

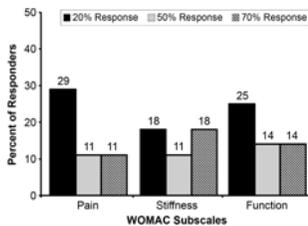
Location of plantar ulcerations in diabetic patients referred to a Department of Veterans Affairs podiatry clinic

Karen L. Perell, PhD, RKT, et al.

We described the location of foot ulcers through a chart review of diabetic patients in a Department of Veterans Affairs podiatry clinic and looked for connections between ulcer location and specific medical features. We hypothesized that individuals with diabetes rarely have heel ulcers but that heel ulcers are directly related to peripheral neuropathy and diminished vascular function. We found that patients with reduced vascular function were five times more likely to have heel ulcers than patients with adequate vascular function. The importance of understanding the risk factors for heel ulcers stems from a lack of available treatments. Further research should study the effectiveness of interventions for patients with reduced vascular status.

Effects of footwear on medial compartment knee osteoarthritis

Meika A. Fang, MD, et al.

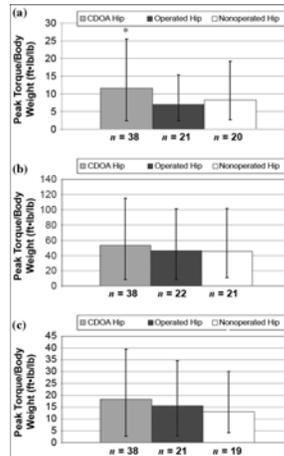


This pilot study investigated whether lateral-wedge insoles inserted into shock-absorbing walking shoes relieved pain and stiffness and improved walking in people with painful knee osteoarthritis. People with knee

pain in the medial knee compartment were asked to wear lateral-wedge insoles in lightweight cushioned walking shoes for 4 weeks. They answered questions about the amount of pain, stiffness, and problems with activity they had before wearing the insoles and after wearing them for 4 weeks. The results of this study showed that the lateral-wedge insoles decreased pain and stiffness and improved functional status in people with knee osteoarthritis. Pain was especially decreased for stair-climbing activities.

Isometric performance following total hip arthroplasty and rehabilitation

Karen L. Frost, PhD, et al.



We examined differences in strength between total hip arthroplasty (THA) patients and community-dwelling older adults to provide comparative data for therapists who treat THA patients. Studies based on self-report data indicate that THA surgery successfully alleviates pain and improves function relative to pre-surgical levels. However, studies based on objective performance-based measures indicate that despite postoperative improvements, THA patients continue to exhibit deficits in strength, postural stability, and gait.

Average hip strength during flexion (pushing upward) was significantly less for hip patients (in both their replaced and nonreplaced hip) compared with community-dwelling older adults. These deficits indicate that rehabilitation is not restoring THA patients to a level similar to their peers. Clinicians and therapists can use these results to improve current rehabilitation protocols.

Influence of a 6-week arm exercise program on walking ability and health status after hip arthroplasty: A 1-year follow-up pilot study

Jérôme Maire, PhD, et al.

This follow-up study of elderly patients after total hip arthroplasty (THA) examined the effect of our arm exercise program on health status and walking ability. Though THA had a major effect on our patients' physical fitness and functional status, the added effects of the training were significant on those outcomes at both 2 months and 1 year after surgery. In a 6-minute walk test, the training group (TG) walked significantly longer distance than the normal rehabilitation group with a faster speed, longer stride length, and higher step cadence. Therefore, besides an improvement in fitness, the TG also might have improved gait efficiency. These preliminary results suggest the importance of endurance-type upper-body aerobic training after THA.

Are patient ratings of chronic pain services related to treatment outcome?

Gabriel Tan, PhD, ABPP, et al.

We examined the relationships between ratings of services and outcomes of patients who received pain treatment at a teaching hospital. A group of 122 patients who completed a multidisciplinary pain-management program rated their satisfaction with and the effectiveness of services as well as changes in their pain condition and quality of life. The results indicated improvement on ratings of pain severity, pain interference, and depression. The patients' service ratings were significantly related to their outcomes; however, we found no significant change in disability. The results support the importance of assessing not only patients' satisfaction with treatment but also their perceived changes in disability, pain, and quality of life after pain-management services.

Using cranial electrotherapy stimulation to treat pain associated with spinal cord injury

Gabriel Tan, PhD, ABPP, et al.



