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## LUMBAR EPIDURAL GAS CONTAINING PSEUDOCYSTS CAUSING RADICULAR PAIN

Degenerative intradiscal vacuum phenomenon is commonly detected in radiologic studies of the aging spine. Intradiscal gas can herniate to the epidural or intradural space, and may create pseudocysts. Gas containing pseudocysts may compress neural structures and induce radicular pain and neurologic symptoms. This study retrospectively reviewed the characteristics and outcomes of patients with gas containing pseudocysts who were treated surgically.

Sixty-nine pseudocysts in 61 patients were detected by CT and MRI between 2005 and 2010. Surgery included pseudocyst removal, neural decompression and fusion surgery in 12 patients with symptomatic spinal stenosis or instability, and microscopic removal of pseudocysts in 10 patients without symptomatic spinal stenosis or instability. All subjects underwent lumbar plain x-rays, CT scans and MRI scans before surgery. Radiologic parameters were reviewed and lumbar degeneration quantified. Preoperative clinical parameters were recorded, and surgical outcomes were assessed using visual analog scores (VAS) for leg pain and the Oswestry Disability Index (ODI). Outcome data were obtained before and eight weeks after surgery.

Pseudocysts were distributed from L2-S1 in all of the patients. The pseudocysts were classified according to three types, canal (48%), foraminal (32%) and extraforaminal (20%). All participants had degenerative vacuum discs and osteophytes at the affected levels, with 59.1% demonstrating spinal stenosis, and 18.2% demonstrating segmental instability. Symptoms of significant neurological compromise occurred in 22.7% of the patients. Both the mean VAS and the mean

ODI decreased significantly after surgery ( $p < 0.05$ ). All symptoms of neurologic compromise improved after surgery.

**Conclusion:** This retrospective study identified 22 patients with lumbar gas containing pseudocysts whose surgical resection resulted in significantly improved symptoms.

Kuh, S., et al. Lumbar Epidural Gas Containing Pseudocysts as a Cause of Severe Radicular Pain. *Joint Bone Spine*. 2011, July; 78(4): 398-41.

## MENTAL PRACTICE SESSIONS FOR UPPER EXTREMITY FUNCTION FOLLOWING STROKE

Previous studies have demonstrated that, following a stroke, repetitive tasks involving the affected side can result in cortical remodeling and resultant functional gains. Practice involving mental rehearsal of the repetitive tasks has been found to contribute to this cortical remodeling. This study was designed to determine the optimal duration of mental practice sessions.

This single-blinded, randomized, controlled study included patients between the ages of 18 and 75 years, all not currently undergoing therapy. Each had a history of stroke more than one year previously, with resultant mild hemiparesis. The subjects were randomized into four groups, with all receiving 30 minute, repetitive task specific practice sessions three times per week for 10 weeks. After the sessions, the subjects were assigned to one of three mental practice session groups, all prompted by audiotaped mental practice intervention. The group assignments were for 20, 40 or 60 minute sessions. A control group listened to 20 minutes of sham audiotape. Outcome measures included arm impairment, graded using the Fugal-Meyer motor assessment (FM), and affected arm

functional limitation reductions, measured by the Action Research Arm Test (ARAT).

A total of 29 patients were studied, with a mean time since stroke of 36 months. On the primary outcome measure, the FM, the data revealed that increased mental practice time resulted in greater improvement in FM scores ( $p = 0.05$ ). However, on the ARAT, a dose response effect was not observed. Regardless of dosing conditions, subjects who were administered mental practice exhibited larger score changes on both the FM and ARAT than did subjects who did not undergo mental practice.

**Conclusion:** This study of patients with chronic stroke found that, when combined with repetitive task specific practice, mental practice reduces affected upper extremity impairment. Of the practice times tested, 60 minutes resulted in the greatest improvement.

Page, S., et al. Larger versus Shorter Mental Practice Sessions for Affected Upper Extremity Movement after Stroke: A Randomized, Controlled Trial. *Clin Rehab*. 2011, July; 25(7): 627-637.

## JOINT MOBILITY IN ELDERLY SUBJECTS WITH TYPE II DIABETES

Limited joint mobility (LJM) is frequently seen in subjects with diabetes mellitus (DM). Aging is also characterized by LJM. In both conditions, the most important underlying biochemical abnormality is the non-enzymatic glycosylation of collagen with advanced glycation end product formation. This study investigated whether type II DM (NIDDM) increases the risk of LJM in the elderly, and whether tendon degeneration may be associated with this process.

