

REHAB IN REVIEW

TM

WWW.REHABINREVIEW.COM

Volume 23 Number 9

Published by Physicians
In Physical Medicine and Rehabilitation

September 5, 2015

STELLATE GANGLION BLOCK FOR POSTTRAUMATIC STRESS DISORDER

Posttraumatic stress disorder (PTSD) is a chronic anxiety disorder caused by seeing or experiencing traumatic events. As the sympathetic nervous system seems to play a dominant role in the development and maintenance of PTSD, this study reviewed the evidence of the efficacy of a stellate ganglion block (SGB) for the treatment of this disorder.

In a review of cases of PTSD treated with SGB, one researcher found clinically meaningful improvements in 75% of the patients after the block. Another paper found 166 military service members with PTSD treated with SGB to have clinically significant reductions in scores on the PTSD checklist, with improvement sustained three to six months after the procedure. While there were no randomized, controlled trials comparing SGB to placebo, this group of studies suggests that the success rate exceeds 70%. The authors recommend further inquiry.

Conclusion: This review of patients with posttraumatic stress disorder treated with cervical sympathetic blocks found a number of studies which suggest a significant reduction in symptoms, with some indicating a sustained reduction over months after treatment.

Lipov, E., et al. A Review of the Use of Stellate Ganglion Block in the Treatment of Posttraumatic Stress Disorder. *Current Psychiatry Rep.* 2015, August; 17(8): 63.

TOPICAL DICLOFENAC FOR NEUROPATHIC PAIN

Neuropathic pain results from injury to the peripheral and/or central nervous system, and is often difficult to treat. This study was designed to determine the effect of the topical

nonsteroidal anti-inflammatory drug, diclofenac, as a treatment for patients with neuropathic pain.

This double-blind, placebo-controlled, crossover trial included patients with a diagnosis of post-herpetic neuralgia or chronic regional pain syndrome. The participants were assessed at baseline with a quantitative sensory test, and were then randomized to a placebo or a treatment group. Subjects topically applied 1.5% topical diclofenac or a placebo solution three times per day to the painful area for two weeks. After a one-week washout period, the participants received the alternative cream. At baseline and follow-up, the subjects were asked to complete the Pain Questionnaire and Short Form Health Survey (SF-36) and to undergo quantitative sensory testing.

After two weeks of topical application, the subjects in the treatment group obtained lower VAS pain scores than did the placebo group (4.9 versus 5.6, respectively; $p=0.04$). In addition, at two weeks, the VAS scores for burning pain were lower in the treatment group than in the control group (2.9 versus 4.3, respectively; $p=0.02$). No significant differences occurred between groups in constant pain, hypersensitivity or shooting pain.

Conclusion: This prospective, double-blind study of patients diagnosed with postherpetic neuralgia or complex regional pain syndrome found that topical diclofenac may be an effective treatment option.

Ahmed, S., et al. Effect of 1.5% Topical Diclofenac on Clinical Neuropathic Pain. *Anesthesiology.* 2015, July; 123(1): 191-198.

MENISCAL TRANSPLANTATION

Meniscal transplantation has been performed for many years, with few long-term studies published to date. This study was designed to better

understand the survivorship rates and long-term functional outcomes of patients undergoing meniscal transplantation.

Thirty-eight patients with articular cartilage deterioration underwent meniscal transplants of 40 cryopreserved menisci. In a previous evaluation at a mean of 3.3 years, the characteristics of the transplants had been assessed by MRI. At that time, the transplants had been rated as normal in 43%, as altered in 30% and as failed in 28%. Those who did not undergo a follow-up surgery were followed for a mean of 11 years.

The mean age at surgery was 30 years. Of the original 40 patients, eleven required follow-up surgery in the initial study at 0.2 to 1.5 years, and 11 other transplants required surgery at 6.1 to 14.5 years. Therefore, of the initial 40 transplants, 18 completed the long-term evaluation at a mean of 13.7 years. At follow-up, the patients were evaluated clinically and radiographically.

At baseline, 72% of the patients had moderate or severe pain with daily activities, while, at follow-up, 11% had such pain ($p<0.0001$). At baseline only one of the 18 patients participated in sports, while at follow-up, 14 of 18 were participating. A survivorship analysis revealed that the probability of transplant survival was 88% at five years, 63% at ten years, and 40% at fifteen years. The mean time at failure was 8.2 years for medial transplants and 7.6 years for lateral transplants.

Conclusion: This long-term follow-up of 40, consecutive medial and lateral meniscal transplants found that 22 required repeat surgery and that, among the others, symptoms improved, and return to sport activities occurred in the majority of patients.

