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## ULTRASOUND IN CARPAL TUNNEL SYNDROME WITH NORMAL NERVE CONDUCTION STUDIES

Carpal tunnel syndrome (CTS) is typically confirmed by nerve conduction studies (NCS). However, recently, it has been demonstrated that high-resolution sonography can detect an absolute or relative enlargement of the median nerve proximal to the edge of the flexor retinaculum in cases of CTS. This study further assessed the utility of ultrasound for patients with clinically definite CTS who have normal NCS results.

This prospective, blinded, cross-sectional study included 35 patients with clinically definite CTS and normal NCS results, as well as 20 healthy, matched controls. All subjects underwent neurologic testing, including provocative testing for CTS, sensorimotor examination and routine median and ulnar NCS. Using a high resolution sonography, the median nerve cross-sectional area (CSA) was measured at the level of the pisiform bone. In addition, the flexor retinaculum thickness (FRT) was measured.

The mean CSA was significantly higher in the patients with clinical CTS than in the control patients (p=0.001), with 17 of 35 patients and one of 20 controls demonstrating a CSA above 9.5 mm² (p=0.001). In addition, FRT was significantly greater in the CTS patients than in the control patients (p= 0.001).

**Conclusion:** This study of patients with clinically definite carpal tunnel syndrome who had normal nerve conduction studies found that half of the cases could be confirmed by high-resolution ultrasound.

Al-Hashel, Y., et al, Sonography in Carpal Tunnel Syndrome with Normal Nerve Conduction Studies. **Muscle Nerve.** 2015, April; 51(4): 592-597.

## BETA BLOCKERS AND PNEUMONIA AFTER ISCHEMIC STROKE

Increased sympathetic activity has been repeatedly observed in acute stroke, with this activity related to poorer outcomes. In addition, sympathetic hyperactivity has been suggested to play a central role in poststroke immune depression, resulting in increased susceptibility to infection.This study examined the effects of beta blocker (BB) exposure on mortality, and functional outcome, as well as the occurrence of pneumonia after ischemic stroke.

Data were abstracted from the Virtual International Stroke Trials Archive (VISTA) database concerning patients hospitalized with ischemic stroke. This database included demographic and clinical variables, past medical history and treatment during hospitalization. Data were searched for medication use as well as adverse events, including pneumonia.

Data from 5,212 patients, with a mean age of 67 years, were available for analysis. Of these 1,155 had been treated with BBs before stroke onset. Within three days of stroke onset, 244 began treatment with BBs, 192 of whom received selective beta-1 and 52 nonselective BBs. After adjusting for confounders, those introduced to BBs during hospitalization had a reduced mortality at three months (relative risk (RR) 0.63). A significant effect was noted for beta-1 selective BBs (RR 0.48), but not for nonselective beta blockers (RR 1.10). Pneumonia occurred in 8.2% of the subjects within 10 days of admission, with pre-hospital as well as hospital initiated BB use associated with a reduced frequency of pneumonia (RR of 0.77 and 0.49 respectively).

**Conclusion:** This large nonrandomized study of patients hospitalized with acute ischemic stroke found that the use of beta blockers, when introduced during hospitalization, is associated with reduced mortality, especially among those receiving beta-1 selective beta blockers. A reduced risk of pneumonia was also noted among those treated with beta blockers.

Sykora, M et al. Beta Blockers, Pneumonia, and Outcome after Ischemic Stroke. Evidence from Virtual International Stroke Trials Archive. **Stroke.** 2015, May; 46:1269 – 1274

## SAUNA BATHING AND ALL CAUSE MORTALITY

While sauna bathing has been associated with improved cardiovascular and circulatory function, the association between regular sauna bathing and the risk of sudden cardiac death (SCD) and fatal cardiovascular diseases is not yet known. This prospective study investigated the association between exposure to sauna bathing and mortality in a male population.

This study involved a population-based sample of men from Eastern Finland, 40 to 60 years of age. All participants underwent an assessment of cardiac risk factors with sauna bathing assessed by self-administered questionnaires, reviewing frequency of sauna bathing, session duration and temperature. Baseline data were obtained from 1984 through 1989, with follow-up data reviewed until 2011. All deaths were reviewed and classified.