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Thirty patients with NIDDM were recruited from the outpatient service of the Department of Medicine and Science of Aging of Chieta-Pescara University in Italy. All subjects had good glycemic control and were living independently in the community. All underwent examination, including active range of motion and ultrasound examination of tendons. The ultrasound findings were classified as: a) normal appearance, b) minor lesions, or c) major lesions. Full thickness tears were then classified as small, large or massive.

Significantly greater reduction in joint mobility was found in elderly subjects compared to younger ones for all the joints measured except knee flexion and elbow flexion. Elderly patients with diabetes, compared with their age-matched counterparts, showed reduced joint mobility for ankle dorsiflexion and ankle plantarflexion, hip flexion and hip adduction, shoulder adduction and shoulder flexion. Significantly more patients with diabetes had degenerative changes in the Achilles tendon, while no significant differences between groups were noted for the patellar tendon.

**Conclusion:** This study of elderly subjects with type II diabetes mellitus found that diabetes worsens joint motion and is associated with greater degenerative changes in tendons, as compared with their non-diabetic counterparts.

Abate, M., et al. Limited Joint Mobility (LJM) in Elderly Subjects with Type II Diabetes Mellitus. *Arch Gerontol Geriatr.* 2011, September-October; 53(2): 135-140.

### **EFFECTS OF VITAMIN D ON ATHEROSCLEROSIS**

Previous studies have demonstrated that carotid plaque thickness (CPT) and intima media thickness (IMT) are powerful predictors of future cardiovascular (CV) events. Recent epidemiological studies have demonstrated that 25-hydroxy vitamin D deficiency is a novel CV risk factor, predicting both CV events and mortality. The mechanisms of this process are unclear. To better understand this relationship, this study investigated the effects of vitamin D deficiency and other mineral metabolism on

carotid plaque thickness and intima media thickness.

The Northern Manhattan Study (NOMAS) involved a multi-ethnic urban population of 3,298 individuals, assembled to investigate the incidence of vascular events, risk factors and vascular outcomes. From this group, 203 individuals were consecutively chosen for serum analysis of calcium, albumin, phosphorus, parathyroid hormone, 25-hydroxyvitamin D and 1-25 hydroxyvitamin D. All subjects also underwent high-resolution carotid ultrasound to record the number of carotid plaques, as well as maximal carotid plaque thickness and IMT. Ultrasound findings were compared with lab values.

After adjusting for comorbidities, the number of plaques was associated with increased phosphorus levels and increased calcium phosphorus product in the entire group. After narrowing the scope to patients with carotid plaques, a direct correlation was seen between 25-hydroxyvitamin D deficiency and increased IMT and maximal carotid plaque thickness, but not plaque number.

**Conclusion:** This study found direct relationships of increased intima media thickness and maximal carotid thickness with hydroxyvitamin D deficiency in patients with carotid plaques. The findings did not show that vitamin D deficiency is associated with the development of plaques, but found that, once formed, this deficiency was associated with progression of atherosclerosis.

Angela, C., et al. Vitamin D Deficiency is Associated with Subclinical Carotid Atherosclerosis: The Northern Manhattan Study. *Stroke.* 2011, August; 42(8): 2240-2245.

### **TOTAL KNEE ARTHROPLASTY AND STIFF KNEE**

Total knee arthroplasty (TKA) is a common procedure, used to relieve pain caused by severe arthritis. Stiffness can complicate up to 5% of TKA surgeries. This study evaluated the results of patients with TKA, comparing those with and without stiff knees.

This retrospective study included 32 individuals with stiff knees and 32 individuals with flexible knees. The

patients were followed for an average of 4.5 years after surgery. Stiff knee was defined as a pre-operative range of motion of less than 50°. After surgery, patients were monitored for complications, comparing the two groups.

In the stiff group, 21.8 % reported complications, including four infections, one skin necrosis, one early contracture and one late stiffness of the knee. The flexible group had two reported complications, one early contracture and one leg stiffness. Postoperative range of motion in the stiff group was 87.4°, while that in the flexible group was 106.6°. Good outcomes were reported in 92% of the stiff knee group and 97% of the flexible knee group.

**Conclusion:** This study of patients undergoing total knee arthroplasty found that those with less than 50° of range of motion prior to surgery have more complications and worse outcomes.

Fosco, M., et al. Total Knee Arthroplasty in Stiff Knees Compared with Flexible Knees. **Musculoskel Surg.** 2011; 95: 7-12.

