

Balance problems after unilateral lateral ankle sprains

Mohammad Akbari, PhD, et al.

We examined balance problems in athletes with acute lateral ankle sprains by recruiting 30 male athletes with right dominant side and traumatic ankle sprain through simple nonprobability sampling. We measured their sway index and limits of stability with the Biodex Balance System under different conditions. Our results showed that balance ability in patients with acute lateral ankle sprain was significantly weaker when their eyes were closed rather than open. We also found that after lateral ankle sprain, balance problems occur and are a result of proprioceptive deficits, especially the unconscious (reflexive) aspect of proprioception as opposed to the conscious (voluntary) aspect. This factor probably plays an important role in recurrence of ankle sprain. Improvement in the conscious aspect can occur in the first month of treatment, but the unconscious aspect experiences a delay in healing of 3 to 6 months. Therefore, an effective rehabilitation program for managing proprioceptive deficits should be followed.

Differences in cause of death of Washington State veterans who did and did not use Department of Veterans Affairs healthcare services

Charles Maynard, PhD; Edward J. Boyko, MD, MPH

We compared characteristics and causes of death in 62,080 Washington State veterans who did and did not use Department of Veterans Affairs (VA) healthcare services 5 years before death. We found that 20 percent of the veterans used VA services; they were more often male, younger, less educated, more often divorced, and more often smokers. We also found that both female and male veterans who used VA healthcare were more likely to die from alcohol- and/or drug-related causes. VA medical centers provide a range of addiction treatment services not typically offered in other healthcare systems, which may partly explain the higher likelihood of death due to substance use disorders. Our findings suggest that the VA patient population is socially disadvantaged and more severely affected by substance use disorders than veterans who do not use VA healthcare services.

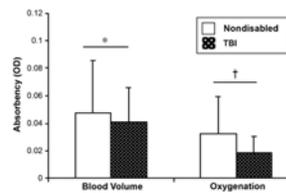
Demographic characteristics of veterans who received wheelchairs and scooters from Veterans Health Administration

Sandra L. Hubbard, PhD, OTR/L, ATP, et al.

Our study characterized veterans who received wheeled mobility equipment (WME) from the Veterans Health Administration (VHA) by analyzing the variance in wheelchair provision based on sex, race/ethnicity, diagnosis, and age. A logistic regression analysis revealed associations between WME provision and age, sex, and race/ethnicity when diagnosis and number of comorbidities were controlled for. Hispanics, African Americans, and American Indians/Asians were more likely than Caucasians to receive standard wheelchairs (also the most frequently prescribed wheelchair for all diagnoses), while younger patients were more likely to receive ultralightweight wheelchairs. Our purpose was to determine whether characteristics varied significantly according to the type of WME provided. The findings strongly suggested a disparity in the provision of wheelchairs by the VHA and that the standard of care for the provision of WME within the VHA is not of the same quality as in other populations.

Reliability of near-infrared spectroscopy measures of cerebral oxygenation and blood volume during handgrip exercise in nondisabled and traumatic brain-injured subjects

Yagesh Bhambhani, PhD, et al.

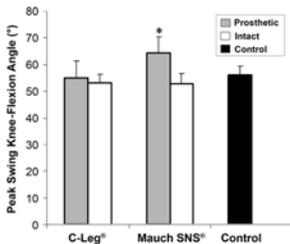


We used near-infrared spectroscopy (NIRS) to measure the cerebral oxygenation and blood volume of nondisabled subjects and subjects with traumatic brain injury (TBI) performing a rhythmic handgrip exercise on two separate occasions. Both groups' cerebral oxygenation and blood volume increased during the exercise. The changes were similar for both trials and cerebral oxygenation was significantly lower in subjects with TBI than in nondisabled subjects. These findings indicate that NIRS reliably and noninvasively evaluates cerebral oxygenation and blood volume changes during motor function and can monitor cerebral oxygenation recovery during rehabilitation.

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Kinematic and kinetic comparisons of transfemoral amputee gait using C-Leg[®] and Mauch SNS[®] prosthetic knees

Ava D. Segal, MS, et al.

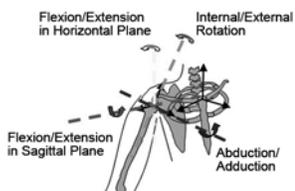


We compared the gait biomechanics of subjects wearing a microprocessor-controlled prosthetic knee to those of the same subjects wearing a common non-computerized prosthesis. This intrasubject randomized study compared the gait biomechanics

of transfemoral amputees wearing the C-Leg[®] (Otto Bock, Duderstadt, Germany) to a common noncomputerized prosthesis, the Mauch SNS[®] (Ossur, Reykjavik, Iceland). After subjects had a 3-month acclimation period with each prosthetic knee, typical gait biomechanical data were collected in a gait laboratory. The present study demonstrated minimal differences between the gait biomechanics of subjects walking with the C-Leg[®] vs the Mauch SNS[®] during constant speed ambulation at approximately transfemoral amputee self-selected walking speed. Scientific research that compares the efficacy of available prosthetic technology in normalizing amputee gait can assist the prosthetist in determining the optimal, most cost-effective prosthetic prescription for each amputee.

Effect of system tilt and seat-to-backrest angles on load sustained by shoulder during wheelchair propulsion

Guillaume Desroches, BSc, et al.



We determined the effect of system tilt angle (STA) and seat-to-backrest angle (SBA) changes on shoulder load during manual wheelchair propulsion. We tested combinations of three

STAs and three SBAs with 14 elderly subjects. Our analysis revealed no significant differences between shoulder moments (average and highest) for these STA and SBA combinations. We also found that keeping the wheel axle position constant to the subject's shoulder allowed modification of the seat without increased shoulder load. Therefore, wheelchairs can be positioned based on what offers the most user comfort, stability, and pressure-ulcer relief without increasing the risk of shoulder injury.