Cranial electrotherapy stimulation (CES) sends microcurrents to the brain via electrodes clipped to the ears. CES can effectively treat spinal, head, dental, and muscle pain and control conditions associated with pain (anxiety, depression, insomnia, and stress). We studied how daily 1-hour active CES or sham CES treatment for

21 days affected pain in 38 males with spinal cord injury (SCI). The active CES group reported significantly greater decreases in daily pain intensity than the sham CES group. Our results suggest that CES can effectively treat chronic pain in people with SCI. We also found that people with SCI can and will use the CES device at home for a 3-week period.

Race/ethnicity: Who is counting what?

Huanguang Jia, PhD, et al.

We examined the racial/ethnic classifications of 1,084 veterans with stroke in Florida who received inpatient and outpatient services within the Department of Veterans Affairs (VA) healthcare system. We compared the reliability of racial/ethnic classifications from the VA inpatient data with the VA outpatient data and the VA data with Medicare data. Misclassification of race/ethnicity in research data may produce spurious conclusions if overlooked or ignored. Our results showed that the rate of unknown racial/ethnic classification in VA outpatient and inpatient data was high. We also found that black and white classifications in the VA data had stronger agreement with Medicare data and Medicare data may underrepresent Hispanic patients. Minimizing the unknowns by substituting known values from other data when available would greatly enhance the overall and individual classification reliability.

Treadmill training with harness support: Selection of parameters for individuals with poststroke hemiparesis

George Chen, PhD;Carolynn Patten, PhD, PT

Locomotor training with a treadmill and harness support is a promising, task-oriented approach to restoring gait function in individuals with poststroke hemiparesis. Considerable latitude exists in the application of locomotor training, and training protocols vary widely between experimenters and clinical settings. Recent studies indicate that the prescription of certain parameters, including body-weight support and treadmill speed, can affect treatment outcome in hemiparetic individuals. We reviewed the literature for studies that quantified the immediate effects of adjusting body-weight support, treadmill speed, support stiffness, and handrail hold during treadmill walking in hemiparetic and nondisabled subjects. We then summarized results from personal investigations of these parameters. Based on the currently available evidence, we discuss the scientific rationale for selecting certain training parameters for individuals with poststroke hemiparesis and outline future directions for research.

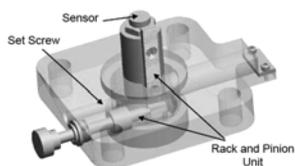
Caregiver distress in parkinsonism

David X. Cifu, MD, et al.

We examined the frequency and degree of caregiver burden in persons with parkinsonism (PWP). Supporting the functioning of caregivers is vital for the successful medical management of individuals with chronic illness and disability. Associations between perceived caregiver burden and physical, cognitive, and functional impairments were assessed with well-established tools for PWP. Caregiver burden was significantly negatively associated with activities of daily living and motoric difficulties, self-reported sleep, and caregiver coping ability. Results did not demonstrate an association among mentation, behavior, and mood or between patients' self-reported pain and caregiver burden. An improved understanding of the severity and correlates of caregiver burden in PWPs may allow clinicians to better prioritize treatment strategies for PWP and be more aware of the caregivers' needs.

A noncontact sensor for measurement of distal residual-limb position during walking

Joan E. Sanders, PhD, et al.

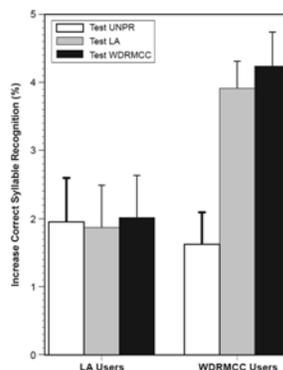


We developed a noncontact means of measuring position of the residual-limb surface relative to the distal prosthetic socket during walking in a transtibial amputee so the amount of slip,

or pistoning, between a limb and socket with different suspension systems for different activities could be evaluated. Results showed an average of 41.7 mm of displacement during swing phase relative to stance phase. A rest period caused the limb to displace in the socket approximately 4.8 mm during subsequent walking trials, possibly reflecting limb enlargement and thus a more proximal position in the socket after the rest period. This sensor could be used to identify systems that decrease limb-socket movement since excessive pistoning might detrimentally affect socket fit.

Acclimatization in wide dynamic range multichannel compression and linear amplification hearing aids

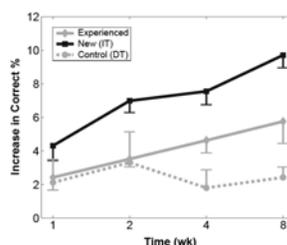
E. William Yund, PhD, et al.