#### **PATIENT SATISFACTION TWO YEARS AFTER TOTAL KNEE ARTHROPLASTY FOR OSTEOARTHRITIS**

The prevalence of knee osteoarthritis (OA) among individuals older than 70 years of age ranges from 20% to 50%. Total knee arthroplasty (TKA) is a treatment option for patients with incapacitating advanced knee OA. This study was designed to identify factors predicting patient satisfaction two years after TKA for OA.

This prospective study included 299 patients undergoing TKA for knee OA. Data collected at baseline included age, gender, disease duration, body mass index, pain, function, radiographic findings, depression, location of surgery, sporting activity, occupation and referral pattern. Two year follow-up data collected included satisfaction, pain, function, affect, analgesic use, surgical complications and comorbidities.

Two hundred sixty-four patients were available for study completion. At two years, patient satisfaction ratings were 100% for 53.4% of the

patients, 75% for 36.4% of the patients, 50% for 4.5% of the patients, 25% for 2.7% of the patients and 0% for 3.4% of the patients. Pain scores, Lequesne Index scores and WOMAC index scores decreased significantly between baseline and the two-year evaluation. The proportion of patients who used analgesics on a regular basis decreased from 78% at baseline to 30% after two years.

Compared to satisfied patients, dissatisfied patients had a significantly higher body mass index and significantly higher mean Lequesne index scores, and reported a higher levels of depression at two year follow-up. A baseline joint space narrowing score of more than three was more common in the satisfied than in the dissatisfied group.

**Conclusion:** This study of patients undergoing total knee arthroplasty for osteoarthritis of the knee found a high level of satisfaction two years after surgery. Data showed that patients over 70 years of age, who were not obese and had a severe joint space narrowing, enjoyed a higher rate of success.

Merle-Vincent, F., et al. Factors Predicting Patient Satisfaction Two Years after Total Knee Arthroplasty for Osteoarthritis. **Joint Bone Spine.** 2011, July; 78(4): 383-36.

#### **NONINVASIVE SPINE FUSION**

Of the more than one million bone grafts performed worldwide, 50% have involved spinal fusion. Of these, 25% patients complained of donor site pain for up to two years after surgery. Among proposed alternative treatments is the use of bone morphogenic proteins (BMPs) to help induce bone formation. This study assessed the ability of a single injection of a cell-based gene therapy system to achieve a reliable spine fusion.

This animal study involved eighty-seven immunodeficient and immunocompetent mice. The animals were injected with fibroblasts transduced with an adenoviral vector to express BMP2 along the paraspinal muscles, in order to achieve a rapid induction of heterotopic ossification (HO) and spinal arthrodesis. The resultant bone formation was evaluated with radiographs, microcomputed

tomography and biomechanical analysis.

A fusion between the vertebrae and adjacent skeletal bone was obtained as early as two weeks. Reduction in spinal flexion- extension also occurred as early as two weeks post-injection. At two weeks there was 100% fusion in the immune competent mice, and 44% fusion in the immune deficient mice. More than 90% fusion occurred by four weeks in all animals. The new bone appeared to be limited to the regions that received the cell injections.

**Conclusion:** This animal study demonstrated that the injection of a cell-based system, using an adenoviral vector to induce the expression of bone morphogenic protein, was effective in inducing spinal fusion in both immune competent and immune deficient mice.

Olabisi, R., et al. An Injectable Method for Noninvasive Spine Fusion **The Spine J.** 2011, June; 11(6): 545-556.

#### **ANTERIOR SPINE SURGERY AND DYSPHAGIA**

During the 1990s, more than 500,000 anterior cervical (AC) discectomy and fusion (ACDF) surgeries were performed in the United States for a range of conditions. These surgeries have been known to have postoperative complications, with dysphagia being a common cause of post-operative morbidity. This study was designed to determine the extent of dysphagia before and after surgery among individuals undergoing AC surgery.

Patients undergoing AC surgery were recruited as subjects, while patients undergoing posterior lumbar (PL) surgery were enrolled as controls. The 18 patients undergoing AC surgery and 11 controls were prospectively enrolled. The Swallow Quality of Life (SWAL-QOL) survey was used to assess for dysphagia before, and then three weeks and 1.5 years after surgery.

At three weeks post-surgery, the SWAL-QOL scores were significantly worse for the AC group than for the PL group (p=0.001). No significant difference was found between the two groups at the 1.5-year follow-up visit. A review of patient factors revealed that smokers had lower (worse)

scores at three weeks post-surgery than did nonsmokers ( $p = 0.002$ ). In addition, patients with COPD had lower scores preoperatively ( $p = 0.002$ ), at three weeks ( $p = 0.001$ ) and at 1.5 years ( $p = 0.16$ ).