Noyes, F., et al. Meniscal Transplantation in Symptomatic Patients under Fifty Years of Age. *J*

Editor-in-Chief

David T. Burke, M.D., M.A.
Emory University, Atlanta, GA

Executive Editor

Randolph L. Roig, M.D.
Emory University, Atlanta, GA

Copy Editor

Roberta Alysoun Bell, Ph.D.
Emory University, Atlanta, GA

Contributing Editors

*Saiyun Hou, M.D., PhD
Baylor Coll. of Medicine, Houston, TX

*Emily Boyd, M.B.B.S.
*Ogoegbunam Agubuzu, M.D.
Maria Beran, M.D.
David Bradberry, D.O.
Michael Bush-Arnold, M.D.
Zachary Chaz Fausel, M.D.
Casey Leong, M.D.
Anna McCrate, M.D.
Kunj G. Patel, M.D.
Emory University, Atlanta, GA

*Casey Murphy, M.D.
Eric Sterne, M.D.
LSU, New Orleans, LA

*Bryndon Hatch, M.D.
*Katie Nanos, M.D.
Mayo Clinic, Rochester, MN

*Ashley Zakhary, M.D.
Archana Bhatt, D.O.
Yousaf Chowdhry, M.D.
Bo Cui, M.D.
Stella Ferker, M.D.
Trishla Kanthala, D.O.
Anup Patel, D.O.
Nassau U. Med Cen., E. Meadow, NY

*Christina Marciniak, M.D.
Mary Caldwell, D.O.
Jeff Cara, D.O.
Megan Flanigan, M.D.
Benjamin A. Ingraham, D.O.
Xin Li, D.O.
Pegah Safaeian, D.O.
N.W.U./R.I.C., Chicago, IL

*Idris Amin, M.D.
Dimir Abrar, M.D.
Kevin Franzese, D.O.
Joseph P. Riley, M.D.
Jill Scolnick, D.O.
NYU/Rusk Inst. of Rehab Med, NY, NY

*Ondrea McKay, M.D.
Dana Branch, MSIV
Mihir Joshi, MSIV
Royce Shou, MSIV
Paul So, MSIV
Rutgers-NJMS/Kessler, Newark, NJ

*Zainab A. Naji, M.D.
Michael Koniuch, M.D.
Sarah Yang, M.D.
Schwab Rehab/U. of Chicago Hosp., IL

*Arpit Arora, M.D.
Rodion Erenberg, M.D.
Jameel Khan, M.D.
SUNY Downstate M. C., Brooklyn, NY

*Andreea Nitu-Marquise, M.D.
SUNY Upstate Med. Univ., Syracuse, NY

*Ilya Igochnikov, M.D., M.S.
Michael Hodde, D.O., ATC

Bone Joint Surg. 2015, August 5; 97
(15): 1209-1219.

CONSTRAINT INDUCED MOVEMENT THERAPY IN EARLY STROKE REHABILITATION

Constraint induced movement therapy (CIMT) was originally developed for patients with chronic stroke, and included 10 days of therapy for six hours per day. This study assessed the effect of a modified CIMT protocol conducted in the early phase of rehabilitation after stroke.

This single-blinded, multi-center, randomized, controlled trial included patients with a first-ever or recurrent stroke at more than five, and less than 26 days prior to recruitment. Subjects randomized to a CIMT group received treatment for 10 consecutive workdays for three hours per day. The patients were encouraged to wear a constraining mitt on the unaffected hand for up to 90% of waking hours. The control group was treated according to the Norwegian guidelines for stroke patients. The primary outcome measure was the Wolf Motor Function test (WMFT), with secondary outcome measures including the Fugl-Meyer upper extremity motor assessment, the Nine-Hole Peg test (NHPT), the arm use ratio and the Stroke Impact Scale.

Of the 22 CIMT participants available for post-treatment assessment, 19 completed all 10 treatment days, with a mean time in treatment of 27 hours. After treatment, WMFT functional ability scores were significantly better in the treatment group ($p=0.01$). In addition, dexterity, as measured by the NHPT, was significantly better in the treatment group than in the control group. However, at six months, those differences had disappeared.

Conclusion: This study of patients with ischemic stroke found that constraint induced movement therapy may accelerate short-term recovery, with no evidence of long-term benefit over conventional treatment.

Thrane, G., et al. Efficacy of Constraint-Induced Movement Therapy in Early Stroke Rehabilitation: A Randomized, Controlled Multisite Trial. **Neurorehab**

and Neural Repair. 2015, July; 29
(6): 517-525.

NEUROLINGUISTIC PROGRAMMING FOR ISCHEMIC STROKE

In China, the treatment of stroke is primarily through medication, rehabilitation training and acupuncture. Previous studies have demonstrated that a significant number of stroke patients have symptoms of depression and anxiety that may linger for years. Recent Cochrane reviews have found no evidence for the benefit of psychotherapy to treat these conditions. This study evaluated the effect of a brief psychotherapy, Neurolinguistic Programming (NLP), as an intervention for emotional distress following stroke.

This study was conducted at a stroke unit in Wuhan, China and involved 180 patients hospitalized with ischemic stroke between October of 2011 and May of 2012. The patients were randomized to receive either four sessions of NLP intervention and health education, or usual care. The primary outcome measure was the prevalence of depression and anxiety, as assessed with the Hamilton-17 Depression Scale (HAM-D₁₇) and the Hamilton Anxiety Scale (HAM-A). Secondary outcome variables included quality-of-life and physical function.

