administration (VHA) clinic users identified as having diabetes with nontraumatic LLAs in fiscal years 2004 and 2010. LLA expenditures related to inpatient surgery, pharmacy, and outpatient care were evaluated. The main objective was to estimate the economic burden of diabetes-related LLAs in the VHA system in fiscal years 2004 and 2010.

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Novel balance rehabilitation and training apparatus to improve functional balance

David M. Kocejka, PhD; Jeffrey S. Greiwe, PhD

Many veterans have problems with their balance due to conditions such as aging, traumatic brain injuries, amputations, war-related injuries, and concussions that require rehabilitation. We have developed a novel balance rehabilitation and training apparatus to help individuals improve their functional balance and minimize their fear of falling and fall risk. We performed scientific research on this apparatus to determine whether it provides the benefits for which it was designed and to show it works in a "real-world" setting. We confirmed the apparatus could be a valuable tool to help rehabilitate individuals with balance impairments and improve their quality of life.

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