**Conclusion:** This study found that patients undergoing anterior cervical surgery are more likely to have postoperative dysphagia than are those undergoing posterior lumbar surgery. However, this difference did not persist when measured at 1.5-year follow-up.

Siska, P., et al. Dysphagia after Anterior Cervical Spine Surgery. A Prospective Study Using the Swallowing Quality of Life Questionnaire and Analysis of Patient Comorbidities. *Spine*. 2011, August 1; 36(17): 1387-1391.

### BACLOFEN PUMP MALFUNCTION

Since 1984, intrathecal baclofen (ITB) has been used to reduce spasticity of multiple etiologies. Unfortunately, system malfunctions can occur, most commonly involving catheter and connector failure. Imaging is essential for evaluating this system failure. This study provides a retrospective analysis of data pertaining the feasibility, efficacy and utility of using combined C-arm fluoroscopy and C-arm cone beam CT for evaluating ITB delivery systems.

Seven cases, including six males and one female, with a mean age of 15 years, were studied. Six patients had spastic quadriplegia or quadriparesis related to cerebral palsy, and one patient had spastic quadriparesis secondary to anoxic ischemic encephalopathy. Study variables included indications for evaluation, imaging results, interventions, correlations of surgical findings with imaging and clinical outcomes.

When combining C-arm fluoroscopy with cone beam CT, the ITB pumps and entire catheter systems were fully visualized for all patients. Catheter problems were detected in four cases, including disconnection, microfracture, fracture with segment migration and subdermal migration. At surgery, intraoperative findings correlated with those of imaging. In those with normal imaging studies, surgery was

deferred and spasticity improved or stabilized after dose adjustments.

**Conclusion:** This study demonstrates that the combination of C-arm fluoroscopy and cone beam computed tomography provides an accurate evaluation of intrathecal baclofen pump system malfunction.

Schapiro, A., et al. Combined C-Arm Fluoroscopy and C-Arm Cone Beam Computed Tomography for the Evaluation of Patients with Possible Intrathecal Baclofen Delivery System Malfunctions. *Neurosurg*. 2011,10.1227/NEU.0b013e31821663a4; ons27-ons33.

### ANTIEPILEPTIC DRUGS AFTER INTRACEREBRAL HEMORRHAGE

Patients with intracerebral hemorrhages are at increased risk for early seizures and subsequent development of epilepsy. Prophylactic antiepileptic drugs are commonly used to prevent seizures, although the efficacy of this treatment approach is not clear. This study evaluated whether patients with acute intracranial hemorrhage benefit from taking prophylactic antiepileptic drugs (PAED).

This retrospective study included 157 patients, all at least 18 years of age, who were hospitalized for acute, spontaneous ICH. Of these patients, 46 were placed on prophylactic antiepileptic drugs. The primary outcome measure was the rate of early seizure activity, defined as that which occurred within seven days of ICH onset. Secondary outcome measures included rates of epilepsy, disability or death.

Of the 157 patients, 12 developed early seizures, five of whom were in the group receiving PAEDs. While 11% of those taking PAEDs and 6.3% of those not taking these drugs developed an early seizure, this difference did not reach statistical significance ( $p = 0.34$ ). Death or hospice discharge was less common in patients prescribed PAEDs, while length of stay was longer in those taking PAEDs. These differences were not however statistically different.

**Conclusion:** This study of patients with spontaneous intracranial hemorrhage did not find a significant difference in the rate of seizures between those who took prophylactic

antiepileptic drugs and those who did not.

Reddig, R., et al. Prophylactic Use of an Antiepileptic Drugs in Intracerebral Hemorrhage. *Clin Neurosurg*. 2011 DLI: 10. 1016/J.Clineuro.2011.07.008.

### LONG-TERM OUTCOME OF PCA STROKE

Posterior cerebral artery (PCA) strokes represent five to ten percent of all ischemic strokes. Little data are available concerning long-term mortality and risk of recurrence in patients with these strokes. This study reported on the 10-year outcomes of patients with PCA stroke.

This study included consecutive patients with PCA strokes registered in the Athens Stroke Outcome Project (ASOP) between 1998 and 2009. The ASOP is a prospective registry of all consecutive patients with stroke admitted to the Department of Clinical Therapeutics at the Alexandra Hospital in Athens, Greece. The subjects were divided into four categories, based upon territorial distribution. These groups were (A) cortical only PCA (53%), (B) cortical and deep, including thalamus and midbrain (13%), (C) cortical PCA infarcts with coincident infarcts in the PCA (19.5%) and (D) cortical and deep PCA infarcts with coincident infarcts outside the posterior circulation (14.6%). The patients were assessed at one, three and six months after stroke, and then yearly for up to 10 years, either by office visit or by telephone interview.