Data were reviewed for 2,315 males with a mean age of 53 years and a mean body mass index of 26.9 kg/m$^2$. The mean frequency, duration, and temperature of sauna bathing were 2.1 times per week, 14.2 minutes per session, and 78.9°C, respectively. At a mean follow-up of 20.7 years, compared to those participating once per week, the hazard ratio for sudden cardiac death was 0.78 for those bathing two to three times per week, and 0.37 for

those bathing four to seven times per week (p= 0.005).Significant, inverse associations were found between the duration of sauna bathing and mortality due to CHD (p=0.007), as well as CVD (p=0.03). The greatest benefit was found among those bathing over 19 minutes per session. Frequency of sauna bathing, but not duration, was inversely associated with all-cause mortality, with a 40% reduction seen among those participating four to seven times per week, as compared to those with one session per week.

**Conclusion:** This Finnish study found an inverse relationship between all-cause mortality and the frequency of sauna bathing among males.

Laukkanen, T., et al. Association between Sauna Bathing and Fatal Cardiovascular and All-Cause Mortality Events. **JAMA Int Med**. 2015, April; 175(4): 542-548.

## SPHENOPALATINE GANGLION BLOCK FOR ACUTE HEADACHE

As recent evidence has implicated the sphenopalatine ganglion as an important neural relay for migraine, a block of this ganglion is thought to be a potential treatment option. This study evaluated the efficacy of a sphenopalatine ganglion block for the treatment of acute frontal headaches in patients presenting to an emergency department.

Subjects were patients ages 18 to 65 years of age, presenting to an emergency department with a frontal-based headache and a normal neurologic examination. The subjects were randomized to receive 0.3 ML of either saline (control), or 0.5% bupivicaine, applied by catheter to the sphenopalatine ganglion. The subjects were assessed for headache pain at baseline, and at five and 15 minutes after intervention. The predefined, primary endpoint was a 50% absolute pain reduction at 15 minutes. Secondary outcomes included a reduction of pain by more than 19 mm on a 100 mm visual analogue scale.

A total of 93 patients were enrolled in this study, with 45 randomized to the bupivicaine group and 48 to the normal saline group. A total of 48.8% of the treatment group enjoyed a 50% reduction in pain as compared to 41.3% of the saline group, resulting in a nonsignificant difference. At 15 minutes, the median VAS headache score for the treatment group was 34 and that for the saline group was 51.5. At 24 hours, among those available for follow-up, 72.2% of the bupivicaine treated, and 47.5% of the saline treated patients were headache and nausea free.

**Conclusion:** This emergency department study of patients presenting with acute frontal headache found that a sphenopalatine ganglion block did not reduce the proportion of patients with a 50% or greater reduction in headache severity , although the treatment did result in better 24-hour outcomes.

Schaffer, J., et al. Noninvasive Sphenopalatine Ganglion Block for Acute Headache in the Emergency Department: A Randomized, Placebo -Controlled Trial. **Ann Emerg Med**. 2015, May; 65(5): 503-510.

## AUTONOMIC DYSFUNCTION WITH PERSISTENT POSTCONCUSSION SYMPTOMS

Concussions are common in children and adolescents, with most recovering within seven to 10 days. An association has been found between specific concussion symptoms and protracted recovery, with dizziness suggest to be a potential predictor of this persistence. This study was designed to characterize orthostatic intolerance among young patients with persistent postconcussive symptoms.

This prospective study included patients, 13 to 18 years of age, referred to a pediatric neurology headache clinic for management of postconcussive symptoms. All subjects complained of ongoing symptoms, including lightheadedness, at three weeks to six months post-injury. All participants were assessed for symptoms on the day of evaluation, and underwent a head-upright tilt table (HUT) study. At that evaluation, 70.6% had abnormal results, with isolated syncope in 29.4%, and postural tachycardia syndrome (POTS) in 41.2%. The HUT test scores were compared to the postconcussive symptom scores.

Fifty percent of the patients with POTS also demonstrated syncope or intermittent syncope between five and 10 minutes of testing. Patients with POTS had higher lightheadedness

ratings than did the normal and syncope group (p<0.001). Patients with POTS also had higher post-concussion scores than did normal patients (p<0.001). At follow-up, nine of 12 patients no longer met the POTS diagnostic criteria.

**Conclusion:** This study of adolescents with persistent postconcussive symptoms found that the majority had evidence of autonomic dysfunction, revealed by head-upright tilt table testing.

