

Prior housing conditions and sleep loss may affect recovery from brain injury in rats: A pilot study

Ronald G. Riechers, MD, et al.

The military combat environment is associated with prolonged periods of sleep deprivation and high risk for brain injury. This study tests the hypothesis that recovery of sensorimotor function following a brain injury is affected by preinjury environmental conditions or potential stressors. While chronic sleep deprivation is likely to exert detrimental effects on outcome, data presented here suggest that the negative effect of preinjury environmental stressors on functional recovery from brain injury may be attenuated by acute sleep deprivation. Future studies should consider the combat environment in order to better understand the complexities associated with brain injuries common in returning servicemembers. <http://dx.doi.org/10.1682/JRRD.2012.04.0061>

Driving simulator performance of Veterans from the Iraq and Afghanistan wars

Melissa M. Amick, PhD, et al.

Veterans of Operation Iraqi Freedom/Operation Enduring Freedom commonly report worsening driving skills postdeployment. Performance on a virtual reality driving simulator assessment was examined in this cohort. We found that Veterans performed more poorly on the driving simulator assessment than an age- and education-matched civilian group. Furthermore, among Veterans, increasing symptoms of posttraumatic stress disorder were associated with poorer driving simulator performance. We plan to use these findings to identify unsafe drivers and to inform future treatments to improve driving safety. <http://dx.doi.org/10.1682/JRRD.2012.06.0108>

Use of group treatment among case managers in Department of Veterans Affairs supported housing program

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The Department of Housing and Urban Development-Department of Veterans Affairs Supported Housing (HUD-VASH) program provides homeless veterans with a housing voucher and intensive case management. However, the use of group treatment in HUD-VASH has not been examined. This study examined national HUD-VASH data and found that HUD-VASH programs that offered groups more often had more contacts with their clients. Furthermore, an online survey of HUD-VASH case managers in the New England area found most case managers reported groups could be helpful for their clients. The results of this study suggest that group treatment in HUD-VASH has the potential to improve care for homeless veterans and should be further studied. <http://dx.doi.org/10.1682/JRRD.2012.04.0073>

Patient repositioning and pressure ulcer risk—Monitoring interface pressures of at-risk patients

Matthew J. Peterson, PhD, et al.

Repositioning patients regularly to prevent pressure ulcers and reduce interface pressures is the standard of care. This study examined how effective patient repositioning is at unloading pressure around the buttocks area of bedridden patients. The results showed that at-risk patients have skin areas that are likely always at risk throughout their hospital stay despite repositioning. Healthcare providers are unaware of the tissue-relieving effectiveness of their repositioning technique, which may partially explain why pressure ulcer prevention methods are not always successful. Repositioning does help relieve at-risk tissue and is a necessary part of pressure ulcer prevention, but the repositioning practice could be improved. <http://dx.doi.org/10.1682/JRRD.2012.03.0040>

Role of sensory and motor intensity of electrical stimulation on fibroblastic growth factor-2 expression, inflammation, vascularization, and mechanical strength of full-thickness wounds

Mohammad Reza Asadi, MSc, et al.

Electrical stimulation (ES) may be clinically applicable for angiogenesis by stimulating the formation of angiogenic factors. We evaluated the effect of sensory and motor intensities of cathodal current on the release of fibroblastic growth factor-2 (FGF-2) at the wound site and also the biomechanical and histological properties of healed skin. The results showed that skin FGF-2 levels in the sensory group were significantly greater than that in the other groups on the third day. The motor ES induced an increase in the proliferation of collagen and improved the biomechanical properties of the healed skin. It seems that the different intensities of ES should likely be applied for the different stages of healing to obtain optimal effects.

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Muscle activity during stance phase of walking: Comparison of males with transfemoral amputation with osseointegrated fixations to nondisabled male volunteers

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A small number of patients with traumatic above-knee amputations have received direct skeletal fixations in the United Kingdom. This approach permits direct attachment of the prosthesis to a titanium rod protruding from the thigh bone. The advantage of this technique is reduction of socket-related problems, improved hip mobility, and ease of attachment and removal of the prosthesis. This study focuses on muscle function in the residual limb of five subjects during walking. Results indicate that all muscles retain function similar to that of the subjects with intact limbs. Additionally, walking speed was greater than reported in subjects with conventional prostheses.