Magnetic resonance imaging technology in transtibial socket research: A pilot study

Arjan W. P. Buis, PhD, CPO, et al.

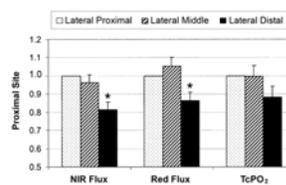


Investigations into the shape and volume of transtibial prosthetic sockets are complicated because of the difficulty in establishing an accurate reference grid. Magnetic resonance imaging (MRI) presents a possible solution to this problem. However, the reliability of MRI in defining the residual-limb/cast interface depends on the scanned image not being distorted by the materials present.

Distortion from the so-called "chemical shift" may influence the MRI image when certain materials are used during the casting process. These materials include plaster of paris and silicone (in the form of an interface liner). Experimental results indicated that the materials used do not distort or interfere with the scanned image and that extracting the bone structure and using it as a reference grid to quantify the differences in volume and shape of the soft tissues of the residual limb are feasible.

Preamputation evaluation of limb perfusion with laser Doppler imaging and transcutaneous gases

Stephen F. Figoni, PhD, RKT, et al.

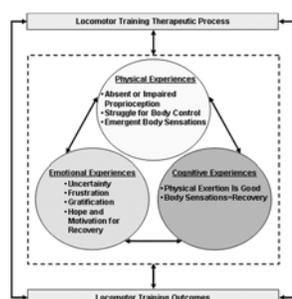


We compared preamputation assessments of leg ischemia with laser Doppler imaging (LDI) and transcutaneous partial pressure of oxygen (TcPO₂) and carbon dioxide (TcPCO₂) in 31 male

subjects with peripheral vascular disease (PVD) and severe leg ischemia and 29 age-matched male control subjects. TcPO₂ and TcPCO₂ were evaluated with Novamatrix monitors, and perfusion (flux) of skin topically heated to 44 °C and adjacent nonheated areas were evaluated with a Moor Instruments LDI scanner. LDI was superior to TcPO₂ in correctly discriminating between ischemic and nonischemic skin. The results suggest that an LDI ratio below 5 indicates nonviable skin. PVD is quite prevalent among veterans, and results in amputations, disability, and mortality. Availability of methods to quantify responses of skin vasculature will help in the early diagnosis and management of PVD.

Locomotor training: Experiencing the changing body

Elizabeth M. Hannold, PhD, et al.



We examined the experiences of locomotor training (LT) participants. LT is a promising therapy for improving walking in people with disabilities such as spinal cord injury (SCI) and stroke. Persons with incomplete SCI (I-SCI), including veterans, participated. They experienced bodily changes during LT,

became more aware of decreased or absent sensation, and struggled for bodily control. New sensations, such as burning and soreness, were also reported. These sensations were seen as positive signs of recovery and led to hope and motivation. Understanding the bodily changes that persons with I-SCI experience during LT may help therapists develop better patient-centered therapies.

Risk factors associated with mortality in veteran population following transtibial or transfemoral amputation

Barbara Bates, MD, et al.

We looked at mortality rates of veterans following an amputation because of diabetes or peripheral vascular disease. Having a better understanding of mortality risk in the months and years following this type of surgery is important for clinicians to be able to target rehabilitation services to the correct population. A balance between early intervention and longer-term goals is the key. High mortality rates attest to the frailty of the postamputation veteran population, and rehabilitation strategies targeted at enhancing the function of this population need to consider the shortened life span of many of these patients.

Cost of inpatient rehabilitation care in the Department of Veterans Affairs

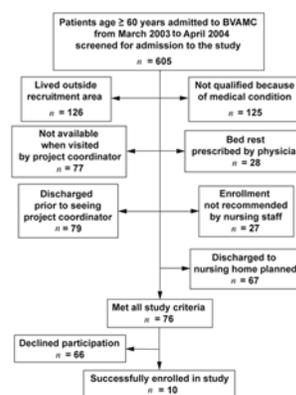
Todd H. Wagner, PhD, et al.

We investigated the determinants of inpatient rehabilitation costs in the Department of Veterans Affairs

(VA) and examined the relationship between length of stay (LOS) and discharge costs using data from VA and community rehabilitation hospitals. We obtained this information from the Health Economics Resource Center and Decision Support System National Data Extracts. LOS was a strong predictor of cost for VA and non-VA hospitals, while functional status at admission, measured by the Functional Independence Measure was statistically significant but added little explanatory value after controlling for LOS. Our analyses suggest that neither data set is ideal for research on VA rehabilitation care, but researchers conducting cost-effectiveness analyses in which rehabilitation is not a primary end point will probably find an average daily cost sufficiently precise. Researchers working in other clinical areas, such as stroke or fall prevention, may need more accurate cost estimates.

Exercise program implementation proves not feasible during acute care hospitalization

Cynthia J. Brown, MD, MSPH, et al.



Reports have demonstrated a high probability that older adults hospitalized for acute medical conditions will experience a decline in physical function. We investigated the feasibility of an inpatient followed by an in-home exercise program for patients with limited ambulatory ability at hospital admission. We designed our original pilot

study to be a randomized controlled trial involving an exercise group and a controlled group with a planned enrollment of 50 subjects. However, 10 were recruited and only 1 completed the 24-week exercise program. Qualitative interviews suggested that most patients believed exercise to be beneficial, but this interest did not translate into adherence to the study protocol. We concluded that this program was not feasible, but that an in-home exercise program implemented after hospital discharge may have a higher likelihood of success.