We studied acclimatization in hearing-impaired patients with no previous hearing aid (HA) experience who were fit bilaterally with either wide dynamic range multichannel compression (WDRMCC) or linear amplification (LA) HAs. Throughout 32 weeks of normal HA use, we monitored changes in nonsense syllable perception in speech-spectrum noise. Syllable recognition for WDRMCC users improved by 4.6% over the first 8 weeks, but the 2.2% improvement for LA users was complete in 2 to 4 weeks. Consonant confusion analyses indicated that WDRMCC experience facilitated consonant identification, while LA users primarily changed their response biases. These results provide evidence for acclimatization in new users of WDRMCC HAs but not in new users of LA HAs. Acclimatization depended on the type of amplification and on the previous amplification experience.

Perceptual training improves syllable identification in new and experienced hearing aid users

G. Christopher Stecker, PhD, et al.

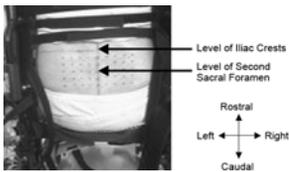


We investigated the effects of perceptual training on speech processing in new and experienced hearing aid (HA) users with sensorineural hearing loss. New HA users were randomly assigned to immediate training (IT) or delayed training (DT) groups. IT subjects underwent 8 weeks of syllable identification training and in-laboratory testing, whereas DT subjects underwent identical in-laboratory testing without training. Training produced large improvements in syllable identification in the IT group, whereas untrained DT group showed minimal improvement. DT group then underwent training and showed performance improvements comparable with IT subjects. We also tested experienced HA users using identical training and testing procedures as those used for new HA users. The experienced users also

showed significant performance improvements. Perceptual training appears to be a promising tool for improving speech perception in all HA users.

Interface pressure and cutaneous hemoglobin and oxygenation changes under ischial tuberosities during sacral nerve root stimulation in spinal cord injury

Liang Qin Liu, MB, et al.

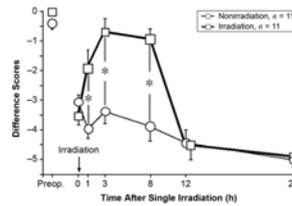


We studied how neuromuscular stimulation through a magnetic coil and a sacral anterior root stimulator (SARS) implant (used for bladder emptying) affects pressure and skin blood circulation

under the ischial tuberosities (ITs) of participants with spinal cord injury (SCI). The ITs are the most common site for pressure ulcers among wheelchair users with SCI. With optimal stimulation through a magnetic coil, average IT peak pressure and gradient at peak pressure decreased significantly in five seated participants with SCI. Similar results were achieved in six seated participants with SCI during sacral nerve stimulation through their SARS implants. Results indicated that stimulation caused enough gluteal muscle contraction to significantly change the participants' pressures while they sat. In addition, long-term stimulation through a SARS implant may build up the gluteal muscles and help prevent or reduce pressure ulcers in people with SCI.

Antinociceptive effect of linear polarized 0.6 to 1.6 μm irradiation of lumbar sympathetic ganglia in chronic constriction injury rats

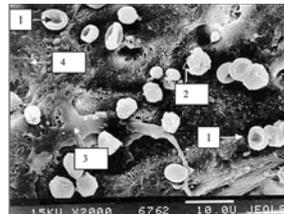
Hiroshi Muneshige, MD, PhD (deceased), et al.



Linear polarized near-infrared light has been used to treat various painful disorders. We examined the effects of irradiation applied to an area near the lumbar sympathetic ganglia on the ligated side in a chronic constriction injury model in rats, which is believed to be an animal model of complex regional pain syndrome (CRPS). We believe the results of this study are relevant to the effect of irradiation for patients with upper-limb CRPS: that irradiation near the lumbar sympathetic ganglia of the rat is effective for thermal, but not mechanical, pain.

Skin and bone integrated prosthetic pylon: A pilot animal study

Mark Pitkin, PhD, et al.



Direct skeletal attachment of limb prostheses is an alternative to traditional techniques based on a socket-residuum attachment. We investigated cell adhesion and penetration into the pores of a porous titanium pylon in rats.

We hypothesized that the risk of skin infection during direct attachment of limb prostheses might be reduced with this type of pylon. Electronic scanning and morphological analysis showed that the porous titanium pylon integrated with the surrounding skin. Therefore, developing a natural barrier against the infection associated with direct skeletal attachment of limb prostheses may be possible. We preliminarily conclude that the experimental porous pylon provided an inviting environment for the surrounding tissues.