A total of 2,270 patients with acute, first-ever ischemic stroke were registered, with 28.2% involving the posterior circulation. The mean follow-up period was 49.6 months. At six months, 56% of patients with cortical only PCA stroke had a favorable functional outcome, compared to 37%, 36% and 26% in groups B, C and D, respectively. The probability of 10-year mortality was significantly lower in group A (55.1%) than in the other three groups (72.5%) ( $p < 0.001$ ). The ten-year probabilities of recurrence was not significantly different between the groups.

**Conclusion:** This study found that patients with pure PCA strokes are at significantly lower risk of disability and mortality than are those

with PCA strokes with coincident infarcts outside the PCA territory.

Ntaios, G., et al. Long-Term Outcome in Posterior Cerebral Artery Stroke. **Europ J Neuro.** 2011, August; 18(8): 1074-1080.

### **MAGNETIC STIMULATION IMPROVES BLADDER DYSFUNCTION**

Neuromodulation through sacral nerve stimulation is a relatively new and promising treatment for intractable bowel and bladder incontinence. Repetitive high-frequency lumbosacral magnetic stimulation (LMS) has been found to change cortico-anal excitability in healthy subjects. This study investigated whether high-frequency repetitive and consecutive magnetic stimulation can improve urinary disturbances associated with lumbosacral plexopathy.

Subjects included patients with symptoms suggesting overactive bladder with lower urinary tract dysfunction secondary to lumbosacral plexopathy (LUTS), as documented by magnetic resonance imaging (MRI). A total of 33 subjects were evaluated, with 26 chosen for study participation. All patients were referred for standard treatment, including anticholinergic medication and behavioral intervention. The participants were randomized to receive either real or sham LMS at 15 Hz with a total of 1,500 pulses per session for 10 sessions. The patients were assessed at baseline and immediately after the fifth and 10th treatments, as well as at one month post-treatment. The primary outcome measures were urinary dysfunction and scores on a visual analogue scale to assess low back pain.

All patients had evidence of lower motor neuron lesions due to injury of the lumbosacral roots. The frequency of incontinence per 24 hours was found to improve more in the treatment group than in the sham group, with this finding remaining significant at one month follow-up. In addition, scores on a visual analogue scale for low back pain improved more in the treatment group than in the sham group. Electrodiagnostic studies demonstrated that the mean values of F-wave and H-reflex latencies improved after real stimulation, with no such

improvement noted with sham stimulation.

**Conclusion:** This study found that repetitive lumbosacral nerve magnetic stimulation can improve urinary dysfunction secondary to lumbosacral nerve injury.

Khedr, E., et al. Repetitive Lumbosacral Nerve Magnetic Stimulation Improves Bladder Dysfunction Due to Lumbosacral Nerve Injury: A Pilot, Randomized, Controlled Study. **Neurorehab Neural Repair.** 2011, July/Aug; 25 (6): 570-576.

### **HARMFUL EFFECTS OF NSAIDS AMONG PATIENTS WITH HYPERTENSION AND CORONARY ARTERY DISEASE**

Clinical trials have demonstrated that selective cyclooxygenase-2 inhibitors increase the risk of myocardial infarction. This finding has led to the more frequent use of nonselective nonsteroidal anti-inflammatory drugs (NSAIDs). However, data are scarce concerning possible harmful effects of chronic NSAIDs in patients with hypertension and coronary artery disease. This study explored the associations among chronic NSAID use, blood pressure and adverse cardiovascular outcomes among hypertensive patients with coronary artery disease.

This study retrieved data from the International Verapamil Trandolapril Study (INVEST), an international, randomized trial that compared the effects of a calcium antagonist-based strategy with a beta blocker-based strategy for hypertension among patients with stable coronary artery disease. The subjects were 50 years of age or older, all with hypertension and clinically stable coronary artery disease. At baseline and at every follow-up visit, the patients were asked whether they were using a NSAID, and were then further classified as either chronic or non-chronic users. Follow-up visits occurred every six weeks for the first six months, and then biannually until two years after the last patient was enrolled. The primary outcome measure was the first occurrence of all-cause mortality, nonfatal myocardial infarction or nonfatal stroke.

Data revealed 882 chronic and 21,694 non-chronic users of NSAIDs.