Heyer, G., et al. Orthostatic Intolerance and Autonomic Dysfunction in Youth with Persistent Postconcussion Symptoms: A Head Upright Tilt Table Study. **Clin J Sp Med.** 2015. DOI: 10.1097/ JSM.0000000000000183

## BOTOX DECREASES CALCITONIN GENE RELATED PEPTIDE IN CHRONIC MIGRAINES

A significant portion of patients with chronic migraine (CM) do not respond effectively to preventative medications alone or in combination. OnabotulinumtoxinA was approved for the prevention of CM in 2010. Changes from within the brain are thought to activate the trigeminovascular system, which results in the local release of vasoactive neuropeptides from presynaptic nerve terminals. These include calcitonin gene related peptide (CGRP) , vasoactive intestinal peptide (VIP), or pituitary adenylate cyclase activating polypeptide (PACAP). This release induces vasodilation and neurogenic inflammation, giving rise to pulsating migraine pain. This study was designed to determine whether treatment with OnabotulinumtoxinA induces changes in plasma CGRP concentrations.

Subjects were 83 patients with chronic migraine who had failed, because of either poor efficacy and/or tolerability to treatment with at least two prophylactic medications. The patients were maintained on prior oral preventative medications and received OnabotulinumtoxinA injections at least twice during a 12 week period. Levels of CGRP were determined before and one month after treatment.

The level of CGRP after OnabotulinumtoxinA treatment was significantly decreased as compared to baseline (p<0.001). Sixty-four of the patients responded, while 19 did not notice any change. Pretreatment CGRP levels of the responders were significantly higher than of those of the nonresponders (p<0.001). One month after treatment, CGRP levels did not change in non-responders, but significantly decreased in responders (p=0.003).

**Conclusion:** This study of patients with chronic migraines suggests that a mechanism of action of the treatment is the reversal of peripheral and central sensitization, resulting from the inhibition of the release of calcitonin gene related peptide.

Cernuda-Morollo, E et al**.** OnabotulinumtoxinA decreases Interictal CGRP Plasma Levels in Patients with Chronic Migraine. **Pain**, 2015, May; 156(5): 820 – 824.

## HEARING IMPAIRMENT AND COGNITIVE DECLINE

Previous epidemiologic studies have suggested an association between hearing impairment and cognitive decline. This study used data from the Atherosclerosis Risk in Communities (ARIC) study to further assess the effects of hearing loss on cognitive decline.

This population-based, prospective, cohort study included 15,792 individuals, 45 to 64 years of age, recruited between 1987 and 1989. A pilot study concerning hearing was initiated at one site, with audiometric testing offered to 307 participants. A comprehensive neuropsychological battery was administered at baseline and twice again, with the last in 2013. In addition, demographic and health data, including depressive symptoms, were reviewed.

Of the 253 participants, 29% had no hearing loss, 37% had mild hearing loss and 34% had moderate or severe hearing loss. At 20-year follow-up, neuropsychological test scores were worst for participants with moderate to severe hearing loss, and best for those with no hearing loss. After adjusting for demographic and disease covariates, compared to those with no hearing loss, those with moderate to severe hearing loss declined more rapidly on the Delayed Word Recall Test (memory) and the Global Composite scores. Among those with the worst hearing loss, 20-year changes were greater for hearing aid nonusers than for users.

**Conclusion:** This study demonstrates an association between moderate to severe hearing loss and memory performance, with this association strongest among those with moderate to severe hearing loss who reported not wearing a hearing aid.

Deal, J., et al. Hearing Impairment in Cognitive Decline: A Pilot Study, Conducted within the Atherosclerosis Risk in Communities Neurocognitive Study. **Am J Epidem.** 2015, May 1; 181(9): 680-690.

## COGNITIVE TRAINING AND LONG-TERM STRUCTURAL, PLASTIC CHANGES IN HEALTHY SENIORS

A growing body of evidence supports the efficacy of cognitive training (CT) on the neuropsychological outcomes of healthy aging individuals. Most studies of this training have failed to explore the temporal dynamics of CT-induced neurobiological effects. This study was designed to better understand the effects of this training.

This study used a subset of participants from the Timecourse Trial, a randomized, controlled trial of group-based, multi-domain, computerized, cognitive training (CCT) in healthy, older adults. Seven subjects were randomized to the intervention group, receiving exercises of memory, attention, response speed, executive function and language, one hour, three times per week. Five subjects were randomized to an active control intervention. Multimodal MRI scans were performed at baseline, and then after nine and again after 36 training sessions, using the COGPAK cognitive training suite. The primary outcome measure was change in global cognition.

Twelve subjects were included in the final analysis. A significant group × time interaction was noted for the CCT group as compared to the control group across the 3-month trial (p=0.003*)*. A significant group × time interaction was also noted in the right post-central gyrus, indicating increased gray matter density in the CCT group, as compared to the active control, at both follow-up periods (p=0.003). Strong correlations were found between this change and improved global

cognition. More than half of the structural changes in the CCT group were observed after three weeks of training.

