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Volume 22 Number 1

Published by Physicians
In Physical Medicine and Rehabilitation

January 5, 2014

ARTHROSCOPIC PARTIAL MENISCECTOMY VERSUS SHAM SURGERY

Arthroscopic partial meniscectomy is the most common orthopedic procedure performed in the United States. A recent, randomized trial demonstrated that this surgery, combined with physical therapy, provides no better relief than does physical therapy alone. This multicenter, randomized, double-blind, sham controlled trial was designed to better understand the efficacy of arthroscopic partial meniscectomy for patients with a degenerative tear of the medial meniscus.

Patients 35 to 65 years of age were enrolled who had knee pain for at least three months that was unresponsive to conventional conservative treatment. All had clinical findings consistent with a tear of the medial meniscus. Arthroscopy examination was first performed in all patients for a visual assessment of the meniscus. The patients were then randomized to receive either arthroscopic partial meniscectomy or sham surgery. Assessments were obtained at baseline and at two, six and 12 months after surgery. The primary outcome measures included knee pain after exercise, the Lysholm knee score, and the Western Ontario Meniscal Evaluation Tool, as assessed at 12 months after surgery.

Of the 146 patients undergoing randomization, 70 underwent partial meniscectomy and 76 underwent sham surgery. Significant improvement from baseline to 12 months was seen on the primary outcome measures in both groups. However, no significant differences occurred between the groups in the primary outcome measures. In addition, no significant, between group differences were seen in any of the secondary outcome measures nor in the frequency of the need for

subsequent knee surgery or serious adverse events.

Conclusion: This randomized, sham controlled study of patients with degenerative medial meniscal tears found that arthroscopic partial meniscectomy is not superior to sham surgery for relieving pain or improving function.

Sihvonen, R., et al. Arthroscopic Partial Meniscectomy versus Sham Surgery for a Degenerative Meniscal Tear. *N Eng J Med*. 2013, December 26; 369(6): 2515–2524.

NUT CONSUMPTION AND MORTALITY

Observational studies and clinical trials have suggested that nut consumption may have beneficial effects on coronary heart disease. Other studies have noted reductions in various mediators of chronic diseases with nut consumption. This study investigated nut consumption in relation to total mortality.

Data were obtained from two, large, independent cohort studies of nurses and other health professionals. The Nurses Health Study (NHS) is a prospective cohort of 121,700 female nurses from the United States, enrolled in 1976. The Health Professionals Follow-up Study (HPFS) is a cohort of 51,529, male health professionals, enrolled in 1986. For this paper's analysis, the baseline year was defined as the year of the first validated food frequency questionnaire in each study. Dietary intake was measured every two to four years. The primary endpoint was death from any cause. The final analysis included 76,464 women in the NHS and 42,498 men in the HPFS.

During 30 years of follow-up, age-adjusted and multivariate adjusted analyses revealed a significant, inverse association between frequency of nut consumption and

total mortality among both men and women. The pooled multivariate hazard ratios for death for those who ate nuts as compared to those who did not were 0.93 for consumption less than once per week, 0.89 for once per week, 0.87 for two to four times per week, 0.85 for five or six times per week and 0.8 for seven or more times per week ($p < 0.001$). Multivariate analyses indicated that nut consumption was inversely associated with the risk of most major causes of death in both men and women, including cancer, heart disease and respiratory disease.

Conclusion: This study found a significant, inverse association between the frequency of nut consumption and total mortality among both men and women.

Bao, Y., et al. Association of Nut Consumption with Total and Cause Specific Mortality. *N Eng J Med*. 2013, November 21; 369(21): 2001–2011.

EPIDURAL ETANERCEPT FOR LUMBAR DISC HERNIATION

Tumor necrosis factor- α (TNF- α) is thought to be a major cause of radiculopathy associated with symptomatic lumbar disc herniation. It is known that TNF- α is a critical mediator of nerve root inflammation, central sensitization and neuropathic pain. This study investigated the safety and efficacy of epidural etanercept (a TNF inhibitor), for the treatment of symptomatic lumbosacral disc herniation.

Forty-nine subjects diagnosed with lumbosacral radicular pain were selected from six centers in Australia between 2009 and 2010. The participants were randomized to one of four groups to receive two transforaminal injections spaced two weeks apart, including etanercept at 0.5mg, 2.5mg or 12.5 mg or a placebo. The primary outcome

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measure was the change in mean daily worst leg pain (WLP).

In the intention to treat analysis the decrease from baseline in mean, daily, WLP for the 0.5 mg etanercept group was 4.4, while that for the placebo group was 1.8 ($p=0.058$). Fifty percent of the patients in the 0.5 mg etanercept group and none in the placebo group reported a 100% reduction in mean, daily WLP scores.