The subjects were followed for a mean of 2.7 years. For chronic users, the mean systolic and diastolic blood pressure levels were lower during follow-up than for the acute users. The primary outcome occurred at a rate of 4.4 events per 100 patient-years for chronic NSAID users, and at 3.7 events per 100 patient-years for nonchronic NSAID users ( $p=0.0003$ ). In addition, the rate of cardiovascular mortality was significantly increased among the chronic users ( $p<0.0001$ ). Compared with no history of use, chronic NSAID use was associated with harm ( $p=0.018$ ), while intermittent use was not.

**Conclusion:** This study of patients with hypertension and stable coronary artery disease found that the chronic use of NSAIDs is associated with adverse events, including cardiovascular mortality.

Bavry, A., et al. Harmful Effects of NSAIDs among Patients with Hypertension and Coronary Artery Disease. **Am J Med.** 2011, July; 124 (7): 614-620.

### **EFFICACY OF A TRAMADOL/ ACETAMINOPHEN COMBINATION FOR KNEE OSTEOARTHRITIS**

Osteoarthritis (OA) affects various joints, including the hands, feet, spine and hips, while the knee joint is the most commonly affected. Pain due to knee OA decreases mobility and leads to various complications. Acetaminophen has been reported to be safe and effective as a first-line analgesic. This study compared the efficacy of tramadol/acetaminophen with that of nonsteroidal anti-inflammatory drugs (NSAIDs) for the treatment of knee pain.

This randomized, multi-centered study included subjects with knee OA, symptomatic for more than one year. All experienced moderate pain, despite treatment with stable doses of NSAIDs. All patients maintained their existing NSAID dose and added tramadol/acetaminophen, titrated from two to eight tablets per day. On day 29, patients with reduced pain were randomized to continue either tramadol/acetaminophen or NSAIDs for a further eight weeks. Efficacy evaluations were performed on days 29 and 57 during monotherapy. The primary efficacy measure was the WOMAC OA Index score, with secondary outcome measures

including pain intensity on the Numerical Rating Scale (NRS), pain relief scores and overall medication assessments.

Of the 143 subjects, 112 completed four-week combination therapy. Of those, 67.8% experienced significant pain relief and significant improvement on the WOMAC index for amount of pain, stiffness, physical function, total WOMAC scores. The WOMAC scores and NRS measures in both tramadol/acetaminophen and NSAID group did not significantly increase on days 29 and 57 of monotherapy as compared to the measurements immediately after the end of tramadol/acetaminophen and NSAID combination therapy.

**Conclusion:** This study of patients with OA of the knee, each of whom had been refractory to NSAID therapy, found reduced pain and increased function by adding tramadol/acetaminophen for one month, which could then be maintained by NSAID monotherapy.

Park, K., et al. The Efficacy of Tramadol/Acetaminophen Combination Tablets (Ultracet) as Add-On and Maintenance Therapy in Knee Osteoarthritis Pain Inadequately Controlled by Nonsteroidal Anti-Inflammatory Drugs (NSAIDs). *Clin Rheum.* 2001;DOI 10.1007/s10067-011-1818-y.

### PROBLEMATIC OPIOID USE IN NEW USERS OF WEAK OPIOIDS

Patients taking short-acting, weak opioid treatment for chronic, non-malignant pain are often perceived to be at risk for developing problematic opioid use. This study reviewed a cohort of new users of weak opioid treatments to determine prescription patterns indicative of persistent usage, risk of developing problematic usage and differences in prescription patterns among weak opioids.

Data were obtained from the Norwegian Prescription Database, which covers the entire Norwegian population. The sample included all patients receiving prescriptions for weak opioids, including codeine, tramadol or dextropropoxyphene, in the year 2005. The cohort was followed through the year 2008. Patients were considered to have problematic use if they received opioids once every year and were dispensed more than 365 daily doses

of opioid, received opioid prescriptions from more than three doctors or were dispensed more than 100 daily doses of benzodiazepines.

Identified were 245,006 new users of opioids, including 216,906 prescribed codeine, 26,326 prescribed tramadol and 1778 prescribed dextropropoxyphene. Of the new users, seven percent received opioids each year between 2005 and 2008. In 2008, 0.3% of new users received 365 defined daily doses. At study end, 0.08% were defined as problematic opioid users. Of those repeat users who started with codeine, 90% continued with this medication. Forty percent of repeat users who started with tramadol switched to other medications or combined opioids.