**Conclusion:** This study demonstrates structural changes of the brain, associated with computerized cognitive training, in healthy older adults.

Lampit, A., et al. Cognitive Training-Induced Short-Term Functional and Long-Term Structural Plastic Change is Related to Gains in Global Cognition in Healthy Older Adults: A Pilot Study. **Front Aging Neurosci.** 2015, March 9: doi.org/10.3389/fnagi.2015.00014

## MULTIVITAMIN USE AND STROKE MORTALITY

Prospective studies have shown that a high consumption of fruits and vegetables is associated with a reduced risk of stroke, while individual nutrients, including vitamin C, folate, magnesium and potassium may have beneficial effects on stroke prevention. This study examined the association between multivitamin use and the risk of death from stroke.

The Japan Collaborative Cohort Study was designed to evaluate the effects of lifestyle factors on the health of Japanese men and women. A total of 110,585 men and women, ages 40 to 79 years, completed questionnaires concerning demographics, medical history, lifestyle factors and diet. Patients were asked about multivitamin use, defined as regular if used every day and casual if used occasionally. The participants were followed to determine mortality from stroke and other causes.

Among 72,180 participants, 13.1% used multivitamin supplements. During the median 19.1 -year follow-up, 2,087 deaths due to stroke were identified. After adjusting for potential confounders, as compared to nonuse, multivitamin use was associated with a reduced risk of death from total stroke (hazard ratio 0.87; p=0.07) and ischemic stroke (hazard ratio 0.8; p=0.06). In a subgroup analysis, the risk of stroke was reduced with multivitamin use among those who had a fruit and vegetable intake of less than three servings per day, but not among those with higher intake.

**Conclusion:** This prospective, Japanese, cohort study found that frequent multivitamin use is associated with a lower risk of total and ischemic stroke mortality among those with a low intake of fruits and vegetables.

Dong, J., et al. Multivitamin Use and Risk of Stroke Mortality. The Japan Collaborative Cohort Study. **Stroke;** 2015, May;46(5): 1167-1172.

## MILD ACUTE ISCHEMIC STROKE AND TPA

While current guidelines recommend treatment with intravenous thrombolysis for eligible patients with acute ischemic stroke, fewer than five percent of all patients with acute ischemic stroke receive thrombolytics. Mild or rapidly improving stroke symptoms are the most common reason for a lack of treatment in eligible patients. This study sought to further clarify the efficacy of thrombolysis within 4.5 hours of the onset of mild ischemic stroke.

This study employed data from the Get with the Guidelines Stroke Registry (GWTG-Stroke), using data from participants diagnosed with acute ischemic stroke, admitted between 2010 and 2012. Each had a National Institutes Of Health Stroke Scale Score of five or below, and was treated within 4.5 hours of symptom onset.

Data were collected concerning 5,910 patients from 966 hospitals. Of these, 98.2% had arrived within three hours of onset, and 78.6% were treated in the zero- to three-hour window. Among these patients, mortality was 1.3%, and symptomatic intracerebral hemorrhage occurred in 1.8%. Of those treated, 29.4% could not be discharged directly to home, 30.3% were unable to ambulate independently and 73% had a length of stay of three days or longer. The outcome of independent ambulation at discharge was similar between those treated within three hours versus those treated within the 3 to 4.5 hour window.

**Conclusion:** This retrospective study clarified the effect of thrombolysis for patients with mild acute ischemic stroke, demonstrating a relatively low complication rate.

Romano, J., et al. Outcomes in Mild, Acute Ischemic Stroke Treated with Intravenous Thrombolysis. A Retrospective Analysis of the Get with the Guidelines Stroke Registry. **JAMA Neurol.** 2015, April; 72(4): 423 -431.

## ELECTRICAL STIMULATION FOR DYSPHAGIA AFTER BRAIN INJURY

Oropharyngeal dysphagia is frequently present during the acute phase of acquired brain injury, stroke and traumatic brain injury (TBI). Neuromuscular electrical stimulation (NMES) is a therapeutic procedure approved by the FDA as a treatment for dysphagia. As previously published studies have yielded conflicting results, this trial sought to further clarify the effectiveness NMES for the treatment of subacute oropharyngeal dysphagia due to acquired brain injury.

This prospective randomized study included 20 patients with stroke and or TBI with videofluoroscopy demonstrated tracheal aspiration. The subjects were randomized to receive either NMES or sham electrical stimulation for four weeks. Each patient received 20 sessions of NMES, five per week, with each session lasting 60 minutes. At the end of treatment and at three month follow-up the participants underwent clinical videofluoroscopy, and esophageal manometric evaluation. Swallowing capacity was evaluated using the Functional Oral Intake Scale (FOIS).