At study onset, 58.3% of the patients had depressive symptoms and 55.6% had symptoms of anxiety, with no difference between the groups at baseline. After intervention, 82.2% of the treatment group and 62.2% of the control group experienced a remission of depressive symptoms ($p=0.003$), while 76.6% of the treatment group and 60% of the control group experienced a remission of anxiety ($p=0.016$). At six-month follow-up, no significant difference was seen between the groups in the prevalence of depression or anxiety. The median quality-of-life scores in the intervention group were higher than those in the control, both after intervention and at six-month follow-up ($p=0.01$ and $p<0.01$, respectively). In addition, the NLP group demonstrated better physical function than did the controls, both after intervention and at six-month follow-

up ($p=0.01$ and $p=0.023$, respectively).

Conclusion: This study of patients with acute ischemic stroke and symptoms of anxiety or depression found that four sessions of neurolinguistic programming reduced depression and anxiety better than usual care during hospitalization, with no significant differences between groups at six months.

Peng, Y., et al. Effect of a Brief Intervention for Patients with Ischemic Stroke: A Randomized, Controlled Trial. *J Stroke Cerebrovasc Dis.* 2015, August; 24 (8): 1793-1802.

GRANULOCYTE COLONY STIMULATING FACTOR FOR TREATING STROKE

Ischemic stroke kills 2.9 people annually and leads to 3.4 million people living with disability worldwide. The only FDA approved thrombolytic agent currently available for acute ischemic stroke is tissue plasminogen activator. Granulocyte colony-stimulating factor (G-CSF) acts on hematopoietic stem cells to modulate neutrophil precursor proliferation and differentiation. As animal studies have suggested beneficial effects of G-CSF for acute stroke, this meta-analysis was designed to clarify the role of G-CSF in patients with stroke.

This meta-analysis included studies of humans treated with G-CSF for acute ischemic stroke, with outcome measures including the National Institutes of Health Stroke Scale (NIHSS), the modified Rankin scale (mRC) and the Barthel index (BI). Databases reviewed included PubMed, EMBASE, Web of Science, Cochrane Library and the Chinese Biomedical Literature Database. Of the 609 articles filtered, 10 randomized, controlled trials, involving 711 individuals, were included in the final analysis. These included 356 treated with G-CSF and 355 treated with placebo.

Patients treated with G-CSF obtained significantly better NIHSS ($p=0.04$) and mRC scores ($p=0.01$) than did those receiving placebo. No significant difference was noted in BI scores. In addition, stronger CD34 counts and improved leukocyte levels were seen in the treatment groups as compared to the control groups.

Conclusion: This meta-analysis of randomized, controlled trials involving patients with ischemic stroke found that granulocyte colony stimulating factor is effective in mobilizing bone marrow derived CD 34 stem cells and improving National Institute of Health Stroke Scale and Modified Rankin Scale scores.

Fan, Z., et al. Efficacy and Safety of Granulocyte Colony-Stimulating Factor for Patients with Stroke. *J Stroke Cerebrovasc Dis.* 2015, August; 24(8): 1701-1708.

MODAFINIL FOR COGNITIVE NEUROENHANCEMENT

Most contemporary strategies for neuroenhancement, including invasive and noninvasive brain stimulation and pharmacological manipulation, remain in their infancy. Modafinil has been evaluated for cognitive modulation in healthy humans, and appears safe for widespread use, although its efficacy for neuroenhancement is not yet clear. This systematic review was designed to better understand the efficacy of modafinil as a medication for neuroenhancement.

The authors completed a review of the literature, including prospective studies on healthy humans who were not sleep deprived, with each study including at least one cognitive test. Data were summarized concerning attention, executive function, inhibitory control, working memory, cognitive flexibility, learning and memory, planning, decision-making, fluid intelligence, assistance with complex tasks and alteration of mood.

The literature review suggested that, when simple psychometric tests were considered, modafinil was found to enhance executive function, with some variable benefits for attention, learning and memory. In studies of more complex tasks, modafinil was found to enhance attention, higher executive functions, as well as learning and memory. Of the studies that reported on side effects, 78% reported no side effects with the remaining studies reporting that a small minority of participants experienced insomnia, headache, stomachache or nausea and dry mouth.

Conclusion: This literature review of the effects of modafinil on

non-sleep deprived, healthy patients found that this medication provides some benefit to cognition, in particular to executive functions.

Battleday, R., et al. Modafinil for Cognitive Neuroenhancement in Healthy, Non-Sleep Deprived Subjects: A Systematic Review. *Euro Neuropsychopharm.* 2015. <http://dx.doi.org.proxy.library.emory.edu/10.1016/j.euroneuro.2015.07.028>

AUTOLOGOUS BLOOD INJECTIONS FOR PLANTAR FASCIITIS

Plantar fasciitis is a common condition, typically affecting people in the fourth and fifth decades of life. A wide variety of conservative therapies have been used to treat this condition, including rest, stretching, splinting, taping and orthotics. Although corticosteroid injections have been used with some success, plantar fascia rupture has been reported in up to 10% of cases. This study explored the efficacy of autologous blood injections for the management of chronic plantar fasciitis.