Significantly greater changes in mean, daily average leg pain, worst back pain and average back pain were observed for the 0.5 mg etanercept group compared with the placebo group. Oswestry Disability Index scores also showed significantly greater improvement in the 0.5 mg etanercept group than in the placebo group. Improvements compared with placebo were also noted for the higher milligram treatment groups.

Conclusion: This randomized, double-blind, placebo-controlled trial found that transforaminal epidural etanercept, at 0.5 mg, is a safe and effective pain treatment for persistent sciatica.

Freeman, B., et al. Randomized, Double-Blind, Placebo-Controlled Trial of Transforaminal Epidural Etanercept for the Treatment of Symptomatic Lumbar Disc Herniation. *Spine*. 2013, November 1; 38(23): 1986-1994.

NSAIDS AND DEPRESSION IN OSTEOARTHRITIS

Recent studies have indicated that depression is two to three times more prevalent among patients with osteoarthritis (OA) than among patients without. A recent hypothesis has emerged attributing aspects of depression to chronic systemic inflammation. The association between cytokine release and prostaglandin synthesis and depression has led to an exploration of the benefits of anti-inflammatory agents for the treatment of depression. This study was designed to better understand whether NSAID therapy among patients with OA is associated with reduced depressive symptoms.

Pooled data were obtained from five, multicenter, randomized, double-blind, placebo-controlled trials including patients with OA. Each of these studies was six weeks in

length, with subjects at least 40 years of age and diagnosed with symptomatic OA. The participants were randomized to one of three regimens, including ibuprofen, 800 mg three times per day, naproxen, 500 mg twice per day, Celebrex, 200 mg per day or a placebo. All subjects were screened for major depression with the Patient Health Questionnaire -Nine (PHQ-9) at baseline and at six weeks follow-up.

A total of 1,497 patients were included in the analysis. After six weeks of treatment, nine percent of the subjects in the ibuprofen or naproxen group, and nine percent in the Celebrex group, compared to 14% in the placebo group, were classified as depressed. Multivariable regression analysis demonstrated a detectable effect in lowering PHQ-9 scores in the ibuprofen/ naproxen group and Celebrex group ($p=0.039$). Logistic regression analysis revealed a trend toward a treatment effect for those treated with NSAIDs as compared with placebo ($p=0.087$).

Conclusion: This pooled analysis of patients with osteoarthritis found that NSAID usage may reduce depressive symptoms.

Iyengar, R., et al. NSAIDs Are Associated with Lower Depression Scores in Patients with Osteoarthritis. *Am J Med*. 2013, November; 126 (11): 1017. e11-1017.e18.

BEETROOT JUICE AND ALTITUDE CYCLING PERFORMANCE

Dietary nitrate supplementation has been shown to reduce systolic blood pressure, attenuate the oxygen demand of submaximal exercise and improve cycling, running and rowing performance. This study investigated the effects of a single dose of nitrate rich beetroot (BR) juice on the oxygen cost, peripheral oxygen saturation and time trial performance in simulated moderate altitude conditions.

Nine competitive cyclists, all training at least three sessions per week, were studied. All were tested at baseline for determination of $\dot{V}O_{2peak}$ and maximum work rate WR_{max} in a simulated altitude of approximately 2,500 m (15% O_2). The participants then underwent four separate performance trials at 60% WR_{max} and a 16.1 km timed trial. Second and third trials were completed after

ingestion of either 70 mL of BR juice or a nitrate depleted BR placebo.

Systolic blood pressure was reduced more after BR juice ingestion than after placebo ingestion ($p=0.041$). $\dot{V}\cdot\text{O}_2$ during steady state exercise was lower in the BR juice trial than in the placebo trial ($p=0.049$). $\dot{V}\cdot\text{O}_2$ was significantly reduced in both the 12 minute and 15 minute intervals. Time trial performance improved by 2.9% in the BR juice group compared with baseline ($p=0.006$), improving significantly more in the treatment group than in the placebo group ($p=0.021$).

Conclusion: This study of competitive bicyclists found that a single dose of beetroot juice reduces the oxygen cost of steady-state exercise and enhances time trial performance at simulated altitude.

Muggerridge, D., et al. A Single Dose of Beetroot Juice Enhances Cycling Performance in Simulated Altitude. **Med Sci Sports Exer.** 2014, January; 46(1): 143–150.

FIBROMYALGIA VERSUS SMALL FIBER POLYNEUROPATHY

Fibromyalgia syndrome (FMS) is believed to have a one to five percent prevalence in Western countries. Despite this, the biologic causes of FMS remain poorly understood. As small fiber polyneuropathy (SFPN) is a neurologic cause of chronic, widespread pain, and is often undiagnosed, this study was designed to determine whether some patients diagnosed with FMS have unrecognized SFPN.