At one month, feeding capacity as measured by FOIS scores increased by 2.9 points in the NMES group and by one point in the sham group (p=0.0005). At three months the mean FOIS value was 5.3 in the NMES and 4.6 in the sham group, an insignificant difference. At one month follow-up, there was no significant difference in the reduction of patients with tracheal aspiration, though a significant improvement was observed in the NMES group regarding the bolus viscosity at which aspiration appeared (p=0.015).

**Conclusion:** This study of patients with acquired brain injury found that neuromuscular electrical stimulation may shorten recovery time and improve swallow function.

Terr,R et al A Randomized Controlled Study Of Neuromuscular Electrical Stimulation and Oropharyngeal Dysphagia Secondary to Acquired Brain Injury. **Euro J**

**Neurol** 2015,April; 22(4):687 – 696.

### EARLY OSTEOARTHRITIS AFTER ACL RECONSTRUCTION

Previous studies have suggested that the prevalence of knee osteoarthritis (OA) is as high as 90% one decade after anterior cruciate ligament (ACL) injury. This study assessed the prevalence of knee OA one year after ACL repair.

Subjects were 111 consecutive patients, 18 to 50 years of age, with ACL injury, all of whom had undergone a single bundle hamstring tendon autograph ACL repair. In addition, 20 uninjured, asymptomatic, matched controls were recruited for comparison. All patients underwent MRI at baseline and at one-year follow-up. These MRIs were read by a musculoskeletal radiologist who determined the presence or absence of OA. Preoperative scans were unavailable for analysis.

At one-year follow-up, the MRIs demonstrated that 31% of the participants had knee OA. Of those, 19% had tibiofemoral OA and 17% had patellofemoral OA. None of the controls demonstrated OA. Those who underwent a partial meniscectomy at the time of repair were more likely to have tibiofemoral OA than those who did not. A body mass index of over 25 kg/m² was associated with an increased risk of tibiofemoral osteophytes and patellofemoral bone lesions. Older age and male gender were associated with a significantly elevated risk of patellofemoral OA and osteophytes.

**Conclusion:** This study of patients undergoing anterior cruciate ligament repair found that, at one year, 31% demonstrated evidence of osteoarthritis of the knee.

Culvenor, A., et al. Early Knee Osteoarthritis is Evident One Year following Anterior Cruciate Ligament Reconstruction. A Magnetic Resonance Imaging Evaluation. **Arthritis and Rheum.** 2015, April; 67 (4): 946-955.

### HIGH-RESOLUTION ULTRASOUND FOR DETECTING MENISCAL TEARS

Meniscal tears are common in athletes and nonathletes, resulting in pain and disability. While magnetic resonance imaging is the first-line diagnostic modality for the detection of these tears, it is costly, and, for some patients, contraindicated. Noting recent developments in ultrasound(US) technology, this study's authors assessed the accuracy of high-resolution US for diagnosing meniscal abnormalities, including tears. Patients with knee pathology, scheduled for arthroscopic evaluation/treatment, were evaluated preoperatively with a high-resolution US, with a six to 14 MHz linear transducer. Meniscal tears were characterized as horizontal, vertical, radial, flap, bucket handle or complex. The diagnosis by US was compared with findings at the time of arthroscopic repair. In a separate study, cadavers were used to evaluate the area of the meniscus visible to ultrasound.

Subjects were 70 patients, with 33 undergoing ACL reconstruction, 38 meniscectomy, six meniscal repair, five microfracture, one synovectomy and one tumor resection. Compared to the arthroscopic findings, the sensitivity of the ultrasound was 88%, specificity 85%, positive predictive value 85% and negative predictive value 88%. Gender, age and body mass index did not appear to affect the results of ultrasound. The sensitivity and negative predictive values for the detection of lateral meniscal tears were low. In the cadaveric study, 89% of the meniscus was visible, with all areas except the anterior horn visible.

**Conclusion:** This study of patients scheduled for surgical repair of knee pathology found that high-resolution ultrasound has a relatively high accuracy for the detection of meniscal tears, with the exception of those in the anterior lateral horn.

Akatsu, Y., et al. Accuracy of High-Resolution Ultrasound in the Detection of Meniscal Tears and Determination of the Visible Area of Meniscus. **J Bone Joint Surg.** 2015, May 20; 97(10) :799-806.