This prospective study included 62 patients with plantar fasciitis, with an average duration of symptoms of 50 months. All subjects received three to four mL of autologous whole blood, injected into the plantar fascia with the use of ultrasound guidance. The patients were then given a standardized home exercise program. All were followed up at two to three weeks and six weeks post-procedure, and then at three and six months. Outcome measures included visual analogue scale (VAS) pain scores, satisfaction scores and a patient rated outcome measure, the Revised Foot Function Index questionnaire.

At a median duration of 631 days, 55% of the patients were pain free, 68% were virtually pain free (with a VAS score of zero or one), with 4.9% reporting insufficient recovery, proceeding to surgery. The mean VAS pain score at baseline was 8.1, falling to 1.3 at follow-up. At follow-up, 62% of the patients reported being very satisfied with the procedure, with 74% reporting that they would definitely recommend the procedure.

Conclusion: This case series of patients with chronic plantar fasciitis suggests that autologous blood

injections may be effective in reducing pain.

Wheeler, P., et al. The Role of Autologous Blood Injections in the Treatment for Patients with Chronic Plantar Fasciitis - A Case Series and Longer-Term Follow-Up. **Intern Musculoskel Med.** 2015, July; 37(2): 47-53.

TESTOSTERONE ADMINISTRATION AND SUBCLINICAL ATHEROSCLEROSIS IN OLDER MEN

Testosterone sales have increased significantly over the past decade, especially to older men. Some studies have raised concern that testosterone supplementation might increase the risk of cardiovascular disease events. This study was designed to determine the effect of increasing circulating testosterone concentrations to a mid-normal range for young men with low or low-normal testosterone levels on subclinical atherosclerosis.

The Testosterone's Effects on Atherosclerosis Progression in Aging Men (TEAAM) trial was a randomized, double-blind, placebo-controlled, trial involving community dwelling men, 60 years or older with low or low-normal testosterone levels. Eligible participants were randomized to daily receive either a placebo gel or testosterone gel, with the latter adjusted such that the total testosterone concentrations were between 500 ng/dL and 900 ng/dL. Distal common carotid intima media thickness was measured at baseline and every six months during the intervention period. The total coronary artery calcium score was determined using multidetector-row computed tomography (MDCT) at baseline and at 18 and 36 months. The participants were also assessed for sexual function and health-related quality-of-life.

Subjects were 306 men with a mean age of 67.6 years and a body mass index of 28.1. The per year rate of change in intima-media thickness and the change in coronary artery calcium did not differ significantly between groups ($p=0.30$ and $p=0.48$, respectively). Intercourse satisfaction scores improved significantly more in the treatment group, although the differences were thought to be

modest ($p=0.05$). Self-reported physical function, composite health-related quality-of-life and adverse events did not differ significantly between the two groups.

Conclusion: This study of older men with low or low normal testosterone levels found that three years of testosterone supplementation did not affect the change in common carotid artery intima media thickness or coronary artery calcium, nor did it improve overall sexual function or health-related quality-of-life.

Basaria, S., et al. Effects of Testosterone Administration for Three Years on Subclinical Atherosclerosis Progression in Older Men with Low or Low Normal Testosterone Levels. **JAMA.** 2015, August 11; 314(6): 570-581.

BALANCE PROGRAM FOR FALL PREVENTION FOR OLDER WOMEN

While previous studies have demonstrated that balance training may be effective in reducing falls in older, community dwelling individuals, most trials have lacked the power to show the effect of this training on injurious falls. This study was designed to better understand the effect of balance training on the rate of injuries resulting from falls in the elderly.

This multicenter, randomized, controlled trial included 20 sites across France, from December of 2007 to June of 2013. Women ages 35 to 85 years of age, living in the community were examined. Those deemed to be at high risk of falling were included. Of those included, 352 patients in the treatment group underwent one-hour weekly sessions for two years, focusing upon improving postural stability, balance and coordination. Subjects in the control group were given brochures concerning fall prevention. The primary outcome measure was the number of serious injuries (resulting in fractures) and moderate injuries (bruising resulting in a functional decline of at least three days' duration or requiring medical attention) resulting from falls.

During the study period, 397 falls with injury occurred among the 189 women in the control group, and 305 among the 170 women in the

intervention group. Over the two-year intervention period, the fall injury rate was 19% lower in the intervention group than in the control group ($p=0.004$). The rates of moderately serious falls decreased by similar magnitudes.

Conclusion: This study of elderly women at risk for falls found that once per week progressive balance training can reduce the risk of injurious falls by 19%.

El-Khoury, F., et al. Effectiveness of Two-Year Balance Training Program on Prevention of Fall Induced Injuries in at Risk Women Aged 75 to 85 Living in Community: Ossebo Randomized, Controlled Trial. **Br Med J.** 2015; 351: H3830.