The subjects were 27 patients diagnosed with FMS and 30 matched normal controls. All subjects completed the Michigan Neuropathy Screening Instrument (MNSI) and underwent a targeted neurologic examination, which was codified using the Utah Early Neuropathy Scale (UENS). In addition, all completed the Beck Depression Inventory and the Medical Outcomes Study Short Form Health Survey (SF-36). Finally, all underwent nerve neurodiagnostic skin biopsies to assess SFPN, as well as autonomic function testing.

Of the patients with FMS, 41% had skin biopsies diagnostic for SFPN, in contrast to three percent in the control group. Subjects with FMS

also scored higher on the MNSI and the UENS than did the controls. No significant difference was seen between groups on autonomic function testing.

Conclusion: This prospective study found that some patients diagnosed with fibromyalgia have symptoms that may be attributable to small fiber polyneuropathy.

Oaklander, A., et al. Objective Evidence that Small Fiber Polyneuropathy Underlies Some Illnesses Currently Labeled as Fibromyalgia. **Pain.** 2013, November; 154(11): 2310-2316.

DIABETIC PERIPHERAL NEUROPATHY TREATMENT

Diabetic peripheral neuropathy (DPN) is a complication in approximately 50% of patients with diabetes. Two drugs approved by the United States FDA for the treatment of DPN are duloxetine and pregabalin, working at different, but potentially complementary, sites of action. This study was designed to determine whether high-dose monotherapy or combined therapy is superior for the treatment of DPN.

This multicenter, double-blind, parallel group study included 804 patients with DPN. Of those, 401 began with duloxetine at 60 mg/day and 403 began with pregabalin at 300 mg/day. After eight weeks, the subjects were randomized to a combination dose group (60 mg/day duloxetine and 300 mg/day pregabalin), or a high-dose monotherapy group (120 mg/day of duloxetine or 600 mg/day pregabalin) for another eight weeks. The primary outcome measure was the Brief Pain Inventory Modified Short Form (BPI-MSF) 24-hour average pain change. Secondary endpoints included other BPI-MSF items, the Clinical Global Impression of Improvement Scores, Patient Global Impression of Improvement Scores, Neuropathic Pain Symptom Inventory, and the Hospital Anxiety and Depression Scale.

At follow-up, no significant difference in average pain was seen between the combination group and the high-dose group. In addition, no significant difference occurred between the groups in most secondary endpoints, which consistently favored the combination

group. A non-significantly larger portion of patients in the combination group (52.1%) compared to the high-dose monotherapy group (39.3%) achieved at least a 50% reduction in 24-hour average pain ($p=0.068$). In the initial therapy period, the mean change in BPI-MSF 24 hour average pain at four and eight weeks favored the duloxetine group ($p=0.07$ and $p<0.001$, respectively).

Conclusion: This study of patients with diabetic peripheral neuropathy found that a combination of 60 mg/day of duloxetine and 300 mg/day of pregabalin is slightly superior to high-dose monotherapy for pain relief. Of the monotherapy groups, 60 mg/day of duloxetine was superior to 300 mg/day of pregabalin for pain relief.

Tesfaye, S., et al. Duloxetine and Pregabalin: High-Dose Monotherapy or their Combination? The COMBODN Study: A Multinational, Randomized, Double-Blind, Parallel Group Study in Patients with Diabetic Peripheral Neuropathic Pain. **Pain.** 2013, Dec; 154(12): 2616-2625.

TRANSCRANIAL MAGNETIC STIMULATION FOR MIGRAINE PROPHYLAXIS

Previous research has demonstrated that transcranial magnetic stimulation can disrupt cortical spreading depression. Given these data, some have suggested that high rate repetitive TMS (rTMS) may be useful to abort migraine headaches. This study further explored the benefits of rTMS for the treatment of migraines.

This study included 100 subjects, all at least 15 years of age, with more than four migraines per month. The patients were randomized to receive either three sessions of rTMS at the cortical hotspot of the right abductor digiti minimi, or sham stimulation. The primary outcome measures included reduction of migraine frequency, and decreased severity, as defined by a greater than 50% reduction on visual analogue scale (VAS) pain scores at one month. Secondary outcome measures included headache severity, functional disability, use of rescue medication and adverse events.

At one month follow-up, significantly more patients in the rTMS group showed a greater than

50% reduction of migraine frequency and severity as compared to the sham stimulation group ($p=0.001$ and $p=0.0001$, respectively). In addition, significantly greater improvement in functional disability was noted in the treatment group than in the sham group.