### SYNOVIAL STEM CELLS FOR KNEE CARTILAGE DEFECTS

Articular cartilage injuries are a common clinical problem, which left untreated, may lead to osteoarthritis (OA). Previous studies of mesenchymal stem cells (MSCs) have shown that synovial MCSc have superior chondrogenic ability compared with MSCs from other tissues. This study assessed the efficacy of synovial MSCs for the treatment of singular cartilage defects.

Subjects were10 patients, ages 20 to 43 years, with symptomatic, single cartilage defects of the femoral condyle. All patients underwent ACL reconstruction and two received meniscal sutures. Synovium was harvested from the suprapatellar pouch for MSC culturing. At surgery, the injured cartilage was degraded arthroscopically, with synovial MSCs placed over the defect for 10 minutes. Follow up evaluations included MRI examination with a second look arthroscopy completed for patients with discomfort. A needle biopsy was performed at the center of the repaired cartilage. Clinical outcomes were assessed using the Lysholm score and Tegner activity level scales.

MRI scores for cartilage defects increased after treatment for all 10 patients (p=0.005). Lateral femoral condyle defects were incompletely healed in one patient whose lateral meniscus had been completely removed. Lysholm knee scores improved after treatment for all patients (p=0.005), while the Tegner activity scores did not.

**Conclusion:** This small case series found that transplantation of synovial mesenchymal stem cells may be effective for the treatment of cartilage defects of the knee.

Sekiya, I et al. Arthroscopic Transplantation of Synovial Stem Cells Improves Clinical Outcomes in Knees with Cartilage Defects. **Clin Ortho and Rel Res.** 2015, April 30:10:.1007/s119999-015-4324-8

### TOTAL CONTACT INSOLES FOR PLANTAR FASCIITIS

Plantar fasciitis is characterized by pain and stiffness in the heel and medial arch of the foot. While insoles are often prescribed as a treatment, little is known about the relative effects of prefabricated and custom made insoles. This study assessed the efficacy of custom made insoles on pain, function, distribution of load, gait, quality of life and satisfaction.

This double-blind, placebo-controlled trial included 74 patients with plantar fasciitis. The patients were randomized to receive either custom-made insoles (treatment

group), or flat insoles (control group). Insole use was titrated up to daily wear for six months. Subjects were assessed at baseline and at 45, 90 and 180 days using a visual analogue scale for pain, 6 minute walk test, the foot function index, the foot health status questionnaire, the medical outcomes study short form – 36 and a Likert scale for patient satisfaction.

Significant improvement in pain while walking was documented in the treatment group, as compared to the control group (p=0.008). Both groups demonstrated improvement, with no difference between groups for pain at rest, foot pain, foot function, general foot health, general health and physical activity subscales of the foot health status questionnaire, or for subscales of the SF-36. Further, no difference between the two groups was noted in patient satisfaction.

**Conclusion:** This randomized, controlled trial of patients with plantar fasciitis found that total contact insoles reduced pain while walking, as compared to flat insoles, but did not result in a greater improvement in patient satisfaction.

Oliveira, H. Effectiveness of Total Contact Insoles in Patients with Plantar Fasciitis. **J Rheum**. 2015, May; 42(5): 870-878.

## PAROXETINE, MITOCHONDRIAL PROTEINS, AND NEURAL PROTECTION

Even with the advent and implementation of combination anti-retrovirals therapy, the occurrence of HIV-associated neurocognitive disorders (HANDs) persists. These complications result from immune activation, oxidative stress and neurotoxicity resulting from persistent HIV replication or the release of viral products directly toxic to neurons. This study was designed to determine the neuroprotective mechanisms of paroxetine.

The authors initially screened more than 2000 compounds for protective efficacy against oxidative stress mediated neuronal injury. This screen identified selective serotonin reuptake inhibitors as having such a capacity. Rat hippocampal neurons were exposed to the mitochondria toxin, 3-NP, which resulted in death of approximately 20% of the cells. Rat neurons were then treated with paroxetine, or fluoxetine, at various doses, one hour prior to mitochondria toxin exposure. This treatment was follow by *in vivo* studies of similar exposures.

Paroxetine at doses of five and 10 microM provided almost complete protection against neuronal death, while fluoxetine reduced cell death by 500%. In the *in vivo* study, rats were randomized to receive paroxetine or saline one week after exposure to a mitochondrial neurotoxin, with a striking reduction in cell death in the paroxetine group. Paroxetine also increased the proliferation of neural progenitor cells, and induced anti-inflammatory effects, including a reduction in calcium dependent swelling of mitochondria.