HAND EXERCISES FOR OSTEOARTHRITIS

Hand osteoarthritis (HOA) is highly prevalent, and poses functional burdens on those affected. Evidence of the effectiveness of non-pharmacologic therapies such as range of motion and strengthening exercises is controversial, and lack randomized, controlled studies. This study further examined the effect of hand exercises on women with HOA.

This prospective study included 80 women with HOA between the ages of 18 and 80 years of age. The patients were randomized to receive either information regarding HOA and an exercise program or information alone. The exercise program involved a rubber ball to provide resistance in the grip while rubber bands were used to provide resistance to the thumb abduction/extension. The patients were assessed at baseline and at three months with activity measured by the Patient-Specific Functional Scale (PSFS). Data regarding grip strength and webspace were also collected at baseline and at study completion.

A significant difference was found between groups in the PSFS scores, favoring the exercise group ($p<0.001$). Better improvements were also noted in the treatment group as compared to the control group in joint pain ($p=0.02$), grip strength ($p<0.001$), thumb webspace ($p=0.018$ (right) and $p=0.007$ (left)) and hand fatigue ($p=0.05$).

Conclusion: This randomized, controlled trial demonstrated that home-based hand exercises are

effective in improving activity performance and pain in patients with hand osteoarthritis.

Hennig, T., et al. Effect of Home-Based Hand Exercises in Women with Hand Osteoarthritis: A Randomized, Controlled Study. **Ann Rheum Dis**. 2015, Aug; 74(8): 1501-1508.

MINDFULNESS-BASED STRESS REDUCTION FOR POSTTRAUMATIC STRESS DISORDER

Posttraumatic stress disorder (PTSD) is believed to affect 23% of veterans returning from deployments in Afghanistan and Iraq. As treatment options, the U.S. Department of Veterans Affairs (VA) relies heavily upon prolonged exposure therapy and cognitive processing therapy. However, studies have shown that 30 -50% of veterans participating in prolonged exposure or cognitive processing therapy fail to show clinically significant improvement. This randomized clinical trial compared mindfulness-based stress reduction with active, present-centered group therapy.

Studies included armed forces veterans with a diagnosis of PTSD. The mindfulness group was involved in an initial orientation group, followed by seven, weekly 2.5-hour group sessions and a 6.5 hour retreat, for a total of nine sessions. Those in present-centered group therapy underwent nine, weekly, 1.5-hour group sessions, focusing on current life problems as manifestations of PTSD, with session 9 focused on reviewing accomplishments and planning for the future. The primary outcome measure was change in PTSD symptom severity over time, as measured by the PTSD checklist.

Of the 116 patients, 58 were assigned to mindfulness-based stress reduction and 58 to present-centered group therapy. The mean PCL scores improved from baseline to two months' follow-up in both groups, although the improvement in the mindfulness-based stress reduction was significantly greater than that in the present-centered group ($p<0.001$). However, there was no significant difference between the groups in loss of the PTSD diagnosis at post-treatment follow-up (42.3% versus 43.9%).

Conclusion: This study of war veterans with PTSD found that mindfulness-based stress reduction can be effective for the reduction of symptoms.

Polusny, M., et al. Mindfulness-Based Stress Reduction for Posttraumatic Stress Disorder among Veterans: A Randomized, Clinical Trial. **JAMA**. 2015, August 4; 314(5): 456-465.

EFFECTS OF ATTENTION DEFICIT HYPERACTIVITY DISORDER ON CONCUSSION RECOVERY

Sports related concussions in the United States occur at an estimated frequency of 1.6 to 3.8 million per year, with an increased risk among youth athletes. While attention deficit hyperactivity disorder (ADHD) is considered to be a modifying factor in concussion management, few have reported on the effects of ADHD on concussion recovery in youth athletes. This study was designed to determine whether ADHD affects post-concussion recovery.

This retrospective, case control study reviewed the baseline and post-concussion ImPACT scores of youth athletes who had sustained sports related concussions between July of 2008 and June of 2013. Student-athletes with self-reported diagnoses of ADHD were identified, with scores compared with an age-matched control group drawn from that database.

Seventy youth with ADHD and 70 controls were identified for inclusion. Of those, 62.3% with ADHD and 76.6% without ADHD had sustained no prior concussions. At baseline, athletes with ADHD had poorer ImPACT scores on the various neurocognitive test modules as compared with the control group. However, the only significant difference was seen in the verbal memory composite scores ($p=0.01$). Further, no significant difference in recovery time was noted between the two groups.

Conclusion: This retrospective study of youth athletes with concussion found that those with ADHD have lower verbal memory scores on baseline ImPACT testing, although no differences were found in post-concussive recovery time between those with and those without ADHD.

Mautner, K., et al. Effects of Attention Deficit Hyperactivity Disorder and Postconcussion Recovery in Youth Athletes. **Clin J Sports Med**. 2015, July; 25(4): 355-360.