Conclusion: This study provides evidence that repetitive transcranial magnetic stimulation may result in short-term improvement in migraine headache frequency and severity.

Misra, U., et al. High-Rate, Repetitive Transcranial Magnetic Stimulation for Migraine Prophylaxis: A Randomized, Placebo-Controlled Study. *J Neuro.* 2013, November; 260(11): 2793-2801.

WEIGHT-BEARING AFTER MENISCAL REPAIR

Rehabilitation is an important factor for meniscal healing after surgical repair. However, the optimal rehabilitation regimen has not been previously established. This study investigated the outcome of isolated meniscal repair using either a free or a restricted rehabilitation regimen.

This prospective, randomized, controlled trial included 60 young adults with isolated meniscal injury. All underwent surgical repair and were randomized to either a free rehabilitation group, in which free range of motion and weightbearing were allowed, beginning on the second postoperative day, or to a restricted group, in which range of motion and weight bearing were restricted for six weeks postoperatively. The participants were assessed at three, 12 and 24 months postoperatively with the Knee Osteoarthritis Outcome Score (KOOS) and the Tegner Function Score. The primary outcome variable was surgery failure, as evaluated at repeat arthroscopy, in patients with continuous symptoms, or recurrence of symptoms within the two-year study.

At 24-month follow-up, nine patients in the free, and ten in the restricted rehabilitation groups had non-healed menisci identified at arthroscopy. At two-year follow-up, KOOS pain scores were 82 in the restricted group and 87 in the free range group, while Tegner scores were 4.1 in the restricted group and

4.5 in the free range group. Neither difference was significant.

Conclusion: This prospective study suggests that free rehabilitation after meniscus repair is safe and does not result in increased failure rates as compared with a weight and range of motion restricted rehabilitation protocol.

Lind, M., et al. Free Rehabilitation Is Safe after Isolated Meniscus Repair: A Prospective, Randomized Trial Comparing Free with Restricted Rehabilitation Regimens. *Am J Sports Med.* 2013, December; 41 (12): 2753-2758.

ASSOCIATION BETWEEN MULTIPLE SCLEROSIS AND EPILEPSY

Epilepsy is a common, chronic neurologic condition which is caused by abnormal electrical activity in the brain. Focal lesions such as tumors, hemorrhages or abscesses can act as a nidus for epileptic activity. However, little information is available concerning whether the focal lesions caused by multiple sclerosis (MS) can cause epilepsy. This study investigated the association between these two conditions.

Two statistical data sets were queried, the English National Hospital Episode Statistics (1999-2011), provided by the NHS Information Centre, and the English National Death Registration Data, provided by the Office for National Statistics. Also included were data from the Oxford Record Linkage Study (ORLS), which spans 1963 to 1998. These databases were reviewed to identify individuals admitted with a diagnosis of MS, and to compare the rate of epilepsy within this cohort to that of those in the database without a diagnosis of MS.

A diagnosis of MS was made for 3,913 people in the ORLS data set and for 85,772 in the all England data set. Following hospital admission for MS, the relative risk of subsequent admission for epilepsy as compared with the control group was 4.1 in the ORLS cohort and 3.3 in the all England cohort. Those with epilepsy had an increased risk of MS, with relative risks of 2.5 in the ORLS cohort and 1.9 in the all England cohort.

Conclusion: This large, population-based study found a strong link, possibly bidirectional,

between multiple sclerosis and epilepsy.

Alan, A., et al. Association between Multiple Sclerosis and Epilepsy: Large, Population-Based, Record Linkage Studies. *BMC Neurol.* 2013, December; 13: 189.

CEREBROLYSIN FOR MILD TRAUMATIC BRAIN INJURY

Traumatic brain injury (TBI) is a leading cause of disability and death. Approximately 80% of TBIs are mild, but can still result in significant impairment in cognitive function. Cerebrolysin is a nootropic drug that has demonstrated efficacy in the treatment of patients with Alzheimer's disease, with preliminary trials suggesting a role in the treatment of ischemic stroke. This study was designed to determine the efficacy and safety of Cerebrolysin in the treatment of mild TBI.

Subjects included patients between the ages of 30 and 70 years, with a TBI with intracranial contusion hemorrhage without the need for craniotomy. The patients were randomized to receive once daily intravenous Cerebrolysin (group A) or a placebo (group B), administered over five days. The primary outcome measures were the differences between baseline and weeks one, four and 12 in outcomes on the Mini Mental Status Examination (MMSE) and the Cognitive Abilities Screening Instrument (CASI).