**Conclusion:** This study found that, among patients newly prescribed weak opioids, few developed abuse or addiction.

Skurtveit, S., et al. To What Extent Does a Cohort of New Users of Weak Opioids Develop Persistent or Probable Problematic Opioid Use? *Pain.* 2011, July; 152(7): 1555-1561.

### AEROBIC EXERCISE AND WEIGHT LOSS

The obesity epidemic in North America has worsened over the past several decades, with an estimated 32.5% of the population being overweight and 33.8% being obese. Obesity contributes to an estimated 120,000 preventable deaths in North America each year. Many studies have shown that consistent exercise, in combination with a calorie controlled diet, can reduce obesity. However, few studies examined the benefits of isolated aerobic exercise in this population. This study reviewed the current literature in order to determine the effect of isolated aerobic exercise on weight loss, blood pressure and cholesterol. The authors conducted a literature search, reviewing all randomized, controlled trials (RCT) published in the last 30 years, involving exercise as the experimental intervention for weight loss. These trials included studies that had a moderate exercise regimen of longer than 12 weeks' duration, with at least 120 minutes of exercise per week. A total of eight studies were identified. The difference between the mean change

in the experimental group and the control group was calculated for each RCT.

The studies were divided into three groups, based upon the length of the exercise program. Two studies involved 12-month interventions, four involved six-month interventions and eight involved 12- to 16-week interventions. The six- and 12-month programs were associated with a modest decrease in weight (1.6 kg. and 1.7 kg., respectively). All studies reported modest reductions in systolic and diastolic blood pressure, with four of six studies demonstrating improvement in cholesterol.

**Conclusion:** This literature review of randomized, controlled trials found that isolated, moderate intensity aerobic exercise tends to result in only modest reductions in weight and cardiovascular risk factors.

Thorogood, A., et al. Isolated Aerobic Exercise and Weight Loss: A Systematic Review and Meta-Analysis of Randomized, Controlled Trials. *Am J Med.* 2011, August; 124 (8): 747-755.

### OPTIMAL PATIENT POSITIONING FOR SHOCK WAVE TREATMENT OF CALCIFYING TENDINITIS OF THE SHOULDER

Calcifying tendinitis is a common, often painful shoulder disorder. Extracorporeal shock wave therapy has been found effective for treatment of this disorder. This study was designed to determine the optimal shoulder position for the delivery of this intervention.

This randomized, single-blind study included 35 subjects with painful calcifying tendinitis of the shoulder. After randomization, each subject underwent a total of three sessions of extracorporeal shockwave therapy (one session per week), with each session consisting of 1,800 pulses, delivered at an energy density of up to 0.22 mJ/mm<sup>2</sup>.

The patients were randomized to receive therapy from one of two positions. Those in the neutral group received the treatment with the shoulder in neutral and the hand on the abdomen. Those in the internal rotation group lay supine, with the affected shoulder in hyperextension and internal rotation, with the hand placed under the buttock of the same

side. The two groups were compared by radiographs. Symptom relief was measured with the Constant Murley shoulder score. The evaluations were completed before extracorporeal shockwave therapy and at three months post-treatment.

At follow-up, 35.3% of the neutral, and 66.6% of the internally rotated, group demonstrated subtotal or total resorption of the calcifying deposit. In addition, pain scores favored the internal rotation group. Constant Murley scores did not differ significantly between the two groups.

**Conclusion:** This study of patients with calcifying tendinitis of the shoulder demonstrates that, during the delivery of extracorporeal shockwave therapy, placing the shoulder in hyperextension and internal rotation may result in increased resorption of calcium deposits and better pain relief than does treatment from a neutral position.

Tornese, D., et al. Arm Position during Extracorporeal Shock Wave Therapy for Calcify Tendinitis of the Shoulder: A Randomized Study. *Clin Rehab*. 2011, August; 25(8): 731-739.

#### LITIGATION STATUS AND PROLOTHERAPY RESPONSE

Prolotherapy involves injection of tender ligaments and entheses to induce inflammation, followed by the deposition of collagen fibers. As four of the five randomized, controlled trials identified by the authors of this study excluded patients involved in litigation, this study investigated the effect of ongoing litigation on patients' responses to dextrose prolotherapy.

This study included 260 patients referred for chronic cervical, thoracic or lumbar pain of at least six months' duration who had not responded to conservative interventions. Participants were classified as litigants or non-litigants. Treatment involved weekly dextrose prolotherapy, using a solution of 20% dextrose and 0.75% lidocaine at areas identified by palpation. Injections were given on a weekly basis for up to three weeks, with repeated injections one month later if symptoms persisted. Participants were measured for disability outcomes using the Roland-Morris Disability Questionnaire a Patient

Specific Functional Scale and the Neck Disability Index.