<http://dx.doi.org/10.1682/JRRD.2011.10.0204>

Long-term activity in and among persons with transfemoral amputation

Elizabeth G. Halsne, CPO, et al.

Limb loss greatly affects the lives of those that experience it. The majority of previous limb-loss research has been conducted in laboratory settings. Little is known about how limb loss affects persons with amputation in their homes and communities. Here, step counts of persons with above-knee limb loss were studied to describe monthly, seasonal, and yearly patterns. This study showed that persons with limb loss are greatly restricted in their regular activity. Daily activity was highly variable and changed by month and season.

<http://dx.doi.org/10.1682/JRRD.2012.04.0066>

Bilateral electromyogram response latency following platform perturbation in unilateral transtibial prosthesis users: Influence of weight distribution and limb position

David Rusaw, PhD, et al.

Afferent sensory information is important for maintenance of postural stability in response to an external balance threat. Individuals with a limb amputation lack the sensory information that used to be provided by their anatomical limb. This study subjected transtibial prosthesis users to sudden movements of the surface they were standing on and measured how quickly they responded with the muscles of their lower limb. The results indicate individuals with an amputation respond slower than age-matched nondisabled individuals to sudden movements of the support surface.

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Cycling exercise to resist electrically stimulated antagonist increases oxygen uptake in males: Pilot study

Hiroo Matsuse, MD, et al.

We developed a hybrid training system (HTS) that combines electrical stimulation and volitional contractions; it uses the electrically stimulated eccentric antagonist muscle contractions as a resistance to voluntary agonist muscle contractions. This study evaluated the difference in oxygen uptake kinetics between HTS and volitional contractions. The results showed that HTS could significantly increase oxygen uptake. HTS is a new technique that may increase metabolic cost by using the combined stimulation and contractions as exercise resistance to voluntary agonist muscle contractions.

<http://dx.doi.org/10.1682/JRRD.2012.04.0067>

Changes in passive ankle stiffness and its effects on gait function in people with chronic stroke

Anindo Roy, PhD, et al.

People who have had a stroke often have abnormally stiff joints in their affected limb. In this article, we report the effects of a 6 wk training program with a new ankle robot (anklebot) on the stiffness of the affected ankle in people with stroke greater than 6 mo from onset. Eight individuals with lasting weakness from a stroke played a video game while seated for 1 h (three times/wk) by moving their affected ankle “up” or “down” with the robot assisting “as needed.” The stiffness of the weak ankle was measured, both before and after participation in the study, by slowly stretching the ankle in different directions using the anklebot, while subjects were seated in a relaxed state. We found that at 6 wk, the stiffness of the affected ankle decreased in the up and down directions and became similar to those of nondisabled people of similar age in the up direction. Importantly, decreased stiffness of the affected ankle led to improved quality of walking over ground. These findings suggest that

measuring and monitoring ankle stiffness over the course of a therapy program can provide important insight into the process of neurorecovery and assist in tracking recovery.

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Evaluating psychoacoustic measures for establishing presence of tinnitus

James A. Henry, PhD, et al.

The Department of Veterans Affairs considers tinnitus a disability. Veterans can claim tinnitus as a “service-connected” disability if the tinnitus is thought to be related to military service. Determining whether a person actually has tinnitus depends only on the person’s verbal report. This study developed a test for determining if a person has tinnitus as he or she claims. Using our computer-automated tinnitus evaluation system, we compared different measures of tinnitus between people with versus without tinnitus. Some differences were seen between groups, suggesting that further efforts can produce a defined test battery for identifying the presence of tinnitus.

<http://dx.doi.org/10.1682/JRRD.2012.05.0090>

Hearing aid effectiveness after aural rehabilitation: Individual versus group trial results

Margaret P. Collins, PhD, CCC-A, et al.

We studied whether group hearing aid visits were at least as effective as individual visits and whether group visits led to cost savings. We recruited 644 hearing aid patients from the Department of Veterans Affairs Puget Sound Health Care System. We measured patient outcomes and costs for 6 mo after the hearing aid fitting. We found that group hearing aid fitting and follow-up visits were at least as effective as individual visits and resulted in important cost savings.

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