Thirty-two patients were studied, including 17 patients in group A and 15 in group B. The difference in CASI scores between baseline and week 12 were significantly greater in group A than in group B (20 versus 7.6, respectively; $p=0.046$). Significant differences on the MMSE were found in group A upon comparing baseline with weeks one, four and week 12 ($p=0.024$, $p<0.001$ and $p=0.001$ respectively). The differences between the treatment and the control group however did not differ. Subtests of drawing and long-term memory were significantly more improved between baseline and week 12 in Group A than in group B ($p=0.047$ and $p=0.026$ respectively).

Conclusion: This study of patients with mild traumatic brain injury found that Cerebrolysin, if initiated within 24 hours after the onset of brain injury with cerebral

contusion, can improve cognitive recovery.

Chen, C., et al. Cerebrolysin Enhances Cognitive Recovery of Mild Traumatic Brain Injury Patients: Double-Blind, Placebo-Controlled, Randomized Study. **Br J Neurosurg.** 2013, December; 27(6): 803-807.

ANTI-DEMENTIA MEDICATIONS AND GAIT SAFETY IN ALZHEIMER'S DISEASE

A limited number of studies have suggested that, among patients with dementia, both memantine and donepezil use may reduce gait variability. This study compared these medications' ability to affect gait in patients with Alzheimer's disease (AD).

This prospective, nonrandomized, case-control trial included patients with mild to moderate AD and related disorders (ADRD), treated with an acetylcholinesterase inhibitor (CEI) a N-Methyl-D-Aspartate (NMDA) receptor antagonist, or a control group taking neither. The choice of the anti-dementia drug was based upon the severity of the cognitive decline. All underwent gait analysis, with measurements including the coefficient of variation of stride time and walking speed.

Stride time decreased significantly after medication treatment, with this change attributed to NMDA antagonists ($p=0.01$) more than CEIs. Additional associations with decreased stride time included female gender ($p=0.046$) and high baseline Mini Mental State Exam scores ($p=0.003$).

Conclusion: This pilot study of patients with Alzheimer's disease suggests that treatment with an NMDA antagonist may result in improved gait stability, with no such findings for acetylcholinesterase inhibitors.

Beauchet, O., et al. Anti-Dementia Drugs and Changes in Gait: A Pre-Post Quasi Experimental Pilot Study. **BMC Neurol.** 2013, November, 13: 184.

ULNAR NERVE MORBIDITY AFTER HUMERAL FRACTURE

Supracondylar humeral fracture is one of the most common elbow

fractures in children, representing two to seven percent of all pediatric fractures. The incidence of primary nerve injury in dislocated supracondylar fractures is as high as 20%. This study evaluated the long-term morbidity of the ulnar nerve after a supracondylar humeral fracture.

This retrospective study reviewed a cohort of 91 patients under 16 years of age from two centers in Finland. All subjects were hospitalized with a supracondylar humeral fracture between 1992 and 2000. Half of the patients underwent surgery. These cases were re-examined at follow-up, averaging 12 years after the primary injury.

At 12-year follow-up, seven cases had ulnar nerve symptoms, with four of those demonstrating pure sensory ulnar neuropathy. One case demonstrated diminished control over the muscles innervated by the ulnar nerve. The four cases with ulnar neuropathy had undergone surgery, with three of those initially fixed by wire. All of the cases with secondary ulnar neuropathy presented with diminished axial angles of the elbow, as compared to uninjured side. All with secondary neuropathy had a good result, with no symptoms at three-month follow-up.

Conclusion: This study of patients with pediatric supracondylar humeral fractures found that 4.4% had ulnar neuropathy at 12-year follow-up.

Sinikumpu, J., et al. Ulnar Nerve Morbidity as a Long-term Complication of Pediatric Supracondylar Humeral Fracture. **Musculoskel Surg.** 2013, 10.1007/s12306-013-0291-4.

ULTRASOUND TO DIFFERENTIATE BETWEEN POLYNEUROPATHIES

In acquired and inherited peripheral polyneuropathy, ultrasound (US) can detect nerve enlargement. Recently, patterns of enlargement, determined at different locations along the nerve length, have been proposed as a way to characterize types of neuropathy. This US study was designed to describe and compare patterns and degrees of nerve size changes in acquired and inherited demyelinating polyneuropathy.

This retrospective study compared US findings of patients with demyelinating Charcot Marie Tooth type 1 (CMT-1), chronic inflammatory demyelinating polyneuropathy (CIDP), Guillain-Barré Syndrome (GBS) and multifocal motor neuropathy (MMN). Images were obtained at four standard sites in one arm for each subject. As nerve sizes can vary by height, measured nerve sizes were translated to a nerve size index (NSI), comparing the measured to the expected nerve size. A nerve with an NSI of above two standard deviations of the mean was considered enlarged. Enlargement patterns were classified as mild, regional or diffuse.