Of the 147 participants, 75% were female, with a median symptom duration of 2.5 years. Seventy-one of the participants were litigants and 76 were non-litigants. Litigants had higher pretreatment disability scores ( $p=0.001$ ), with more multiple regions affected, more cervical and thoracic regions affected ( $p<0.0001$ ) and a shorter mean duration of symptoms ( $p<0.0001$ ). Litigants showed significantly greater improvement with treatment in the thoracic spine ( $p<0.05$ ). Both groups with lumbar spine disability improved after treatment, with no significant difference between the two groups. The low number of cervical non-litigants limited statistical comparison between those groups.

**Conclusion:** This study of patients receiving prolotherapy for chronic spinal pain found that ongoing litigation did not seem to suppress their response to the treatment.

Hooper, R., et al. Prospective Case Series of Litigants and Non-Litigants with Chronic Spinal Pain Treated with Dextrose Prolotherapy. *Intern Musculoskeletal Med*. 2011, March; 43(1): 15-20.

#### PREDICTORS OF RADIOGRAPHIC SACROILIITIS PROGRESSION

Sacroiliitis is the initial sequela of axial spondyloarthritis. Little data exist concerning the rate and predictors associated with radiographic progression of sacroiliitis associated with this disease. This study assessed the progression of radiographic sacroiliitis among patients with early axial spondyloarthritis.

This study included 210 patients with axial spondyloarthritis. Of these, 115 were diagnosed with ankylosing spondylitis (AS) and 95 with non-radiographic axial spondyloarthritis. All subjects underwent baseline and two-year follow-up x-rays. These x-rays were graded for sacroiliitis from 0 to 4, with the rate of progression quantified over two years.

At baseline, 55% of the patients fulfilled the criteria for AS, with 45% classified as having non-radiographic axial spondyloarthritis. At two-year follow-up, more of the patients with non-radiographic spondyloarthritis

than with AS demonstrated a progression by at least one grade. The rate of progression was 11.6% over the two years of the study. Of the baseline data, C-reactive protein was a strong predictor of progression in those with non-radiographic axial spondyloarthritis and AS.

**Conclusion:** This study found the rate of progression from non-radiographic axial spondyloarthritis to ankylosing spondylitis to be 10% over two years. An elevated C-reactive protein at baseline was associated with this progression.

Poddubnyy, D., et al. Rates And Predictors of Radiographic Sacroiliitis Progression over Two Years in Patients with Axial Spondyloarthritis. *Ann Rheum Dis*. 2011, August; 70 (8): 1369-1374.

#### TRUNK BALANCE EXERCISES FOR CHRONIC LOW BACK PAIN

Chronic low back pain (LBP) is among the most common musculoskeletal conditions in Europe and the United States. In Italy, it is the leading cause of absenteeism from work and the second most frequent cause of permanent disability. A consistent finding among those with chronic LBP is delayed activation of the trunk muscles during both unpredicted and predicted trunk perturbations. Previous studies have demonstrated that motor control exercises may be useful for the treatment of LBP, although the efficacy of trunk balance exercise training alone has never been studied. This study was designed to determine the efficacy of trunk balance exercises in patients with chronic LBP.

Seventy-nine ambulatory patients with chronic LBP were randomized to either a control group or experimental group. During 10, one-hour therapy sessions, participants performed 15 minutes of walking and 30 minutes of stability exercises. The control group performed another 15 minutes of limb strengthening while the experimental group performed 15 minutes of trunk balance exercises. The primary outcome measures included a visual analogue scale for pain disability as measured by the Roland-Morris disability questionnaire, and quality of life as measured by the 12 item Short-Form Survey.

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At follow-up, the decreases in pain intensity did not differ significantly between the two groups. Both groups realized significant improvements in disability scores, while the treatment group improved significantly better than did the control group ( $p=0.011$ ). The improvement in disability scores reached the minimally clinically important difference for 19 participants in the experimental group and 14 in the control group ( $p=0.04$ ). More participants in the experimental group enjoyed improvement in their painful positions than did those in the control group, with a relative risk of 1.37. The changes in medications and changes in pain did not significantly differ between the groups.

**Conclusion:** This study of patients with chronic low back pain found that trunk balance exercises may be effective in reducing disability.

Gatti, R., et al. Efficacy of Trunk Balance Exercises for Individuals with Chronic Low Back Pain: A Randomized Clinical Trial. *J Ortho Sport Phys Ther.* 2011, August; 41 (8): 542-552.

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