**Conclusion:** This animal study provides evidence that paroxetine and fluoxetine can reduce neuronal cell death after exposure to a mitochondrial neurotoxin, reduce swelling of the mitochondria, and induce the proliferation of neural progenitor cells.

Steiner, J et al. Interaction of Paroxetine with Mitochondrial Proteins Mediates Neuroprotection. **Neurotherap.** 2015, Jan; 12(1): 200-216.

## CONCUSSION AND BATTING PERFORMANCE

After concussion, cognition is often impaired for weeks to months. Patients often complain of slowed thinking or response speed, mental fogginess, and poor concentration. As concussions account for over two percent of all time loss injuries in major league baseball, this study examined the relationship between concussion and batting performance.

This retrospective cohort study identified major league baseball players who sustained a concussion, examining batting metrics before and after the injury. This change in batting metrics was then compared to players who missed playing time by going on maternity or bereavement leave. Data were included for all events among players who had played in the major league regular season for at least two weeks before the event. The outcome data chosen were batting average (AVG) , on-base percentage (OBP), slugging percentage (SLG) calculated as [singles + (2 × doubles) + (3 × triples) + (4 × home runs)]/official at-bats), OBP plus slugging percentage (OPS), walk percentage (walks per plate appearances), strikeout percentage (strikeouts per at-bats), and home run percentage (home runs per at-bats).

Data were retrieved concerning 187 events of concussion, bereavement and paternity leave. Among players with concussion, batting performance declined during the two weeks after return from leave, while those in the other groups were found to have improvement in nearly all metrics. This difference was significant for AVG (p=0.005), OBP (p=0.01), SLG (p=0.004) and OPS (p=0.003). However, the differences between groups were not apparent beyond two weeks after return.

**Conclusion:** This study of major league baseball players with time lost due to concussion found that concussed players perform worse in the two weeks following return from a concussion injury.

Wasserman, E et al. Concussions Are Associated With Decreased Batting Performance Among Major-League Baseball Players. **Am J Sports Med.** 2015, May: 43(5):1127 – 1133.

## EARLY PHYSIATRIC INTERVENTION AND FUNCTIONAL IMPROVEMENT AFTER ISCHEMIC STROKE

Guidelines for acute ischemic stroke published by the American Heart Association, as well as the American Stroke Association, highlight the importance of early stroke rehabilitation. However, data are lacking concerning the impact of board-certified physiatrists (BCP) in early stroke management. This retrospective, Japanese study evaluated the impact of BCPs on the functional recovery of patients hospitalized with stroke.

The Japan Rehabilitation Database contains clinical data concerning patients discharged from participating hospitals between January of 2005 and December of 2013. Data retrieved included demographic, medical and functional outcomes. Among the acute hospitals participating in the database, 19 acute hospitals were chosen, which employed both BCP and non-BCP physicians for the clinical management of acute stroke patients. Outcome measures included Functional Independence Measure (FIM) effectiveness and discharge

destination. FIM effectiveness was calculated as discharge minus admission FIM scores divided by maximum FIM minus admission FIM scores. Patient outcomes were compared between those who were and those who were not cared for by a BCP.

Data were retrieved concerning 3,838 patients admitted within three days of stroke onset. Of those, a BCP provided early care for 21.2%. A multiviarate linear regression analysis found the involvement of a BCP to be a significant factor in FIM effectiveness ($p=0.003$), motor FIM effectiveness ($p=0.02$), as well as an increased rate of discharge to the patient's home ($p<0.05$).

**Conclusion:** This non-randomized, Japanese study found that the involvement of board-certified physiatrists in the early management of post-stroke patients to be a significant predictor of better functional recovery and increased discharge to home.

Kinoshita, S., et al. Clinical Management Provided by Board-Certified Physiatrists in Early Rehabilitation Is a Significant Determinant of Functional Improvement in Acute Stroke Patients: A Retrospective Analysis of Japanese Rehabilitation Database. **J Stroke Cerebrovascular Dis.** 2015, May; 24(5): 10191024.

## EPIDURAL STEROIDS VERSUS ORAL GABAPENTIN FOR RADICULAR PAIN

Low back pain (LBP) has been a leading cause of years lost to disability over the past several decades. Treatments for LBP have included epidural steroids, as well as oral medications, including gabapentin. This study compared the efficacy of a single epidural steroid injection versus oral gabapentin for patients with lumbosacral radicular pain.