INTRACRANIAL HEMORRHAGE RISK WITH ANTIDEPRESSANTS AND NSAIDS

Both antidepressants and nonsteroidal anti-inflammatory drugs (NSAIDs) are thought to increase the risk of abnormal bleeding. As studies have shown that the odds of upper gastrointestinal bleed significantly increase when SSRIs and NSAIDs are used together, this study was designed to estimate the risk of intracranial hemorrhage among patients treated with both antidepressants and NSAIDs.

This retrospective study utilized data from the Korean Health Insurance Review and Assessment Service database. That database includes 4,145,226 patients prescribed NSAIDs within 30 days after starting an antidepressant. The primary outcome measure was the time to first hospital admission with an intracranial hemorrhage.

After adjusting for comorbidities, the risk of intracranial hemorrhage was found to be higher among those with concurrent use of antidepressants and NSAIDs than for those treated with antidepressants alone (hazard ratio 1.6). A subgroup analysis found a higher risk of ICH in men than in women (hazard ratios of 2.6 and 1.2, respectively). No difference in risk was found between the classes of antidepressants.

Conclusion: This retrospective study of patients receiving antidepressants found that the addition of an NSAID increases the risk of intracranial hemorrhage.

Shin, J., et al. Risk of Intracranial Hemorrhage in Antidepressant Users with Concurrent Use of Nonsteroidal Anti-Inflammatory Drugs: A Nationwide, Propensity, Score Matched Study. **BMJ**. 2015, July; 351: H3517.

FAMILIAR AUDITORY SENSORY TRAINING FOR ACUTE TRAUMATIC BRAIN INJURY

For patients in states of disordered consciousness (DOC)

after traumatic brain injury (TBI), rehabilitation commonly includes sensory stimulation. This study was designed to determine whether familiar auditory sensory training (FAST) is beneficial for patients with severe TBI.

Persons with disorders of consciousness were randomized to either a FAST group or a "placebo silence" group. The FAST protocol listened to customized stories told by people well known to the patient. Those stories represented specific events experienced by both the patient and the storyteller. The placebo protocol was silence.

All patients received the auditory protocols for 10 minutes, four times per day, with at least two hours between sessions, for six weeks. Outcome measures included the Disorders of Consciousness Scale (DOCS) and the Coma - Near Coma (CNC) Scale. In addition, functional magnetic resonance imaging (fMRI) was used to examine the effect of the FAST protocol on neuroactivation.

The FAST group had significantly greater average change in CNC measures than did the control group ($p=0.049$), though the average change in DOCS scores did not differ significantly between the groups ($p=0.465$). The fMRI analysis revealed that the FAST patients had more fMRI activation than did the placebo group in language regions and whole brain ($p<0.05$), resembling the activation of healthy controls.

Conclusion: This study of patients with disorders of consciousness after traumatic brain injury found that improved arousal and awareness may occur with the use of familiar auditory sensory training.

Pape, T., et al. Placebo-Controlled Trial of Familiar Auditory Sensory Training for Acute, Severe Traumatic Brain Injury: A Preliminary Study. *Neurorehab Neural Repair*. 2015, July; 29(6): 537-547.

OBESITY AND TOTAL ANKLE REPLACEMENT

Obesity has been found to be associated with higher rates of revision and infection among patients undergoing total hip and total knee arthroplasty. This study assessed the effect of obesity on patients

undergoing total ankle replacement (TAR).

This retrospective cohort trial included patients undergoing TAR between May of 2002 and November of 2011. The cohort included 30 obese patients and 48 nonobese patients, followed for means of 3.76 years and 3.92 years, respectively. Outcome measures were the Ankle Osteoarthritis Scale (AOS) and the Short Form-36 (SF-36), administered preoperatively and again at least two years postoperatively.

At follow-up, both cohorts demonstrated significant improvements in AOS pain scores, with no significant difference in change between the groups. In addition, scores on the SF-36 improved in both groups, with no significant difference noted between groups. Similarly, the rates of complications and revisions between groups did not differ significantly. The mean operation-free survival times were 4.5 years for the obese group and 4.6 years for the non-obese group ($p = 0.47$).

Conclusion: This study of patients undergoing total ankle replacement found that the surgery improves disability and pain, with no difference in outcome between those with and those without obesity at the time of surgery.

Bouchard, M., et al. Impact of Obesity on the Outcome of Total Ankle Replacement. *J Bone Joint Surg*. 2015, June; 97(11): 904-910.

COMMUNITY EXERCISE AND METABOLIC, COGNITIVE FUNCTION FOLLOWING STROKE

Prospective studies have suggested that a physically active lifestyle may be neuroprotective, resulting in less age-related decline in cerebral blood flow, brain atrophy and cognitive function. This study explored the effects of structured community exercise on metabolic risk factors and brain, physical and cognitive function after stroke.

This single center, single-blind, parallel, randomized trial included adults over 50 years of age with a stroke at least six months prior to study onset. An exercise group participated in 19 weeks of 45 to 60 minute exercise sessions three times per week, with training at 40 to 50% of maximum heart rate, titrating to 70

to 80% as tolerated over four weeks. The control group completed a matched duration home stretching program. Outcome measures were assessed at baseline and within one week post-intervention, with these including glucose control MR imaging of gray matter atrophy, cerebral blood flow and regional metabolism, resting blood pressure, lipid profile, body composition, and physical and cognitive outcome.