Nerves in both CMT-1 and acquired demyelinating polyneuropathy were larger than those in controls. Nerves were enlarged at one or more sites in 100% of subjects with CMT-1, 80% with CIDP, and 65% with MMN. A diffuse enlargement pattern was more common in CMT-1 than CIDP, GBS, or MMN ($p < 0.001$). In addition nerve enlargement to more than twice normal size was more common in CMT-1 ($p < 0.001$) than in acquired neuropathies.

Conclusion: This ultrasound study found that median and ulnar enlargement in CMT-1 is nearly always present, and is typically diffuse.

Zaidman, C., et al. Ultrasound of Inherited versus Acquired Demyelinating Polyneuropathies. **J Neur.** 2013, Dec; 260(12): 3115-3121.

SUPRASCAPULAR NERVE BLOCK FOR POST-STROKE SHOULDER PAIN

Population-based studies suggest that approximately one fourth of stroke survivors develop hemiplegic shoulder pain. This pain is associated with reduced functional ability, a higher incidence of depression, interference with rehabilitation and an increased length of hospitalization. This randomized, controlled trial investigated the efficacy of a suprascapular nerve block for the treatment of hemiplegic shoulder pain.

Adult subjects with post-stroke hemiplegic shoulder pain were recruited from acute stroke and

rehabilitation wards across Adelaide, South Australia. The patients were randomized to receive either a suprascapular nerve block (1 ml of 40 mg/ml methylprednisolone and 10 ml of 0.5% bupivacaine) or a placebo subcutaneous injection with normal saline. The participants were assessed before randomization and at one, four and 12 weeks post-injection. The primary outcome variable was pain, as measured with a visual analogue scale (VAS).

The reduction in pain was significantly greater in the treatment group than in the normal saline group at weeks one, four and 12 ($p=0.02$, $p=0.01$ and $p=0.02$, respectively). At four weeks, 78% of the treatment group reported an improvement in symptoms, with 80% of those responders demonstrating at least a 20 mm improvement on a 100 mm VAS. Despite this pain reduction, no significant impact was noted on the secondary outcomes of function and quality of life.

Conclusion: This study of patients with post-stroke shoulder pain found that a suprascapular nerve block can provide significant pain relief in the first year after stroke.

Adey-Wakeling, Z., et al. Suprascapular Nerve Block for Shoulder Pain in the First Year after Stroke: A Randomized, Controlled Trial. *Stroke*. 2013, Nov; 44(11): 3136-3141.

LONG-TERM MORTALITY IN YOUNG ISCHEMIC STROKE

Few studies with sufficiently large data sets have investigated trends in the survival and risk of death following first ischemic stroke among adults younger than 55 years of age. This study investigated trends in long-term mortality among adults aged 18 to 54 years hospitalized for ischemic stroke between 1987 and 2006.

This Swedish study used data from the National Inpatient Register, established in 1964 to identify individuals hospitalized with ischemic stroke since 1987. From these records, 10,677 men and 6,373 women were identified, each of whom had survived at least 28 days after hospitalization with a principal diagnosis of ischemic stroke. Trends in mortality were compared by age and gender over time.

Of the young stroke survivors, 26.4% were between 18 and 44 years of age and 73.6% were between 44 and 54 years. Reviewing by four-year intervals, starting in 1987, the mortality risk decreased by 32% in men and 45% in women. Despite this finding, this cohort had a six-fold increased risk of dying, as compared with the general population. The most common cause of death was cardiovascular disease, accounting for 50.3% of men and 36.4% of women.

Conclusion: This Swedish study of adults ages 18 to 54 years with first ischemic stroke found that, between 1987 and 2006, the long-term mortality improved, but remained considerably higher than that of the general population.

Giang, K., et al. Twenty-Year Trends in Long-Term Mortality Risk in 17,149 Survivors of Ischemic Stroke Less than 55 Years of Age. *Stroke*. 2013, December; 44(12): 3338-3343.

ANKLE BRACHIAL INDEX AND STROKE OUTCOME

The ankle brachial index (ABI) is used to evaluate atherosclerosis by dividing the systolic pressure in the leg by the systolic pressure in the arm. Strong associations have been found between the ABI and coronary artery disease and stroke. This study investigated the impact of ABI on the five-year outcomes of patients with first-ever ischemic stroke.