Subjects were patients at least 17 years of age each diagnosed with radicular leg pain due to a herniated disc or spinal stenosis. The participants received epidural steroid injections plus placebo pills, or sham injections plus gabapentin, titrated to 1800 to 3600 mg per day. The primary outcome measure involved rating of the intensity of leg pain at one and three months after the intervention. The secondary outcome measures included worst leg pain, and average and worst back pain scored using the Oswestry Disability Index.

Of the 145 patients, 73 were included in the injection group and 72 in the gabapentin group. At one month, both groups experienced similar reductions in average leg pain scores from baseline with no significant difference between the groups. At three months, improvements in average leg pain persisted with no significant difference between the groups. For secondary outcome measures small differences were seen between the groups, favoring injections for worst leg pain scores and successful outcomes ($p=0.04$ and $p=0.02$, respectively).

**Conclusion:** This randomized controlled trial of patients with lumbosacral radicular pain due to herniated disc or spinal stenosis found that oral gabapentin and epidural steroid injections have similar effects on pain intensity at one and three months, although steroids may have a slight advantage in reducing worst leg pain at one month.

Cohen, S. Epidural Steroid Injections Compared with Gabapentin for Lumbosacral Radicular Pain: A Multicenter Randomized Double-Blind Comparative Efficacy Study. **Br Med J** 2015, April 16; 350: h1748.

## PHYSICAL ACTIVITY IN YOUTH DANCE CLASSES

Activity recommendations for children include 60 minutes of moderate to vigorous physical activity on most days. Data suggest that only 42% of children and eight percent of adolescents meet this guideline. As dance is particularly popular among girls, this study assessed the physical activity involved in seven types of studio dance classes.

Dance studios in San Diego, California, were identified, with 17 randomly selected for inclusion. The dance studios offered classes in ballet, jazz, hip-hop, Latin flamenco, Latin salsa, ballet folklorico and partnered dance. Students, five to 18 years of age, and instructors, were given accelerometers for the length of class and asked to complete a brief survey. Only beginner and intermediate level classes were eligible for inclusion. Data were reviewed for total activity, as well as time spent in sedentary, light, moderate, vigorous and moderate plus vigorous activity (MPVA).

A total of 264 girls participated in the study, including 110 adolescents. For children, minutes of MVPA per hour session were 26.9 for hip-hop, 22.3 for partnered dancing, 22.1 for jazz dancing, 19.2 for tap dancing, 18.1 for Latin-salsa, 13.9 for ballet, and 6.4 for Latin-flamenco. For adolescents, the time spent in MVPA per hour class was 15.6 minutes for hip-hop, 13.9 minutes for jazz, 12.74 for tap, 11.2 for Latin-salsa, 16.6 for ballet, 9.34 for partnered dance, and 4.04 for Latin-flamenco.

**Conclusion:** This study of dance classes for children and adolescents demonstrates that hip-hop provides the greatest amount of moderate to vigorous physical activity, both for children and adolescents, while Latin flamenco provides the least.

Cain, K., et al. Physical Activity in Youth Dance Classes. **Pediatrics.** doi: 10.1542/peds.2014-2415

## PREDICTOR OF PHYSICAL HEALTH ONE TO FIVE YEARS AFTER TRAUMATIC BRAIN INJURY

Traumatic brain injury (TBI) often causes long-term physical, cognitive, behavioral and emotional impairments. Due to the paucity of research examining the longitudinal trajectories of health-related quality of life after TBI, this study was designed to determine whether the trajectory of recovery of physical health over five years can be predicted by demographic and injury related variables.

This longitudinal, cohort study included subjects with moderate to severe TBI, recruited between 2005 and 2007 at a Norwegian referral center. All subjects were assessed at follow-ups of one, two and five years post-injury, using the four subscales of the 36-item short-form health survey. Predictor variables collected included gender, age, relationship status, guardianship of dependent children, education level, employment status, occupation, acute Glasgow scale score, cause of injury, length of posttraumatic amnesia and results of CT of the head.

Of the original subjects, 97 had at least one follow-up visit. Of the four subscales evaluated, only physical functioning yielded significant

*(Continued from page 2)*

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improvement over all time points (p=0.006). Participants with higher level education (p=0.014), employed at the time of injury (p=0.029) and with shorter posttraumatic amnesia (p<0.001) had higher scores on physical functioning over time. The other three subscales remained stable over time. Participants who were employed at the time of injury had a much higher general health over time than those who were not (p<0.001).

**Conclusion:** This study of patients with moderate to severe traumatic brain injury found that physical function scores improved significantly at one, two and five years post-injury.

Andelic, N., et al. Trajectories of Physical Health the First Five Years after Traumatic Brain Injury. **J Neurol.** 2015, March; 262(3): 523-530.

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