Of the six individuals with impaired glucose tolerance at baseline, two improved to levels within normal limits. The medial temporal lobe cerebral blood flow increased significantly in the exercise group ($p<0.05$) but not in the control group. Significant between-group differences were seen in peak oxygen consumption ($p<0.02$) and peak work rate ($p<0.02$), favoring the exercise group. In addition, improvements were noted in the exercise group as compared with control group on the six-minute walk test, walking speed, the Berg balance scale, cognition, quality-of-life (measured with the Stroke Impact Scale Version 2.0), and mood.

Conclusion: This randomized, controlled pilot study demonstrated that a structured community delivered exercise therapy program after stroke can produce short-term improvements in metabolism, physical function, cognition and quality-of-life.

More, S., et al. Effects of Community Exercise Therapy on Metabolic, Brain, Physical and Cognitive Function following Stroke: A Randomized, Controlled Pilot Trial. *Neurorehab Neural Repair*. 2015, August; 29(7): 623-635.

SPICY FOODS AND CAUSE SPECIFIC MORTALITY

The beneficial effects of spices and their bioactive ingredients have long been studied. This trial prospectively examined the associations of regular consumption of spicy foods on cause specific mortality.

The China Kadoorie Bio Bank is a prospective cohort study of 512,891 adults, 30 to 79 years of age from ten, geographically diverse areas of China. Participants enrolled between 2004 and 2008 were assessed for spicy food consumption, rating

consumption as never or almost never, only occasionally, one to two days per week, three to five days per week or six to seven days per week. At baseline, all subjects underwent a physical examination, with a medical history taken. The subjects were followed, with status ascertained by linkage with local disease and death registries as well as residential records.

During a median follow-up of 7.2 years, an inverse association was found between spicy food consumption and total mortality. Compared to those who ate spicy foods less than once a week, those who consumed spicy food six or seven days a week had a 14% relative risk reduction in total mortality. Inverse associations were observed for death due to cancer, ischemic heart disease and respiratory diseases. A stronger inverse association was noted among participants who did not consume alcohol compared to those who did ($p=0.033$ for interaction).

Conclusion: This Chinese study found that increased consumption of spicy foods is related to a relative risk reduction in total mortality.

Lv, J., et al. Consumption of Spicy Foods and Total and Cause Specific Mortality: Population Based Cohort Study. *Br Med J*. 2015; 351: H3942.

VITAMIN D AND RISK OF STROKE

Low levels of vitamin D have been estimated to affect approximately 1,000,000,000 people worldwide, with evidence of associated risk of stroke. This study reviewed the associations and interactions between 25 (OH)D levels, race and vitamin D binding protein (DBP) single nucleotide polymorphisms (SNP) with incident stroke.

The Atherosclerosis Risk in Communities (ARIC) study is an ongoing, community-based, prospective cohort of 15,792 adults, ages 45 to 65 years at baseline. Serum 25 (OH)D levels were measured at baseline (1999-1992) while two single nucleotide polymorphisms located (rs 7041 and rs 4588) in the coding region of the DBP gene were genotyped. All stroke related hospitalizations in this occurring through December 2011 were identified.

During a median of 20 years' follow-up, there were 800 incident strokes. After adjusting for demographic factors, those in the lowest quintile of 25 (OH)D had a significantly greater risk of stroke than did those in the highest quintile (hazard ratio 1.49). Similar patterns were seen when subjects were stratified by race. The DBP polymorphism frequencies varied by 25 (OH)D levels and by race. Lower 25 (OH)D levels were associated with a slightly higher risk of stroke among those with rs7041 TG/GG versus TT genotypes and with rs4588 AC/AA versus CC genotypes.

Conclusion: This community-based sample showed that lower 25 (OH)D levels are associated with an increased incidence of stroke, with a statistically insignificantly increased risk among certain measured genotypes.

Schneider, A., et al. Vitamin D, Vitamin D Binding Protein Gene Polymorphisms, Race and Risk of Incident Stroke: The Atherosclerosis Risk in Communities (ARIC) Study. *Euro J Neurol*. 2015, August; 22(8): 1220-1227.

VIRTUAL REALITY TRAINING FOR PATIENTS WITH PARKINSON'S DISEASE

Parkinson's disease (PD) is a progressive neurodegenerative disease that may affect postural stability and gait. Over two thirds of community dwelling patients with PD experience falls every year, with tripping over obstacles the major cause of these falls. This study examined the effects of virtual reality-based exercise on obstacle crossing performance and dynamic balance in patients with PD.

Thirty-six patients with PD were randomly assigned to one of three groups. Interventions included traditional exercise (TE), virtual reality-based Wii fit exercise (VRWii), with treadmill training included in both. All subjects underwent 12 sessions over six weeks. Participants in the control group received only fall-prevention education. The primary outcome variables were obstacle crossing performance and dynamic balance, assessed by the Balance Master system. Secondary outcomes included the sensory organization test (SOT), the 39-question Parkinson's

Disease Questionnaire (PDQ39) and the Timed Up and Go Test. All outcomes were assessed at baseline and after training, at one-month follow-up.