Over a six-year period, all eligible patients admitted to the ischemic stroke service at a university hospital in Greece were included in this study. On admission, the subjects underwent a brain CT scan, chest x-rays, and electrocardiograms. Admission data were recorded, including stroke severity, underlying stroke pathophysiology, and risk factors. An ABI was determined for all patients between day five of hospitalization and discharge. An ABI of 0.9 or less in either leg was considered pathologic, with those greater than 0.9 considered normal. All patients were followed up at months one, three, and six, and yearly thereafter. The primary endpoint was a five-year cardiovascular composite, defined as recurrent stroke, myocardial infarction and cardiovascular death, as well as overall mortality.

Among the subjects, 19.8% were identified with an ABI of 0.9 or less. The cumulative composite cardiovascular endpoint at five years occurred more frequently among those with low ABIs than among those with normal ABIs ($p = 0.007$). A multivariate Cox regression analysis showed that age and a low ABI were independent predictors of the composite cardiovascular endpoint. A higher mortality rate was noted among patients with a low ABI ($p=0.001$).

Conclusion: This study found that, among patients with first acute ischemic stroke, an ankle brachial index of less than 0.9 is associated with an increased five-year risk of cardiovascular events and death.

Milionis, H., et al. Ankle Brachial Index and Long-Term Outcome after First-Ever Ischemic Stroke. *Euro J Neur*. 2013, Nov; 20: 1471 – 1478.

BICYCLE TRAINING IN BOYS WITH DUCHENNE MUSCULAR DYSTROPHY

Functional decline in patients with Duchenne muscular dystrophy (DMD) is thought to primarily result from progressive loss of muscle strength and endurance. The resultant decrease in activity leads to secondary deterioration of the musculoskeletal and cardiovascular systems, further accelerating the decline. This trial evaluated whether dynamic exercises could safely counteract the secondary functional decline of patients with DMD.

Subjects were boys between seven and 13 years of age, all diagnosed with DMD. The participants were divided into an intervention group and a control group. The intervention group received assisted bicycle training of the arms and legs for 15 minutes a day, five days a week, for 24 weeks. The control group received the usual care during the same period, followed by the training regimen. Primary outcome measures were the Motor Function Measure (MFM) and the Assisted Six-Minute Cycling Test (A6MCT). Secondary outcome measures included the Pediatric Evaluation of Disability Inventory (PEDI), timed tests (rise from floor, 10-meter run, nine-hole peg test), muscle strength, passive joint range

of motion, and quantitative muscle ultrasound (QMUS).

At follow-up evaluation, the mean, total MFM score remained stable in the intervention group and was significantly decreased in the control group. No differences between the groups were noted in the A6MCT for the legs ($p=0.06$) or the arms ($p=0.71$). Finally, no significant between group differences were found on the secondary outcome measures.

Conclusion: This study of patients with Duchenne muscular dystrophy found that assisted bicycle training can delay functional decline.

Jansen, J., et al. Assisted Bicycle Training Delays Functional Deterioration in Boys with Duchenne Muscular Dystrophy: A Randomized, Controlled Trial "No Use is Disuse". **Neurorehab Neural Repair**. 2013, Nov/Dec; 27(9): 816-827.

AGE AND ANTERIOR CRUCIATE LIGAMENT SURGERY OUTCOME

Anterior cruciate ligament (ACL) rupture is among the most common sports injuries. With life expectancy rising, and continued sports activity into middle-age, the interest in ACL reconstruction in patients over 40 years of age is expected to grow. This study compared the clinical outcomes of patients over the age of 40 years with those 40 years of age or under at the time of ACL surgery.

From a pool of 830 patients who underwent ACL reconstruction between 2002 and 2010, 36 patients over the age of 40 years were available for follow-up. The outcomes of these patients were compared with those of a group of patients 30 to 40 years of age and a second group of patients less than 30 years of age at the time of surgery. The latter two groups' data were obtained from previously published data taken from the same institution. All groups were treated with the same rehabilitation program, with functional status at follow-up evaluated using the Lysholm score and the International Knee Documentation Committee 2000 score (IKDC 2000). Knee stability was assessed with the Lachman test, a pivot shift test and a KT-1,000 arthrometric test.

Subjective Lysholm scores averaged 97 in the youngest group, 94 in the 30- to 40-year-old group and

93 in the over 40-year-old group (not statistically different). Mean, side-to-side differences in anterior knee translation, as measured by the KT-1,000, were significantly less in the older group than in the two younger groups.

Conclusion: This study of patients over 40 years of age undergoing anterior cruciate ligament reconstruction found similar subjective improvement when compared with younger patients, with significantly better results on the KT-1000 arthrometric examination in the older group.

Fabio, C., et al. Knee Stability after Anterior Cruciate Ligament Reconstruction in Patients Older than 40 Years: Comparison between Different Age Groups. **Int Orthop**. 2013 Nov; 37(11): 2265-2269.

EIGHTH JOINT NATIONAL COMMITTEE: MANAGEMENT OF HYPERTENSION

Hypertension is known to increase the risk of myocardial infarction, stroke, renal failure and death. The Institution of Medicine appointed panel members to the Joint National Committee Eight (JNC8), from more than 400 nominees, to establish evidence statements and recommendations for blood-pressure treatment. This paper reports on those recommendations.

The JNC8 used rigorous, evidence-based methods to answer three questions. First, in adults with hypertension, does initiating pharmacotherapy at specific blood pressure thresholds improve outcomes? Second, in adults with hypertension, does pharmacotherapy to a specified blood pressure goal lead to improvements in health outcomes? Third, in adults with hypertension, do various antihypertensive drugs differ in comparative benefits?

Recommendations for the general population at least 60 years of age were to initiate pharmacologic treatment to reduce systolic blood pressure (SBP) to <150 mmHg or diastolic blood pressure (DBP) to <90 mmHg. In the general population under 60 years of age, it was recommended that pharmacotherapy be initiated to reduce diastolic blood pressure to <90 mmHg. Further, in the general population at least 18

years of age with diabetes or chronic kidney disease, it was recommended that treatment reduce SBP to <140 mmHg and DBP to <90 mmHg.

The JNC8 further recommended that, in general, in the nonblack population, initial antihypertensive treatment should include a thiazide type diuretic, calcium channel blocker, angiotensin converting enzyme inhibitor or angiotensin receptor blocker. For the black population, initial treatment should include a thiazide type diuretic or a calcium channel blocker.

Conclusion: This paper reports on the Eighth Joint National Committee of the Institute of Medicine's recommendations by age and race for the treatment of high blood pressure in adults.

James, P., et al. 2014 Evidence-Based Guidelines for the Management of High Blood Pressure in Adults: Report from a Panel of Members Appointed to the Eighth Joint National Committee (JNC8). **JAMA**. 2013, Dec 18 doi: 10.1001/jama.2013.284427.

EARLY MORTALITY AFTER HIP FRACTURE REPAIR

Despite improvements in perioperative care, the 30 day mortality rate after hip fracture surgery is estimated to be over 13%. This excess mortality is highest in the immediate period following the fracture, and appears to decrease with time thereafter. This study further assessed the 30-day mortality rate after hip fracture surgery and reviewed the causes and risk factors of early mortality.

Consecutive patients admitted to the authors' institution with a hip fracture between April of 2009 and March of 2010 were included in this study. Primary and secondary causes of death were noted from death certificates and coroners' reports. The records were reviewed to collect data on comorbidities, age, gender, the American Society of Anesthesiologists (ASA) grading, source of admission and pre-injury walking ability. Those undergoing surgery within 48 hours (group 1) were compared with those undergoing surgery later than 48 hours (group 2), a time frame based upon recommendations of the British Orthopedic Association.

(Continued from page 2)

*Chulhyun Ahn, M.D., MS
UPenn Health System, Philadelphia, PA

*Thiru Annaswamy, M.D.
Trixy Syu, D.O.
UTSW Medical Center, Dallas TX

*Rachel Hallmark, M.D., Ph.D.
UVA, Charlottesville, VA

*Ryan Solinsky, M.D.
Jennifer Soo Hoo, M.D.
Sarah Wittry, D.O.
University of Washington, Seattle, WA

*Bonnie Weigert, M.D.
University of Wisconsin, Madison, WI

*William Robbins, M.D.
Angel Chang, M.D.
Udayan Kulkarni, M.D.
Heather Martin, M.D.
James Newman, M.D.
Don Tower, D.O.
VCU, Richmond, VA

*Adam J. Schulte, M.D.
Laura Giganti, M.D.
Prateek Grover, M.D., PhD
Aarti Soorya, M.D.
Washington University, St. Louis, MO

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The overall, 30-day mortality rate was 7.5%. The mortality rate of group 1 was four percent, and that of group 2 was 11% ($p=0.006$). Over two thirds of 30-day mortality occurrences were due to pneumonia or acute myocardial infarction. In a multivariate analysis, risk factors for early death included time to surgery ($p=0.051$) history of cardiac disease ($p=0.001$) and admission source other than own home ($p=0.001$)

Conclusion: This retrospective study of 467 consecutive individuals undergoing hip fracture surgery found that patients at greater risk of dying within 30 days of surgery are care dependent prior to injury, have a history of cardiovascular disease and have a delay of over 48 hours from admission to surgery.

Khan, M., et al. Predictors of Early Mortality after Hip Fracture Surgery. *Intern Orthop.* 2013, November; 37: 2119-2124.

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.

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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



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