At one-month follow-up, the VRWii group demonstrated greater improvement in obstacle crossing velocity ($p=0.003$) and crossing stride length ($p=0.001$) than did the control group, with no differences between the VRWii and the TE group. Both the VRWii and TE groups showed significantly greater improvements than the controls on the TUG, PDQ39 and FES-I, with no significant differences between the VRWii and TE groups.

Conclusion: This study demonstrated that virtual reality training through the use of Wii fit can improve obstacle crossing performance in patients with Parkinson's disease.

Lio, Y., et al. Virtual Reality-Based Training to Improve Obstacle Crossing Performance and Dynamic Balance in Patients with Parkinson's Disease. *Neurorehab Neural Repair*. 2015, August; 29(7): 658-667.

SMOKING AND SHORT-TERM COMPLICATIONS FOLLOWING HIP AND KNEE ARTHROPLASTY

Total joint arthroplasty is the most frequently performed orthopedic procedure in the United States. Smoking is a modifiable factor found to increase short-term complications following these surgeries. This study compared thirty-day complication rates among patients undergoing primary total hip arthroplasty (THA) or total knee arthroplasty (TKA) stratified by smoking history.

The American College of Surgeons' National Surgical Quality Improvement Program (ACS NSQIP) was queried to identify all patients with undergoing primary THA or TKA between 2006 and 2012. The database included prospectively gathered preoperative and 30-day postoperative morbidity and mortality data. Smokers were categorized as current smokers (smoking within one year of surgery) and lifetime smokers, past-year smokers or non-smokers. Former smokers were those who reported not smoking during the prior year, but who had a history of a least one lifetime period of smoking.

(Continued from page 2)

*Ilya Igonnikov, M.D., M.S.
Michael Hodde, D.O., ATC
Paul Hurd, M.D.
Adam Mullan, M.D.
Temple Univ./UPenn., Philadelphia, PA

*Lindsey J. Beck, D.O.
Logan McCool, D.O.
Parisa Salehi, M.D.
University of Minnesota, Minneapolis, MN

*Jennifer Soo Hoo, M.D.
University of Washington, Seattle, WA

*Anne Eliason, M.D.
*Sean Stockhausen, D.O.
Greg Condie, D.O.
Dan Contract, M.D.
VCU, Richmond, VA

*Jeremy Hartman, M.D.
Prateek Grover, M.D., PhD
Rucha Kharod, M.D.
Elizabeth O'Keefe, D.O.
Washington University, St. Louis, MO

Executive Editor Emeritus
Donald F. Langenbeck, Jr., M.D.

Subscription Manager
Michael P. Burke, M.S.

***Regional Managing Editors have attested that they have no financial conflict of interest when choosing articles that appear in Rehab in Review.**

Of the 78,191 patients included in this study, the multivariate analysis revealed that current smokers were more likely to experience wound complications than were former smokers and nonsmokers ($p=0.001$). In addition former smokers were more likely to experience perioperative morbidity or mortality compared with current smokers or nonsmokers ($p < 0.001$). Both current and former smokers had significantly increased total complication risks compared with non-smokers ($p=0.002$ and $p=0.001$, respectively) when stratified by lifetime pack years.

Conclusion: This study of patients undergoing hip or knee arthroplasty found that current smokers have an increased risk of wound complications, with ever smokers also having an increased risk of total complications.

Duchman, K., et al. The Effect of Smoking on Short-Term Complications following Total Hip and Knee Arthroplasty. *J Bone Joint Surg.* 2015, July 1; 97(13): 1049-1058.

Rehab in Review (RIR) is produced monthly by physicians in the field of Physical Medicine and Rehabilitation (PM&R), with the cooperation and assistance of Emory University School of Medicine, Department of Rehabilitation Medicine. The summaries appearing in this publication are intended as an aid in reviewing the broad base of literature relevant to this field. These summaries are not intended for use as the sole basis for clinical treatment, or as a substitute for the reading of the original research.

The Emory University School of Medicine designates this journal based activity for a maximum of 3 AMA PRA Category 1 Credits™. Physicians should only claim credit commensurate with the extent of their participation in the activity. The Emory University School of Medicine is accredited by the ACCME to provide continuing medical education for physicians.

RIR is affiliated with the Association of Academic Physiatrists, the World Health Organization, and the Chinese and Indian Societies of PM&R and endorsed by the International Society of Physical and Rehabilitation Medicine.

Private subscriptions are available by email at rehabinreview@aol.com or by fax or phone at (800) 850-7388.

ISSN # 1081-1303
www.rehabinreview.com



REHAB IN REVIEW

Produced by the Department of
Rehabilitation Medicine, Emory
University School of Medicine



EMORY
UNIVERSITY
SCHOOL OF
MEDICINE

Department of
Rehabilitation
Medicine

Expanding the frontier of rehabilitation sciences in research, teaching, and patient care